

## **IBM Tivoli Storage Manager Version 5.3 Technical Guide**



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IBM Tivoli Storage Manager Version 5.3 Technical Guide

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**Note:** Before using this information and the product it supports, read the information in "Notices" on page xxv.

#### First Edition (March 2005)

This edition applies to IBM Tivoli Storage Manager, Version 5.3.0.

**Note:** This book is based on a pre-GA version of a product and may not apply when the product becomes generally available. We recommend that you consult the product documentation or follow-on versions of this redbook for more current information.

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### Preface

This IBM® Redbook presents an overview of IBM Tivoli® Storage Manager Version 5.3, giving detailed descriptions of the changes provided in this new release. This Redbook also covers the cumulative changes in the releases after version 5.1.

This book is intended for customers, consultants, IBM Business Partners, IBM and Tivoli staff who are familiar with earlier releases of Tivoli Storage Manager and who want to understand what is new in Version 5.3. It should be used in conjunction with the manuals and readme files provided with the products and is not intended to replace any information contained therein.

This redbook is the latest in a series of Technical Guides for the IBM Tivoli Storage Manager. The books previously published have been:

- ADSM Version 3 Technical Guide, SG24-2236-01, published 9 December 1998
- Tivoli Storage Manager Version 3.7: Technical Guide, SG24-5477-00, published 26 December 1999, last updated 27 March 2000
- Tivoli Storage Manager Version 3.7.3 & 4.1: Technical Guide, SG24-6110-00, published 29 September 2000
- Tivoli Storage Manager Version 4.2 Technical Guide, SG24-6277-00, published 31 January 2002
- Tivoli Storage Manager Version 5.1 Technical Guide, SG24-6554-00, published 20 June 2002

**Note:** The IBM Tivoli Storage Manager documentation carries the same version number 5.2 for both the 5.2 and 5.2.2 versions of the software product. Make sure you look at the release date of the publication on the first pages. The *IBM Tivoli Storage Manager Administrator's Guide 5.2/5.2.2* have been published June 2003/January 2004.

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## Part 1

## **Overview**

This part of the book gives a basic introduction to the new features provided with IBM Tivoli Storage Manager V5.3. It also provides an overview of the improvements incorporated in previous versions (5.1.5/5.2/5.2.2), not covered since the last Technical Guide.

Server and client specific features are covered in more detail in later chapters.

New functions or processes are covered in more depth in the Appendixes.



# 1

## IBM Tivoli Storage Manager overview

This chapter contains an overview of the new functionality and changes that come with the latest Version 5.3 of the IBM Tivoli Storage Manager, as well as the cumulative changes in the releases after Version 5.1.

In this chapter we provide information on the following major areas of change:

- Overview of enhancements, additions, and changes:
  - Server enhancements, additions, and changes
  - Client enhancements, additions, and changes
  - IBM Tivoli Storage Manager for Products

#### 1.1 Overview

As part of the IBM TotalStorage® Open Software Family, IBM Tivoli Storage Manager protects data from hardware failures, errors, and unforeseen disasters by storing backup and archive copies on offline and offsite storage. Scaling to protect hundreds to thousands of computers running more than a dozen operating systems, ranging from laptops to mainframes and connected together via the Internet, WANs, LANs or SANs, Storage Manager Extended Edition's centralized Web-based management, intelligent data move and store techniques, and comprehensive policy based automation all work together to minimize administration costs and the impact to both computers and networks.

Optional software modules allow business-critical applications that must run 24x365 to utilize Storage Manager's centralized data protection with no interruption to their service. Optional software extensions also allow SAN connected computers to use the SAN for data protection data movements, and provide Hierarchical Storage Management to automatically move unused data files from online disk storage to offline tape storage. Storage Manager Extended Edition expands on the data backup and restore, and managed data archive and retrieve capabilities of the base Storage Manager by adding, disaster planning capability, NDMP control for NAS filers, and support for large tape libraries.

Figure 1-1 shows the interrelation of the components in IBM Tivoli Storage Manager Version 5.3.



Figure 1-1 How the product components interrelate in version 5.3
**Note:** The Tivoli Storage Manager Server and the Administration Center can be installed on the same machine. The Administration Center requires a minimum of 512 MB RAM in addition to the RAM required for the Tivoli Storage Manager Server.

For the latest recommendations on Administration Center installation, use keyword TSMADMINCENTER when you visit:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

#### 1.1.1 Disaster preparation and recovery

Local copies of data will not protect against a local disaster. IBM Tivoli Storage Manager Extended Edition facilitates the tracking of the additional copies of your active data that IBM Tivoli Storage Manager creates for safekeeping at an off site location. This is known as the Disaster Recovery Manager. IBM Tivoli Storage Manager Extended Edition prepares and keeps up to date a text file, the "recovery plan", which contains detailed recovery steps and automated scripts to recover your server. Should a disaster strike and destroy your storage and computers, this plan and the off site data copies will get your business back up and running quickly.

#### 1.2 Product positioning

IBM Tivoli Storage Manager and its complementary products provide a comprehensive solution focused on the key data protection activities of backup, archive, recovery, space management, and disaster recovery planning.

IBM Tivoli Storage Manager helps ensure recoverability through the automated creation, tracking, and vaulting of reliable recovery points.

IBM Tivoli Storage Manager Extended Edition provides the following support:

- Disaster Recovery Manager
- NDMP (for selected network attached storage devices)
- Large tape libraries (greater than 3 drives or 40 slots)
- IBM Tivoli Storage Manager (for basic backup-archive using a tape library with up to 3 drives and 40 slots).

IBM Tivoli Storage Manager for Storage Area Networks and IBM Tivoli Storage Manager for Space Management can be used with either IBM Tivoli Storage Manager and IBM Tivoli Storage Manager Extended Edition.

#### 1.3 Overview of the development timeline

IBM Tivoli Storage Manager started life as ADSM (ADSTAR Distributed Storage Manager). Figure 1-2 illustrates the changes to ADSM to become IBM Tivoli Storage Manager over its lifetime.



Figure 1-2 IBM Tivoli Storage Manager overall product progression

#### 1.4 New features overview

IBM Tivoli Storage Manager helps you evolve into an On Demand storage environment in order to deliver specific results in the areas of:

- Improved application availability:
  - IBM Tivoli Storage Manager for Space Management: HSM for AIX® JFS2, enhancements to HSM for AIX and Linux GPFS
  - IBM Tivoli Storage Manager for application products update

- Optimized storage resource utilization:
  - Improved device management, SAN attached device dynamic mapping, native STK ACSLS drive sharing and LAN-free operations, improved tape checkin and checkout, and label operations, and new device support
  - Disk storage pool enhancements, collocation groups, proxy node support, improved defaults, reduced LAN-free CPU utilization, parallel reclamation and migration
- Enhanced storage personnel productivity:
  - New Administrator Web GUI
  - Task-oriented interface with wizards to simplify tasks such as scheduling, managing server maintenance operations (storage pool backup, migration, reclamation), and configuring devices
  - Health monitor which shows status of scheduled events, the database and recovery log, storage devices, and activity log messages
  - Calendar-based scheduling for increased flexibility of client and administrative schedules
  - Operational customization for increased ability to control and schedule server operations

IBM Tivoli Storage Manager V5.3 is designed to provide significant improvements to the ease of use and ease of administration and serviceability characteristics. These enhancements help you improve the productivity of personnel administering and using IBM Tivoli Storage Manager. Additionally, the product is easier to use for new administrators and users.

#### 1.4.1 Server enhancements, additions, and changes

This section lists all the functional enhancements, additions, and changes for the IBM Tivoli Storage Manager Server introduced after version 5.1.

**Note:** For a list of the enhancements introduced with each version and the availability on specific platforms see Appendix F, "Tables of the changes and enhancements by versions" on page 383

#### IBM Tivoli Storage Manager Version 5.1.5

There are several operating platform improvements.

#### **IBM Tivoli Storage Manager Version 5.2**

Changes between Version 5.1 and Version 5.2 are listed here:

- Accurate SAN device mapping
- Device driver for Windows Server 2003
- IBM device driver for 3570, 3590, and IBM LTO devices
- Increased archive retention limits
- ► LAN-free data movement for z/OS®
- Licensing changes
- Linux for pSeries®
- Linux for zSeries
- Macintosh OS X unicode support for backup-archive client
- Move data by node
- Product packaging and name changes
  - DRM part of IBM Tivoli Storage Manager EE
  - TDP now Application Client
  - TDP for NDMP in EE
  - Tivoli Space Manager now HSM
  - Tivoli Storage Manager for SAN product now includes LAN-free data movement
- Server Performance Tuning TXNGROUPMAX
- Server to server export and import
- Security firewall support
- StorageTek VolSafe support
- Support for SCSI libraries with multiple drive types
- Support for simultaneous writes to primary and copy storage pools
- Tape alert device support
- ► Tape autolabeling

#### IBM Tivoli Storage Manager Version 5.2.2

Changes between Version 5.2 and Version 5.2.2 are listed here:

Disaster Recovery Manager for Linux

- DVD support
- EMC Centera support
- IBM 3592 support
- IBM Tivoli Storage Manager for data retention
  - Data retention protection
  - Event-based retention policy
  - Deletion hold
- ► LAN-free data movement for z/OS
- NDMP operations
  - IBM 3494 library support
  - File level restore
  - EMC Celerra NAS device support
- Operational Reporting
- Sony AIT50 and AIT100 WORM media support

#### **IBM Tivoli Storage Manager Version 5.3**

The latest changes are listed here:

- ACSLS library support enhancements
- Accurate SAN device mapping for UNIX servers
- ACSLS library support enhancements
- Activity Log management
- Check-in and check-out enhancements
- Collocation by group
- Communications options
- Database reorganization
- Disk-only backup
- ► Enhancements for server migration and reclamation processes
- IBM 3592 WORM support
- Improved defaults
- Increased block size for writing to tape
- ► LAN-free environment configuration
- NDMP operations
- Net Appliance SnapLock support

- ► New interface to manage servers: Administration Center
- Server processing control in scripts
- Simultaneous write inheritance improvements
- Space triggers for mirrored volumes
- Storage Agent and library sharing failover
- Support for Multiple IBM Tivoli Storage Manager client nodes
- ► IBM Tivoli Storage Manager scheduling flexibility

#### 1.4.2 Client enhancements, additions and changes

This chapter lists all the functional enhancements, additions and changes for the IBM Tivoli Storage Manager Backup Archive Client introduced after version 5.1.

**Note:** For a list of the enhancements introduced with each version and the availability on specific platforms see Appendix F, "Tables of the changes and enhancements by versions" on page 383

#### IBM Tivoli Storage Manager Version 5.1.5

Changes between Version 5.1 and Version 5.1.5 are listed here:

- New backup-archive option to preserve last access date of files
- Enhanced domain processing
- ► 64-bit support for the Storage Manager HP-UX client
- Support for a globally unique identifier (GUID)
- Enhanced query backup and query archive commands
- Linux86 client support for the General Parallel File System (GPFS)
- Lan-free data movement support on linux86 client
- STORAGE AGENT 5.1 (October 2002) for Linux
- Support for excluding specific system objects from backup processing
- Ignore NTFS compression attribute
- Enhanced image backup and restore processing (Windows 2000 only)
- Support for DBCS installation path on Unicode-enabled clients
- Support for Novell Cluster Services
- Enhanced domain processing
- ► Enhanced query backup and query archive commands

No changes introduced in 5.1.5 to the Mac OS X

#### IBM Tivoli Storage Manager Version 5.2

Changes between Version 5.1.5 and Version 5.2 are listed here:

- Support for backing up files from one or more file space origins
- Support for an external snapshot provider in the backup-archive clients
- Enhancements to the Web client interface
- Enhanced firewall security
- Support for displaying options and their settings via the command line
- NDMP file-level restore
- Support for processing EMC Celerra Network Attached Storage (NAS) file system images
- Support for backup and restore of the WebSphere® Application Server (WAS)
- ► Enhancements for command line image restore operations
- Support for gathering IBM Tivoli Storage Manager system information
- ► Enhancements for the query filespace command
- Separately installable language packs available
- Veritas file systems, ACLs, and Veritas Volume Manager support on AIX (32-bit and 64-bit) clients
- Automounter support for Linux86 and Linux390 clients
- Open file support for backup and archive operations on Windows 2000 and Windows XP
- Support for Microsoft Volume Shadowcopy Service (VSS) on Windows Server 2003
- Support for Microsoft Automated System Recovery (ASR) on Windows Server 2003 and Windows XP
- IBM Tivoli Storage Manager command line and GUI display actual image size stored on IBM Tivoli Storage Manager server
- Enhanced ALL-LOCAL domain processing (NDS replica)
- Migrating to the Unicode-enabled client
- Considerations for Unicode-enabled clients
- Inclexcl
- ► Autofsrename

#### IBM Tivoli Storage Manager Version 5.2.2

Changes between Version 5.2 and Version 5.2.2 are listed here:

- Removal of operand limits for backup and archive operations
- Multi-session backup session enhancements
- Support for WebSphere Application Server (WAS) security
- Language support expanded to include Russian, Hungarian, Polish, and Czech
- Support for controlling symbolic link processing
- Backup and restore support for IBM TotalStorage SAN File System
- ► IBM Tivoli Storage Manager backup-archive client Linux on iSeries<sup>™</sup>
- ► IBM Tivoli Storage Manager backup-archive client for Linux on Intel® Itanium
- Support for Veritas Cluster Server cluster environment
- Backup and restore support for IBM TotalStorage SAN File System (Windows 2000 Client)
- Multi-session backup session enhancements
- Support for Novell NetWare 6.5 operating system
- Enhanced firewall security
- Support for encrypting data during backup or archive operation
- Support for displaying options and their settings via the command line for Mac OS X (available since 5.1.5 for all others)
- Support for gathering IBM Tivoli Storage Manager system information for Mac OS X (available since 5.1.5 for all others)
- Support for an IBM Tivoli Storage Manager command line interface for Mac OS X
- Support for IBM Tivoli Storage Manager as a background scheduler for Mac OS X
- Support for non-administrators to use
- IBM Tivoli Storage Manager to manage their own data for Mac OS X
- Support for a IBM Tivoli Storage Manager administrative client for Mac OS X
- Support for controlling symbolic link and alias processing for Mac OS X

#### IBM Tivoli Storage Manager Version 5.3

The latest Changes are listed here:

- Include-exclude enhancements
- ► Enhancements to query schedule command
- ► IBM Tivoli Storage Manager Administration Center
- Support for deleting individual backups from a server file space
- Optimized option default values
- ► New links from the backup-archive client Java<sup>™</sup> GUI to the IBM Tivoli Storage Manager and Tivoli Home Pages
- New options, Errorlogmax and Schedlogmax, and DSM\_LOG environment variable changes
- Enhanced encryption
- Dynamic client tracing
- Web client enhancements
- Client node proxy support (asnodename)
- Java GUI and Web client enhancements
- IBM Tivoli Storage Manager backup-archive client for HP-UX Itanium 2
- Linux for zSeries® offline image backup
- Journal based backup enhancements
- Single drive support for Open File Support (OFS) or online image backups



## 2

# IBM Tivoli Storage Manager for products

This chapter gives a brief description of the changes in the IBM Tivoli Storage Manager for Mail, Databases, Hardware, Application Servers, and Enterprise Resource Planning (ERP), which appeared since the versions documented in earlier redbooks.

**Tip:** Be aware that failure to register licenses for IBM Tivoli Storage Manager for products can lead to unusual client behavior which can often be resolved by registering the relevant license.

For a short functional overview of how these products work, please refer to Chapter 5, "Storage Management", in the IBM Redbook: *Understanding the IBM TotalStorage Open Software Family*, SG24-7089-00, available at:

http://www.redbooks.ibm.com/abstracts/sg247098.html?Open

#### 2.1 IBM Tivoli Storage Manager for Mail

Data Protection for Domino® is an application that backs up and restores Lotus® Domino databases and transaction logs. When archival logging is used on the Domino Server, it archives transaction log files and retrieves them as required for database recovery.

Data Protection for Exchange performs online backups and restores of Microsoft Exchange Server storage groups. You can perform backups and restores using a command line interface (CLI) or graphical user interface (GUI) on a Windows NT®, Windows 2000, or Windows 2003 system.

The following sections summarize the changes for IBM Tivoli Storage Manager for Mail, which is divided into Data Protection for Lotus Domino and Data Protection for Microsoft Exchange.

#### 2.1.1 Data Protection for Lotus Domino

Here are the changes and improvements for Data Protection for Lotus Domino:

- Data Protection for Domino supports Domino 6 and the alternate restore path feature for transaction logs in a Domino 6 environment.
- The resetdatabase command resets a Domino server database that is in an incomplete state as a result of an unexpected termination during a Data Protection for Domino backup.
- The statistics option provides backup and restore information to assist in performance measurement. This option is specified in the Data Protection for Domino preferences file (domdsm.cfg).
- Remote Web access You can access Data Protection for Domino remotely using the IBM Tivoli Storage Manager Web client. This feature is available on Windows, AIX, Linux 86, Linux on 390, Solaris, and z/OS(R) only.
- Quick Start A quick start procedure is available to assist in setting up your Data Protection for Domino environment.
- Best Practices Recommended tips and hints regarding Data Protection for Domino processing are available in a new chapter.
- Frequently Asked Questions Answers to frequently asked questions regarding Data Protection for Domino processing are available in a new appendix.

#### 2.1.2 Data Protection for Lotus Domino for Windows

Here are the changes and improvements for Data Protection for Lotus Domino for Windows:

- Language option The language option specifies locale information for your environment. This option is specified in the Data Protection for Domino preferences file(domdsm.cfg)
- Enhanced GUI Query Filter The By Database Name GUI query filter reduces processing time when querying the IBM Tivoli Storage Manager server for databases to restore.

#### 2.1.3 Data Protection for Lotus Domino for UNIX, Linux, and OS/400

Here are the changes and improvements for Data Protection for Lotus Domino for UNIX, Linux, and OS/400®:

- Data Protection for Domino supports Domino 6 and the alternate restore path feature for transaction logs in a Domino 6 environment
- Data Protection for Domino provides a new dominstall program. This program automatically configures Data Protection for Domino to operate within your desired Domino environment and replaces the domsetup script provided in earlier releases of Data Protection for Domino. The dominstall program also supports multiple Domino server partitions.
- The resetdatabase command resets a Domino server database that is in an incomplete state as a result of an unexpected termination during a Data Protection for Domino backup.
- The statistics option provides backup and restore information to assist in performance measurement. This option is specified in the Data Protection for Domino preferences file (domdsm.cfg).
- ► Data Protection for Domino supports the Linux operating system.
- OS/400 users The IBM Tivoli Storage Manager for Mail 5.1.5 version of DataProtection for Domino contains the Version 1.1.2 level release of Data Protection for Domino on OS/400. Only the product name has changed. All technical requirements and functionality are at the Version 1.1.2 level.
- The OS/400 operating system supports the **dominstall** program and no longer requires running the **domsetup** script.
- The OS/400 operating system uses the Version 5.2.0 level of the IBM Tivoli Storage Manager API.
- Remote Web access You can access Data Protection for Domino remotely using the IBM Tivoli Storage Manager Web client. This feature is available on AIX, Linux. 86, Linux on 390, Solaris, and z/OS only.

- Quick Start A quick start procedure is available to assist in setting up your Data Protection for Domino environment
- Best Practices Recommended tips and hints regarding Data Protection for Domino processing are available in a new chapter
- Frequently Asked Questions Answers to frequently asked questions regarding Data Protection for Domino processing are available in a new appendix.

#### 2.1.4 Data Protection for Microsoft Exchange Server

Here are the changes and improvements for Data Protection for Microsoft Exchange Server:

- The language option specifies locale information for your environment. This option is specified in the Data Protection for Exchange preferences file(tdpexc.cfg).
- Data Protection for Exchange supports back up and restore of Exchange 2000 Server Key Management Service (KMS) and Site Replication Service (SRS) databases from the Data Protection for Exchange graphical user interface (GUI).
- Data Protection for Exchange provides information on how to perform brick-level backup and restores of your Microsoft Exchange Server. See the BRICKBACK.DOC file in the Data Protection for Exchange installation directory for more information.
- Support is provided for:
  - Exchange Server 2003
  - Exchange Server 2003 Recovery Storage Group
  - Windows Server 2003
- Separately installed Language Packs are available.
- A new quick start procedure is available to assist in setting up your DataProtection for Exchange environment.

#### 2.2 IBM Tivoli Storage Manager for Databases

IBM Tivoli Storage Manager for Databases performs online or offline backups of databases to IBM Tivoli Storage Manager. This integration maximizes the protection of data, thus providing a comprehensive storage management solution. The list summarizes the changes for IBM Tivoli Storage Manager for Databases, divided into Data Protection for Microsoft SQL Server and Data Protection for Oracle.

#### 2.2.1 Data Protection for Microsoft SQL Server

Here are the changes and improvements for Data Protection for Microsoft SQL Server:

- ► Support is provided for Windows Server 2003.
- Separately installed Language Packs are available.
- Data Protection for SQL supports SQL Server 2000 (64-bit).
- Language option specifies locale information in the Data Protection for SQL preferences file (tdpsql.cfg).

#### 2.2.2 Data Protection for Oracle

The changes and improvements for Data Protection for Oracle include support for the following databases and operating systems:

- ► Oracle 9i databases
- Windows Server 2003 operating system
- Linux operating system
- Linux zSeries operating system
- ► AIX 5L<sup>TM</sup> (Version 5.1) operating system
- Solaris 9 operating system
- Oracle 9i databases

#### 2.2.3 IBM Tivoli Storage Manager for ERP

Specifically designed and optimized for the SAP R/3 environment, IBM Tivoli Storage Manager for ERP provides automated data protection, reduces the CPU performance impact of data backups and restores on the R/3 server, and greatly reduces the administrator workload necessary to meet data protection requirements. Tivoli Storage Manager for ERP builds on the SAP BR Tools, a set of database administration functions integrated with R/3 for database control and administration.

The Storage Manager for ERP software module allows multiple R/3 servers to utilize a single Tivoli Storage Manager server to automatically manage the backup of R/3 data. As the intelligent interface to the R/3 database, Tivoli Storage Manager for ERP is SAP certified in heterogeneous environments, supporting large-volume data backups, data recovery, data cloning, and disaster recovery of multiple SAP R/3 servers.

Here are the new functions and improvements in Version 5.3:

- The new release will adhere to the IBM Tivoli Storage Manager VRMF numbering — Version, Release, Modification, Fix. Although this is actually "only" a new release, the version number has been incremented from 3 to 5 to match the numbering of the IBM Tivoli Storage Manager family.
- Simulated backup/restore allows for "non-invasive" testing in production environments.
- Analysis of data throughput bottlenecks in production or simulated runs is greatly simplified by enhancements in the Administration Assistant.
- CPU load reduction for LAN-free backups minimizes impact of online backups on production work.
- Redirected restore capability in BACKFM simplifies cloning of mySAP Oracle databases.
- Support is provided for the new DB2® V8.2 log archive API that exploits enhanced log file management for DB2 UDB.
- Support is included for:
  - HP-UX 11iV2 on Itanium processors
  - Oracle RAC (AIX-GPFS) (available 1Q05)

#### 2.3 IBM Tivoli Storage Manager for Hardware

Data Protection for IBM ESS for mySAP.com Technology (hereafter, DP for ESS) minimizes the impact on mySAP.com database servers while allowing automated database backups to the IBM Tivoli Storage Manager Server. DP for ESS off-loads the transfer of backup data from the database server. The database must reside on an ESS storage subsystem.

DP for ESS provides options to implement high-efficiency backup and recovery of business-critical databases while virtually eliminating backup-related downtime or user disruption on the production host. The new FlashCopy® Restore (FlashBack Restore) functionality of DP for ESS provides a fully automated tool for a quick restore of business-critical databases. DP for ESS now exploits the IBM ESS Copy Services for both FlashCopy Backup and FlashCopy Restore.

This list summarizes the changes for IBM Tivoli Storage Manager for Hardware, divided into Data Protection for IBM ESS for mySAP.com (DB2 UDB) and Data Protection IBM ESS for mySAP.com (Oracle).

#### 2.3.1 Data Protection for IBM ESS for mySAP.com (DB2 UDB)

Here are the changes and improvements for Data Protection for IBM ESS for mySAP.com (DB2 UDB):

- Support is provided for:
  - DB2 UDB EEE (Enterprise Extended Edition)
  - FlashCopy Restore (also known as FlashBack Restore)
  - SDD Configurations on the backup system
  - Incremental FlashCopy

**Note:** The Incremental FlashCopy feature requires AIX 5.1 or AIX 5.2. It is not available on AIX 4.3.3.

- ► File system consistency check is done for FlashCopied database volumes.
- ► There is a new Setup File parameter:
  - backup\_destination
- The following new commands are available:
  - WITHDRAW
  - QUERYDISK
  - HELP
- Selected FlashCopy V2 functionality is employed:
  - Incremental FlashCopy
  - FlashCopy across different logical subsystems (eliminates an ESS volume setup restriction)
- The range of supported platforms is increased to include AIX 5.2, and deleted AIX 4.3.3 as a supported platform.
- There are changes in setup requirements all volume groups of the production system containing ESS volumes must be set up with vpaths if SDD is installed.
- ► These features are provided:
  - DB2 UDB database multi-partition support
  - Configuration Wizard
  - Best Practices
  - How do I...
  - Data Protection for ESS on HACMP<sup>™</sup> and DB2 UDB Setup Data Protection for ESS can be set up to operate in a High Availability Cluster Multi-Processing (HACMP) and DB2 UDB environment.

► These commands are provided:

Data Protection for ESS Version 5.3 uses the backup-archive client command line interface exclusively. As a result, the following commands are new:

 DSMC Backup DB2UDB — Previous versions of Data Protection for ESS only performed backups of your Oracle database and did not require specifying backup on the command line. With several new commands available in Version 5.2.1, backup can now be specified on the command line.

This command replaces the essdb2p backup command. See "Backup DB2UDB" for detailed information.

 DSMC Restore DB2UDB — This command allows you to restore the Oracle database specified in the Setup File.

This command replaces the essdb2p restore command.

 DSMC Query DB2UDB — This command queries the IBM Tivoli Storage Manager Server for a list of local and IBM Tivoli Storage Manager snapshot backups.

This command replaces the essdb2p query command.

 DSMC Withdraw DB2UDB — This command withdraws persistent flashcopy relationship between all the Enterprise Storage Server® Source Volumes and Target Volumes related to your databases.

This command replaces the essdb2p withdraw command.

**Attention:** The withdraw command requires AIX 5.1 or AIX 5.2. It is not available on AIX 4.3.3.

- The following commands are not supported in Data Protection for ESS Version 5.3:
  - ESSDB2P BACKUP
  - ESSDB2P RESTORE
  - ESSDB2P MONITOR
  - ESSDB2P WITHDRAW
  - ESSDB2P QUERYDISK
  - ESSDB2P HELP
- Options There are several new options; see the documentation for more information.

#### 2.3.2 Data Protection for IBM ESS for mySAP.com (Oracle)

Here are the changes and improvements for Data Protection for IBM ESS for mySAP.com (Oracle):

Support for the SAP "SPLITINT Interface for Oracle". The older "Split Mirror Backup" interface and the Shortened Backup Processing Feature (SBPF) are no longer supported. The functionality of both is integrated into the new interface, and the DP for ESS program "IDSCNTL" has therefore been renamed to "SPLITINT".

**Note:** For existing installations upgrading to DP for ESS 1.2.10: In conjunction with the above program name change, the parameters "split\_cmd" and "resync\_cmd" have effectively been deleted and two new parameters, "split\_options" and "split\_resync", have been introduced.

- Support for FlashCopy restore (also known as FlashBack Restore). To support the FlashBack Restore, a new FCS\_FILE parameter has been introduced for DP for mySAP.com.
- Selected FlashCopy V2 functionality is employed:
  - Incremental FlashCopy
  - FlashCopy across different logical subsystems (eliminates an ESS volume setup restriction)
- Existing functionality has been changed ("unmount" function) and extended with the new "split" (formerly "flashcopy") and "resync" functions.
- ► A capability for a "diskonly" FlashCopy Backup is provided.
- Anew command (tdpessora) has been added to provide information for the restore/recovery process.
- The range of supported platforms has been increased to include AIX 5.2, and AIX 4.3.3 has been deleted as a supported platform.
- A paragraph has been added listing environments that are not supported
- ► There are changes in setup requirements:
- All volume groups of the production system containing ESS volumes must be set up with vpaths if SDD is installed.
- Data Protection for ESS provides FlashCopy restore (referred to as Quick Restore) for your Oracle database.
- Support is provided for Incremental FlashCopy.

**Note:** The Incremental FlashCopy feature requires AIX 5.1 or AIX 5.2. It is not available on AIX 4.3.3.

- ► A file system consistency check is done for FlashCopied database volumes.
- These are new Setup File parameters:
  - backup\_destination
  - database\_control\_file\_restore
  - database\_ops\_host\_sid\_orchome
  - shark\_query\_interval
  - shark\_query\_lun\_statusv
- These are new commands:
  - backup
  - restore
  - monitor
  - withdraw
  - querydisk
  - help

#### 2.4 IBM Tivoli Storage Manager for Application Servers

Data Protection for WebSphere Application Server (Data Protection for WAS) is a separately priced and licensed product from the IBM Tivoli Storage Manager backup-archive client. If you installed the Data Protection for WAS plug-in, you can use IBM Tivoli Storage Manager to back up WebSphere Application Server (WAS) Version 5.x.x components (Application Server and Network Deployment Manager). Data Protection for WAS is available with the IBM Tivoli Storage Manager backup-archive client Version 5.2.0 (or later).

Changes for this release are summarized below.

The new features include support for:

- WebSphere Application security
- WebSphere Application Server Express

The following new option is provided:

wasexphome

A new command has been added:

set waspassword

There is a new procedure:

A section has been added that describes how to automate Data Protection for WAS backups.

### Part 2

### IBM Tivoli Storage Manager server enhancements

This part of the book describes common and specific server enhancements and Storage Agent enhancements for AIX, HP-UX, Linux, Sun Solaris, OS/400, Windows, and Z/OS.



## 3

### Common server enhancements

This chapter discusses the new features and enhancements delivered in IBM Tivoli Storage Manager Version 5.3 server, which are common to all server platforms.

In this chapter we also provide information on major additions to IBM Tivoli Storage Manager in Versions 5.1.5/5.2/5.2.2.

**Note:** Please refer to the *IBM Tivoli Storage Manager Installation Guide* and the *IBM Tivoli Storage Manager Administrator's Guide* for each supported server platform, for more detailed information about the changes or new features.

#### 3.1 Changes in Version 5.1.5

There are no common server enhancements for this version of the IBM Tivoli Storage Manager Server.

#### No common server enhancements

Changes from IBM Tivoli Storage Manager Version 5.1 to 5.1.5 were limited to Linux and OS/400 PASE. These changes are documented in their respective platform specific chapters.

#### 3.2 Changes in Version 5.2

The changes to IBM Tivoli Storage Manager 5.2 covered many areas across many platforms.

The most obvious change is the new naming convention for the Tivoli Data Protection clients.

The following sections describe changes common to all platforms.

#### 3.2.1 Accurate SAN device mapping

This enhancement applies to all platforms OS/400 PASE and z/0S.

Device IDs within a SAN environment change when a reset or other environmental changes occur. With accurate SAN device mapping, Tivoli Storage Manager can now detect SAN changes using automatic detection of serial number and element addresses and report that a reconfiguration is required.

Monitoring the activity log for messages will inform an administrator when device changes on the SAN have affected Tivoli Storage Manager.

The following number ranges are for messages related to serial numbers:

ANR8952 through ANR8958

ANR8961 through ANR8967

See the following changed commands:

DEFINE DRIVE DEFINE LIBRARY DEFINE PATH UPDATE DRIVE UPDATE LIBRARY UPDATE PATH

**Note:** With accurate SAN device mapping on the Windows platform specifically, Tivoli Storage Manager can now detect SAN changes and automatically make the appropriate processing changes to the server definitions. AIX, HP, Solaris, and Linux only report that a reconfiguration is required.

**Restriction:** Some devices do not have the capability of reporting their serial numbers to applications such as the Tivoli Storage Manager server. If the server cannot obtain the serial number from a device, it cannot assist you with changes to that device's location on the SAN.

See "Recovering from Device Changes on the SAN" of the *IBM Tivoli Storage Manager Administrator's Guide* for more information.

#### 3.2.2 Increased archive retention limits

Tivoli Storage Manager now supports increased retention times for archives and backup sets (maximum value for *RETver*: 30,000 days = roughly 82 years, previously 9,999 days = roughly 27 years). These new retention values will allow data archives to be kept longer. See the *IBM Tivoli Storage Manager Server Administrator's Reference* for more information.

See the following changed commands:

DEFINE BACKUPSET

DEFINE COPYGROUP Tivoli Storage Manager

**DEFINE DOMAIN** 

**DELETE BACKUPSET** 

GENERATE BACKUPSET

QUERY BACKUPSET

UPDATE BACKUPSET

UPDATE COPYGROUP

UPDATE DOMAIN

#### 3.2.3 Licensing changes

The application client for the WebSphere server is now licensed. The licensing file **was.lic** is new to this release of Tivoli Storage Manager server.

**Tip:** Be aware that failure to register licenses for Tivoli Data Protection products can lead to unusual client behavior which can often be resolved by registering the relevant license.

See Chapter "Managing Server Operations" of the *Tivoli Storage Manager Administrator's Guide* for more information.

#### 3.2.4 Macintosh OS X unicode support for backup-archive client

Unicode file spaces are now supported on the Macintosh client. By supporting a Unicode-enabled client, the IBM Tivoli Storage Manager server can store file spaces with Unicode file space names, directory names, and file names. The client can successfully process an IBM Tivoli Storage Manager operation even when the file spaces contain directory names or files in multiple languages or when the client uses a different code page from the server.

See the following changed commands:

DELETE FILESPACE EXPORT NODE GENERATE BACKUPSET IMPORT NODE QUERY CONTENT QUERY FILESPACE QUERY OCCUPANCY QUERY RESTORE REGISTER NODE RENAME FILESPACE UPDATE NODE

See Chapter "Managing Client Nodes" of the *Administrator's Guide* for more information.

#### 3.2.5 Security firewall support

IBM Tivoli Storage Manager has enhanced support for environments with firewalls in which communication originating from outside the firewall is to be restricted. Clients normally contact the server but with the new firewall support, you can choose to restrict session initiation to the server (*sessioninitiation=serveronly*). Scheduled backup-archive client operations can be restricted to server-initiated sessions.

See Chapter "Adding Client Nodes" of the *IBM Tivoli Storage Manager Administrator's Guide* and *Quick Start* for more information.

#### 3.2.6 Server performance tuning

The maximum value of the server option TXNGROUPMAX has been increased. When transferring multiple small files, increasing the TXNGROUPMAX option can improve throughput for operations to tape. It is now possible to set the TXNGROUPMAX option for individual clients.

**Attention:** Performance tuning cannot be restricted to a single component of your Tivoli Storage Manager environment. It is an iterative and often complex process to achieve optimum performance in a given environment and should be undertaken with the knowledge that changes can sometimes cause performance to deteriorate as well as improve. For example improving backup times can impact restore performance.

For more information, see the *Administrator's Reference*, as well as the *IBM Tivoli Storage Manager Performance Tuning Guide*, SC32-9101-01, available from:

http://publib.boulder.ibm.com/tividd/td/TSMM/SC32-9101-01/en\_US/HTML/SC32-9101-01.htm

#### 3.2.7 Server-to-server export and import

This functionality is available to all platforms except OS/400 PASE and was introduced for selected platforms prior to 5.2.

Tivoli Storage Manager server export and import processing has been enhanced to support the following functions:

 Direct server export to server import over the TCP/IP communications line between two servers of the same or differing platforms, which eliminates the need for compatible sequential device types between servers to perform data movement.

- Merging of imported data into existing client file spaces on the server.
- Ability to export client file data based on a date and time specification, which allows server-to-server export and import operations to maintain duplicate copies of client data on two or more servers.

See the Administrator's Guide for more information.

See the following changed commands:

EXPORT ADMIN EXPORT NODE EXPORT POLICY EXPORT SERVER IMPORT NODE IMPORT SERVER

#### 3.2.8 StorageTek VolSafe support

This functionality is available to all platforms except Linux and OS/400 PASE.

Tivoli Storage Manager now supports StorageTek's VolSafe media technology.

#### 3.2.9 SCSI libraries with multiple drive types

This function is common to all platforms except OS/400 PASE.

IBM Tivoli Storage Manager now supports libraries that are configured with more than a single drive and media type. Partitioning the library to segregate the device types is not required, but each device type requires a separate device class and storage pool. This is limited to certain models which are denoted as such in the *IBM Tivoli Storage Manager Supported Devices* Web page:

http://www.ibm.com/software/sysmgmt/products/support/IBM\_TSM\_Supported\_Devices\_
for\_AIXHPSUNWIN.html

http://www.ibm.com/software/sysmgmt/products/support/IBM\_TSM\_Supported\_Devices\_ for\_Linux.html

http://www.ibm.com/software/sysmgmt/products/support/IBM\_TSM\_Supported\_Devices\_
for\_iSeries.html

#### 3.2.10 TapeAlert device support

This function is common to all platforms except OS/400 PASE and z/OS.

TapeAlert is an application that provides detailed diagnostic information about tape and library device hardware errors. It captures the log page from the drive or library when tapes are dismounted and issues the appropriate ANRxxxx error messages, allowing you to recognize problems as early as possible.

See "Handling Tape Alert Messages" in the *Administrator's Guide* for more information.

Tape alert messages are turned off by default. You may set tape alert messages to ON or OFF by using the SET TAPEALERTMSG command. You may query tape alert messaging status by using the QUERY TAPEALERTMSG command.

#### 3.2.11 Tape autolabelling

Tivoli Storage Manager now provides the option to have tape volumes automatically labeled by the server. This option is available for SCSI library types. The server will label both blank and incorrectly labeled tapes when they are initially mounted. This eliminates the need to pre-label a set of tapes.

#### 3.3 Changes in Version 5.2.2

IBM Tivoli Storage Manager 5.2.2 introduced some new functionality and features, not the least of which was Operational Reporting. This subject is covered more completely in the 3.3.5, "Operational Reporting" on page 36.

#### 3.3.1 EMC Centera support

This device support is common to all platforms except OS/400 PASE and z/OS.

Tivoli Storage Manager now supports the EMC Centera Version 2.0 storage device. Centera devices provide retention protection for archiving fixed content digital data records. Tivoli Storage Manager for Data Retention together with Centera devices provide a foundation storage system that allows mission-critical data to be retained for a mandated period of time without the possibility of being rewritten or erased. Centera devices can also be used as standard storage devices if no mandatory retention requirements exist for the data.

To enable Centera support for data retention protection, use these new commands:

DEFINE DEVCLASS CENTERA

SET ARCHIVERETENTION PROTECTION

For more information about Tivoli Storage Manager support of Centera devices, see "Defining and Updating CENTERA Device Classes" in the *Administrator's Guide*.

#### 3.3.2 IBM 3592 support

Tivoli Storage Manager now supports IBM 3592 devices. The 3592 device has fast access capability that gives users the option of scaling down tape capacities in order to get improved data access response times. See "Scale Capacity" and "Setting Up a Storage Pool Hierarchy" in the *Administrator's Guide* for more information.

#### 3.3.3 IBM Tivoli Storage Manager for Data Retention

Tivoli Storage Manager for Data Retention provides enhancements to Tivoli Storage Manager Extended Edition to prevent critical data from being erased or rewritten. This *new product* helps meet additional requirements defined by regulatory agencies for retention and disposition of data. These enhancements include new functionality and new device support and are delivered in these key areas:

#### Data retention protection

This feature prevents deliberate or accidental deletion of data until its specified retention criterion is met.

#### **Event based retention policy**

In some cases, retention must be based on an external event such as closing a brokerage account. Tivoli Storage Manager for Data Retention supports event-based retention policy to allow data retention to be based on an event other than the storage of the data.

#### **Deletion hold**

In order to ensure that records are not deleted when a regulatory retention period has lapsed but other legal requirements mandate that the records continue to be maintained, Tivoli Storage Manager for Data Retention includes deletion hold. Using this feature will prevent stored data from being deleted until the hold is released.

For additional reading also see the IBM Redbook, *Understanding the IBM TotalStorage Data Retention 450*, SG24-7091-00.

#### 3.3.4 NDMP operations and support

These enhancements are common to all platforms except OS 400 and z/OS OS/390.

Tivoli Storage Manager now supports backup using NDMP for NAS file servers that comply with NDMP standards and are neither EMC Celerra nor Network Appliance file servers. NAS vendors can now use a certification process in order to ensure NAS file servers are compatible with Tivoli Storage Manager.

NDMP operations for backup of NAS file servers have been enhanced to support the following functions:

- Directory-level backup of NAS data, which enables the division of a file system backup operation among several NDMP backup operations as well as several tape drives. This enhancement will reduce backup and restore times.
- NDMP Directory Level Backup will enable Tivoli Storage Manager to backup user created snapshots that are stored as sub-directories, specifically Network Appliance snapshots.

See "Using NDMP for Operations with NAS File Servers" in the *IBM Tivoli* Storage Manager 5.2.2 Server Administrator's Guide for more information.

#### IBM 3494 library support

NDMP support to the library type IBM 3494 Tape Library DataServer is now provided.

See "Using NDMP for Operations with NAS File Servers" in the *IBM Tivoli Storage Manager 5.2.2 Server Administrator's Guide* for more information, specifically "Configuration 3: 349X Library Connected to the Tivoli Storage Manager Server".

#### **File level restore**

Tivoli Storage Manager currently provides backup and recovery support for network-attached storage (NAS) file servers and utilizes Network Data Management Protocol (NDMP) to communicate with and provide backup and recovery services for NAS file servers. Support for file level restore includes enhancements to allow tracking of individual files within a backed-up file system image. This enhancement makes it possible to display the contents of an image backup, and individual files within that image can be selected for restore. Implementation is achieved by generating a table of contents (TOC) during backup which is stored on the server.

See "Using NDMP for Operations with NAS File Servers" in the *Administrator's Guide* for more information, specifically "Planning for File-Level Restore".

#### EMC Celerra NAS device support

Backup and restore operations for EMC Celerra file servers via NDMP is now supported. This support includes all base NDMP functions provided for Network Appliance file servers as well as the file-level restore function.

See "Using NDMP for Operations with NAS File Servers" and "Managing Storage Pools and Volumes" in the *Administrator's Guide* for more information.

#### 3.3.5 Operational Reporting

This function provides operators and administrators with an at-a-glance view of the performance of their IBM Tivoli Storage Manager environments.

This new feature has not been previously documented, so, for more information, see "Chapter 21., "Monitoring the IBM Tivoli Storage Manager Server", section "Using IBM Tivoli Storage Manager Operational Reporting" in the *Tivoli Storage Manager 5.3 for Windows Administrator's Guide*.

**Note:** More details are provided in Chapter 24., "Operational Reporting" on page 303.

#### Additional reading

The IBM Redpaper, *Integrating IBM Tivoli Storage Manager Operational Reporting with Event Management*, REDP-3850-00, can be found on the IBM Redbooks Web site at:

http://ibm.com/redbooks

This Redpaper outlines how it is possible to integrate management and reporting in IBM Tivoli Storage Manager environments into an enterprise-wide IT monitoring and management solution. It shows how IBM Tivoli Storage Manager Operational Reporting can be used to simplify the monitoring and reporting on the status of Tivoli Storage Manager environment, as well as how this can be displayed centrally on an enterprise event management console.

#### 3.3.6 Sony AIT50 and IT100 WORM media support

This device support is common to all platforms except OS/400 PASE and z/OS.

Tivoli Storage Manager now supports the Sony AIT50 and AIT100 WORM (write once, read many) media technology. To enable this support, the **DEFINE DEVCLASS** (8MM) command has a new parameter. For more information about WORM media, including Sony AIT50 and AIT100, see "Special Considerations for WORM Tape Media" in the *Administrator's Guide*.

#### 3.3.7 TCPPORT, TCPADMINPORT, and defaults

Note that *TCPADMINPORT* is a new server option for Tivoli Storage Manager 5.2 which defaults to the value 1500. It does NOT default to the same value as the *TCPPORT* option. If multiple servers are running on a system and one of those servers is using a *TCPPORT* value of 1500 and if the *TCPADMINPORT* option is not specified in all of the server option files, a conflict will occur on port 1500. Only the first server to be brought up will be able to use this port. Other servers will fail to communicate on port 1500.

#### Notes:

- This option also applies to Storage Agents.
- The default value has been changed in 5.3., see 18.4.5, "Optimized option default values" on page 155.

#### 3.4 Changes in Version 5.3

IBM Tivoli Storage Manager 5.3 has introduced many improvements, most of which are common to all supported server platforms. See the appropriate server specific chapter for details regarding a specific platform.

Note: The Quick Start Guide is now entitled Install Guide.

#### 3.4.1 ACSLS library support enhancements

With the exception of HP-UX, OS/400 and z/OS, library support has been enhanced to allow the sharing of ACSLS libraries.

This implementation will provide the basic support to share ACSLS libraries across Tivoli Storage Manager servers in the same way that SCSI libraries are shared. Support for LAN-free data movement using libraries that are controlled by StorageTek's ACSLS interface has also been provided. As a result, the use of a third party product is no longer required.

IBM Tivoli Storage Manager supports tape libraries controlled by StorageTek Automated Cartridge System Library Software (ACSLS). The ACSLS library server manages the physical aspects of tape cartridge storage and retrieval. The ACSLS client application communicates with the ACSLS library server to access tape cartridges in an automated library. Tivoli Storage Manager is one of the applications that gains access to tape cartridges by interacting with ACSLS through its client, which is known as the control path.

The Tivoli Storage Manager server reads and writes data on tape cartridges by interacting directly with tape drives through the data path. The control path and the data path are two different paths. The ACSLS client daemon must be initialized before starting the server. See /usr/tivoli/tsm/devices/bin/rc.acs\_ssi for the client daemon invocation. For detailed installation, configuration, and system administration of ACSLS, refer to the appropriate StorageTek documentation.

See "Configuring Storage Devices" in the *Administrate's Guide* for more information.

See the following changed commands:

DEFINE LIBRARY

UPDATE LIBRARY

#### Multiple ACSLS server configuration

A single Tivoli Storage Manager Server is not capable of communicating with more than one ACSLS server because it is not possible to define more than one ACSLS in the Tivoli Storage Manager SSI (rc.acs\_ssi) (Note: in Windows STK LibAttach needs to be installed). Third party products are able to access several ACSLS servers.

For a better understanding of what a shared Tivoli Storage Manager/ACSLS environment might look like, see Figure 3-1.

Explanation of abbreviations used:

- CSC=Client System Component
- CSI=Client System Interface
- ACSLS=Automated Cartridge System Library Software
- TSM SSI = Tivoli Storage Manager Subsystem Interface



Figure 3-1 How the components for library-sharing work together

The following example provides you with a solution to this problem. You can use multiple ACSLS by defining them on several Tivoli Storage Manager Servers or instances and sharing them.

**Note:** A single Tivoli Storage Manager server is not capable of communicating with more than one ACSLS server.

The following outline represents the rough steps that allow any Tivoli Storage Manager server to access any ACSLS library.

For example, if you have ACSLS Server 1, 2, and 3...

#### Sharing several ACSLS servers among several servers From SERVER1:

**DEFINE LIB1 LIBTYPE=ACSLS** -> (that is, SERVER1 setup for communication with ACSLS Server1) DEFINE LIB2 LIBTYPE=SHARED PRIMMGR=SERVER2 DEFINE LIB3 LIBTYPE=SHARED PRIMMGR=SERVER3 DEFINE SERVER SERVER2 DEFINE SERVER SERVER3

From SERVER2:

**DEFINE LIB2 LIBTYPE=ACSLS** -> (that is, SERVER2 setup for communication with ACSLS Server2)

DEFINE LIB1 LIBTYPE=SHARED PRIMMGR=SERVER1 DEFINE LIB3 LIBTYPE=SHARED PRIMMGR=SERVER3 DEFINE SERVER SERVER1 DEFINE SERVER SERVER3

From SERVER3:

**DEFINE LIB3 LIBTYPE=ACSLS** -> (that is, SERVER3 setup for communication with ACSLS Server3)

```
DEFINE LIB1 LIBTYPE=SHARED PRIMMGR=SERVER1
DEFINE LIB2 LIBTYPE=SHARED PRIMMGR=SERVER2
DEFINE SERVER SERVER1
DEFINE SERVER SERVER2
```

You may consider consolidating control of your libraries into a single ACSLS server. The ACSLS HA (high availability) option provides redundancy to minimize down time etc.

#### Accessing several ACSLS servers from one server

The previous outline represented the rough steps that allowed any Tivoli Storage Manager server to access any ACSLS library.

To illustrate the case where SERVER1 is your single Tivoli Storage Manager server that would like access to multiple ACSLS library servers... consider this.

Tivoli Storage Manager SERVER2 and SERVER3 act exclusively as library managers and control access to the tape drives and tape library volume inventory. Neither of the servers require NODE definitions, in other words backup/archive clients do not connect to these servers. These servers maintain Tivoli Storage Manager server-to-server connections with Tivoli Storage Manager SERVER1 as a result of the Tivoli Storage Manager library sharing engagement. The client NODE is registered on SERVER1. The storage pools and logical storage pool volumes reside on SERVER1. Device classes referencing LIB2 and LIB3 require the service of SERVER2 and SERVER3 respectively. The physical tape volume cartridges reside in ACSLS libraries LIB2 and LIB3. Tivoli Storage Manager SERVER1 can host LAN-free activity whose target library is LIB1, LIB2, or LIB3.
For example, assume that the LAN-free StgAgentA is configured to store on LIB2 and the associated client NODEA is registered on SERVER1. Likewise, StgAgentB will target tape volumes located in LIB3 while the associated client NODEB is registered on Tivoli Storage Manager SERVER1.

The following steps are meant to serve as an example and are not complete, but rather are intended to represent a rough outline of the general steps.

This outline has been modified to include DRIVEs and PATHs. Additional steps to represent a LAN-free configuration are highlighted with an underscore.

From SERVER1:

DEFINE LIB1 LIBTYPE=ACSLS -> (that is, SERVER1 setup for communication with ACSLS Server1) DEFINE LIB2 LIBTYPE=SHARED PRIMMGR=SERVER2 DEFINE LIB3 LIBTYPE=SHARED PRIMMGR=SERVER3 DEFINE SERVER SERVER2 DEFINE SERVER SERVER3 DEFINE PATH SERVER1 DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB1 DEVICE=xxx

**Note:** There is no path definition for SERVER2, SERVER3, or STGAGENTs for LIB1, since they have no need (LIB1 in this configuration could be for exclusive use of SERVER1 for DB backup).

REG NODE NODEA REG NODE NODEB DEFINE SERVER STGAGENTA DEFINE SERVER STGAGENTB

From SERVER2

**DEFINE LIB2 LIBTYPE=ACSLS** -> (that is, SERVER2 setup for communication with ACSLS Server2)

DEFINE DRIVE LIB2 DRIVEX DEFINE SERVER SERVER1 DEFINE PATH SERVER2 DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB2 DEVICE=xxx DEFINE PATH SERVER1 DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB2 DEVICE=xxx DEFINE SERVER STGAGENTA DEFINE PATH STGAGENTA DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB2 DEVICE=yyy From SERVER3:

DEFINE LIB3 LIBTYPE=ACSLS -> (that is, SERVER3 setup for communication with ACSLS Server3) DEFINE DRIVE LIB3 DRIVEX DEFINE SERVER SERVER1 DEFINE PATH SERVER3 DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB3 DEVICE=xxx DEFINE PATH SERVER1 DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB3 DEVICE=xxx DEFINE SERVER\_STGAGENTB DEFINE SERVER\_STGAGENTB DEFINE PATH STGAGENTB DRIVEX SRCTYPE=SERVER DESTT=DRIVE LIBRARY=LIB3 DEVICE=yyy

**Note:** Device classes on SERVER1 must exist on SERVER2 and SERVER3 and be policy configured to direct NODEA / STGAGENTA to LIB2, etc.

## 3.4.2 Activity log management

The activity log can now be managed based either on maximum size for the log or retention time. The new option for size-based activity log management gives administrators greater control over the amount of space the activity log occupies.

Additional information about the activity log is now displayed when the server status is queried as shown in Example 3-1.

Example 3-1 Additional information now displayed with QUERY STATUS

```
tsm: POLONIUM1>q stat

Storage Management Server for Windows - Version 5, Release 3, Level 0.0

Server Name: POLONIUM1

Server host name or IP address: polonium.almaden.ibm.com

Server TCP/IP port number: 1500

.

Activity Log Retention: 60 Day(s)

Activity Log Number of Records: 6970

Activity Log Size: <1 M

.
```

See the Administrator's Guide for more information.

See the following changed commands: QUERY STATUS SET ACTLOGRETENTION

## 3.4.3 Check-in and check-out enhancements

These enhancements are common to all platforms except z/OS.

The amount of user intervention required for check-in and check-out functions has been reduced.

See the *Administrator's Guide* and *Administrator's Reference* for more information.

See the following changed commands:

CHECKIN LIBVOLUME CHECKOUT LIBVOLUME LABEL LIBVOLUME MOVE DRMEDIA MOVE MEDIA

**Note:** A REPLY command is no longer required if you specify a wait time of zero using the optional *WAITTIME* parameter on the **CHECKIN LIBVOLUME** or **LABEL LIBVOLUME** command. The default wait time is 60 minutes. See Example 3-2 for a command line example.

Example 3-2 Labeling and check-in of tapes without a reply by using WAITTIME=0

LABEL libvol TSMLIBO1 search=BULK labelsource=barcode overwrite=NO checkin=SCRATCH WAITTIME=0

In the Administration Center, when adding volumes, the *WAITTIME* parameter is the value provided in the **Advanced Options** window for *If a volume is not mounted within this amount of time, cancel the mount request in*[0] *Minutes* as shown in Figure 3-2.



Figure 3-2 Administration Center check-in options - WAITTIME

**Note:** For the commands, **CHECKOUT LIBVOLUME**, **MOVE DRMEDIA**, and **MOVE MEDIA**, the new default value of the *REMOVE* option is now *REMOVE=BULK*, which means that a REPLY is not requested. Additionally, the server waits for a port to be made available if it is full (Example 3-3).

Example 3-3 Check-out of tapes without a reply by using REMOVE=BULK

CHECKOut LIBVolume tsmlib01 ABA920L1 REMove=Bulk CHECKLabel=No

In the Administration Center, when checking out volumes, the *REMOVE=BULK* option is "*YES, and move volume to bulk input-output station (requires operator reply)*" value provided for the "Eject volume" on the last window, Checkout Option, as shown in Figure 3-3.

Be advised that, despite this statement, it does NOT require an operator reply! The *REMOVE=YES* option is equivalent to "*YES*", and this requires an operator reply !

This information is based on the GA Version of IBM Tivoli Storage Manager 5.3 and may be corrected when this book is published.



Figure 3-3 Administration Console Checkout Options - Remove No/Yes/to bulk

## 3.4.4 Collocation by group

Collocation by group is now supported. Groups of nodes can be defined, and the server can then collocate data based on these groups. Collocation by group can yield the following benefits:

- Reduce unused tape capacity by allowing more collocated data on individual tapes.
- Minimize mounts of target volumes.
- Minimize database scanning and reduce tape passes for sequential-to-sequential transfer.

**Note:** For newly defined storage pools, the default storage pool collocation setting is now **GROUP**.

**Attention:** If you specify *COLLOCATE=GROUP* (which now is the default) but do not define any groups, or you define a group but do not add nodes to the group, data is collocated by node!

So, if collocation is not desired, then set *COLLOCATE=NO*, which previously has been the default.

**Note:** During collocation processing the message ANR1142I will be replaced with ANR1176I.

Figure 3-4 illustrates collocation by group for client nodes. Three groups have been defined, and the data for each group is stored on separate volumes.



Figure 3-4 Example of collocation by group enabled

See the *Administrator's Guide* for more information, specifically "Keeping a Client's Files Together: Collocation".

Some typical Collocation Groups are illustrated in Figure 3-5.



Figure 3-5 Group of nodes on sequential media

## **Benefits of Collocation Groups**

The benefits of Collocation Groups are listed below:

 Collocation of small nodes without requiring that a tape and library slot be dedicated to each node

- Optimal recovery:
  - Efficient collocation of small nodes
  - Possible increased efficiency for multi-session restore by spreading data for a node over multiple volumes
  - Possible collocation of copy storage pools for offsite storage
- Improved efficiency for internal data-transfer operations by transferring all nodes in the group together:
  - Minimizes mounts of target volumes
  - For sequential-to-sequential transfer (such as reclamation), minimizes database scanning and reduces tape passes

See the following new commands:

DEFINE COLLOCGROUP

DEFINE COLLOCMEMBER

DELETE COLLOCGROUP

DELETE COLLOCMEMBER

QUERY COLLOCGROUP

QUERY NODEDATA

UPDATE COLLOCGROUP

See the following changed commands:

DEFINE STGPOOL

MOVE NODEDATA

QUERY NODE

QUERY STGPOOL

REMOVE NODE

UPDATE STGPOOL

#### Examples of the new commands

Next we show some examples of the following new commands: DEFINE COLLOCGROUP in Example 3-4, DEFINE COLLOCGROUP in Example 3-5, QUERY COLLOCGROUP in Example 3-6; and QUERY NODEDATA in Example 3-7.

#### DEFINE COLLOCGROUP

Example 3-4 DEFINE COLLOCGROUP

tsm: POLONIUM1>DEF COLLOCG cg\_example DESC="Example collocation group"
ANR4871I Collocation group EXAMPLE defined.

#### DEFINE COLLOCMEMBER

Example 3-5 DEFINE COLLOCMEMBER

tsm: POLONIUM1>q node Node Name	Platform	Policy Domain Name	Days Last	Since Acce- ss	Days Since Password Set	Locked?
CRETE	AIX	DOM_ITSO_UNIX		<1	<1	No
CRETE1	AIX	DOM_ITSO_UNIX		<1	<1	No

tsm: POLONIUM1>DEF COLLOCM cg\_example crete,crete1
ANR4883I Node CRETE associated to collocation group CG\_EXAMPLE.
ANR4883I Node CRETE1 associated to collocation group CG\_EXAMPLE.
ANR4878I DEFINE COLLOCMEMBER: 2 members defined in the collocation group
CG\_EXAMPLE.

#### QUERY COLLOCGROUP

Example 3-6 QUERY COLLOCGROUP

tsm: POLONIUM1>q collocg	
Collocation Group Name	Collocation Group Description
CG_EXAMPLE	Example collocation group

#### **QUERY NODEDATA**

Example 3-7 QUERY NODEDATA

tsm: POLONIUM1>Q M Node Name	NODED COLLOCG=cg_example Volume Name	Storage Pool Name	Physical Space Occupied (MB)
CRETE	ABA922L1	BACKUPLTO	1,609.32
CRETE1	ABA922L1	BACKUPLTO	61.57

**Note: QUERY NODEDATA** lists only those collocation group members that already have data backed up.

**QUERY NODE crete F=D** displays all the node information for each node, including "Collocation Group Name: CG\_EXAMPLE", so in order to obtain a list of nodes along with the collocation group name that they are a member of, you can use a select statement as shown in the example in Example 3-8. (The node CRETE2 has previously been added as a member to the collocation group using **DEFINE COLLOCMEMBER** and does not show up with **QUERY NODEDATA** because data has not been backed up yet).

Example 3-8 SELECT statement for listing node name and collocation group name

tsm: POLONIUM1>select NODE_NAME	node_name,COLLOCGROUP_NAME from nodes COLLOCGROUP_NAME
CRETE	CG_EXAMPLE
CRETE1	CG EXAMPLE
CRETE2	CGEXAMPLE
POLONIUM	-

Table 3-1 lists the dependencies between collocation groups and storage pool collocation.

Storage pool collocation attributes	Node not defined in a collocation group	Node defined in a collocation group
NO	No collocation	No collocation
GROUP	Collocation by node	Collocation by group of nodes
NODE	Collocation by node	Collocation by node
FILESPACE	Collocation by file space	Collocation by file space

Table 3-1 Dependencies of collocation groups and storage pool collocation

## 3.4.5 Database reorganization

Periodically reorganizing the server's database can improve performance. A new command has been added that allows administrators to determine the estimated space saved by reorganization of the database. The process can be queried to monitor the command's progress and, when finished, the results can be viewed by querying the database in detailed format as shown in Example 3-9.

Example 3-9 ESTIMATE DBREORGSTATS and detailed query of database

```
tsm: POLONIUM1>ESTIMATE DBREORGSTATS
ANS8003I Process number 9 started.
```

tsm: POLONIUM1>q db f=d

```
Available Space (MB): 1,024
                 Assigned Capacity (MB): 1,024
                 Maximum Extension (MB): 0
                 Maximum Reduction (MB): 940
                      Page Size (bytes): 4,096
                     Total Usable Pages: 262,144
                             Used Pages: 16,245
                               Pct Util: 6.2
                          Max. Pct Util: 8.1
                       Physical Volumes: 1
                      Buffer Pool Pages: 65,536
                  Total Buffer Requests: 419
                         Cache Hit Pct.: 100.00
                        Cache Wait Pct.: 0.00
                    Backup in Progress?: No
             Type of Backup In Progress:
           Incrementals Since Last Full: 1
         Changed Since Last Backup (MB): 41.25
                     Percentage Changed: 65.00
         Last Complete Backup Date/Time: 12/03/2004 14:19:30
     Estimate of Recoverable Space (MB): 12
Last Estimate of Recoverable Space (MB): 12/09/2004 10:56:48
```

These two lines from the above example provide the details concerning recoverable database space by reorganizing:

```
Estimate of Recoverable Space (MB): 12
Last Estimate of Recoverable Space (MB): 12/09/2004 10:56:48
```

See the following new command:

ESTIMATE DBREORGSTATS

See the following changed commands:

CANCEL PROCESS

QUERY DB

QUERY PROCESS

See Chapter 19, "Managing the Database and Recovery Log," on page 469 of the *Administrator's Guide* for more information.

#### 3.4.6 Disk only backup

This is common to all platforms except z/OS.

Disk-only backup has been enhanced in order to take advantage of the inexpensive disk storage currently available on the market. These improvements to sequential-access FILE device type and random-access DISK device class storage include:

- The ability to create large, sequential-access FILE-type storage pools using a single FILE device-class definition that specifies two or more directories.
- The ability to create and format FILE device type or DISK device type volumes in a single step.
- The ability to use enhanced space trigger functionality to automatically allocate space for private volumes in sequential-access FILE device type and random-access DISK device class storage pools. This will reduce the potential for disk fragmentation and maintenance overhead.

**Note:** There have also been improvements in the reclamation processes allowing for better utilization of available FILE volumes (see 3.4.7, "Enhancements for server migration and reclamation processes" on page 52).

See the Administrator's Guide for more information.

See the following changed commands:

**DEFINE DBCOPY** 

DEFINE DEVCLASS—FILE

DEFINE LOGCOPY

DEFINE PATH—when the destination is a drive

DEFINE SPACETRIGGER

DEFINE VOLUME

UPDATE DEVCLASS—FILE

UPDATE PATH—when the destination is a drive

The **DEFINE DBCOPY** and **DEFINE LOGCOPY** now optionally offer to format the volumes in one operation. Previously it was only possible to format the volumes via the **DSMFMT** command.

Among several other new or changed options for the **DEFINE DEVCLASS** -- **FILE** command, one is the *DIRECTORY* option, which now offers to define several directories for the files used in this device class. Since the files are created as needed, they are created in the directories defined.

Table 3-3 gives you an overview of the characteristics on usage of sequential-access FILE device type in comparison to random-access DISK device class storage pools.

	Random-access	Sequential-access
Space allocation/tracking	Random 4KB blocks	Sequential within file volume
Tivoli Storage Manager caching	Optional (backup overhead)	Not supported
Space recovery (no cache)	When file is deleted/moved	When volume is reclaimed
Recovery of cache space	When space is needed	Not applicable
Aggregate reconstruction	Not supported	During volume reclamation
Concurrent volume access	Yes	Not supported
Multi-session client restore	One session for all volumes	One session per volume
Target for LAN-free backup	Not supported	Yes, via SANergy®
Can be used for copy pools	No	Yes
Migration/stg pool backup	By node and file space	By volume
Parallel migration processes	Yes	Yes (beginning in 5.3)
Storage pool backup	Must check every file	Optimized for efficiency
Pools can span file systems	Yes	Yes (beginning in 5.3)
Database regression	Must audit all volumes	Reuse delay avoids audit

Table 3-2 Random vs. sequential access DISK/FILE device class storage pools

## 3.4.7 Enhancements for server migration and reclamation processes

Administrators can now control and schedule routine server operations by scheduling the migration or reclamation command to run during convenient server activity times. The number of processes for migration and reclamation is also enhanced to allow multiple processes for the operations. These new features allow for better utilization of available tape drives and FILE volumes.

See the following new commands:

MIGRATE STGPOOL

RECLAIM STGPOOL

See the changed commands:

DEFINE STGPOOL QUERY STGPOOL UPDATE STGPOOL

See "Managing Storage Pools and Volumes" in the *IBM Tivoli Storage Manager Administrator's Guide* for more information.

Next we show the command syntax for **MIGRATE STGPOOL**, in Example 3-10, and **RECLAIM STGPOOL**, in Example 3-11.

#### **MIGRATE STGPOOL**

Example 3-10 MIGRATE STGPOOL

MIGrate STGpool backuppool LOwmig=0 DUration=30

The **MIGRATE STGPOOL** command will ignore the value of the *HIGHMIG* parameter of the storage pool definition. Migration will occur regardless of the value of the HIGHMIG parameter.

**Note:** The *LOWMIG* threshold must be lower than the percentage of the amount of data currently in the storage pool when using the **MIGRATE STGPOOL** command, otherwise migration will not be started.

#### **RECLAIM STGPOOL**

Example 3-11 RECLAIM STGPOOL

RECLaim STGpool backuplto THreshold=55 DUration=30

## 3.4.8 IBM 3592 WORM support

IBM Tivoli Storage Manager now supports the 3592 WORM tape device.

See the following changed commands:

**DEFINE DEVCLASS—3592** 

**DEFINE LIBRARY** 

**UPDATE LIBRARY** 

See "Defining Device Classes" and "Managing Removable Media Operations" for more information in the *Tivoli Storage Manager Administrator's Reference Guide*.

## 3.4.9 Improved defaults

Defaults for parameters on some commands and server options have been improved to better match conditions in current user environments. If you have not specified these options in the options file, new defaults will take effect immediately. If you have specified some of these options, the value you have already specified will be used and the default changes will have no effect.

See the following new server option:

ADMINONCLIENTPORT

See the following changed commands:

DEFINE DEVCLASS

DEFINE STGPOOL—Primary Sequential Access and Copy Sequential Access MOVE DATA

See the following changed server options:

BUFPOOLSIZE

MOVEBATCHSIZE

MOVESIZETHRESH

TCPBUFSIZE

TCPWINDOWSIZE

See "Defining Device Classes" and "Managing Client Nodes" in the *IBM Tivoli* Storage Manager Administrator's Guide, as well as the *IBM Tivoli Storage* Manager for Administrator's Reference for more information.

Table 3-3 gives an overview of the changes to the Tivoli Storage Manager Server defaults:

Option	Old default	New default	Additional information
BUFPoolsize	2048 (KB)	32768 (KB)	
MOVEBatchsize	40 (objects)	1000 (objects)	
MOVESizethresh	500 (MB)	2048 (MB)	
SELFTUNETXNsize	NO	N/A	With the changes to MOVEB and MOVES above, this option has been removed. There is no ""invalid option"" message, and no action based on the setting.

Table 3-3 Improved defaults (old/new values)

Option	Old default	New default	Additional information
TCPBufsize (AIX)	16 (KB)	32 (KB)	
TCPWindowsize		63 (KB)	63KB does not require RFC1323 support to be enabled (64 and up do) on either the client or server.
TXNGroupmax	40 (objects)	256 (objects)	
USELARGEBuffers	YES	N/A	NO would not outperform YES, thus YES is always set.
TCPNodelay	NO (YES for stgagent)	YES	Since Tivoli Storage Manager already buffers its data, the extra buffer of the operating system is redundant.
AIXDIRECTIO	YES	N/A	Turned on for all eligible disk volumes, and there is no benefit in turning it off, so YES is always set.
TCPADMINPORT	1500	value of TCPPORT	
ADMINONClientport	N/A - new option	YES	Defines whether or not the TCPPORT can be used by administrative sessions. If it is set to NO and the TCPADMINPORT value is different than the TCPPORT value, then administrative sessions cannot use the TCPPORT. If is set to YES, or the TCPPORT and TCPADMINPORT are the same (the default), then administrative sessions can use the TCPPORT.

## 3.4.10 Validating a LAN-free environment configuration

Enhancements have been made to allow you to quickly determine if your LAN-free environment has been configured correctly. You can request validation for one client node and one Storage Agent. When validation is requested, a detailed report is generated explaining why the storage pool is or is not LAN-free capable. As a result, you can determine if there is a setting or configuration issue on the server preventing LAN-free data movement, as shown in Example 3-12.

See the following new command:

VALIDATE LANFREE

tsm: POLONIUM1>validate lanfree crete sa crete ANRO387I Evaluating node CRETE using storage agent SA CRETE for LAN-free data movement. Node Storage Operation Mgmt Class Destination LAN-Free Explanation Name Agent Name Name capable? CRETE SA\_CRETE BACKUP MC\_FS\_LAN- BACKUPLANFR- Yes FREE EE CRETE SA CRETE BACKUP STANDARD BACKUPPOOL No Destination storage pool is DISK. MC FS LAN- ARCHIVELANF- Yes CRETE SA CRETE ARCHIVE FREE REE CRETE SA CRETE ARCHIVE STANDARD ARCHIVEPOOL No Destination storage pool is DISK.

ANR1706I Ping for server 'SA\_CRETE' was able to establish a connection. ANR0388I Node CRETE using storage agent SA\_CRETE has 2 storage pools capable of LAN-free data movement and 2 storage pools not capable of LAN-free data movement.

The output will allow you to see which management class destinations for a given operation type are not LAN-free capable, and provide a brief explanation about why (as can be seen in Example 3-13, "Validating LAN-free Configuration - explanation" on page 56). It will also report the total number of LAN-free destinations. See the VALIDATE LANFREE command in the Administrator's Reference and "Validating your LAN-free Configuration" in the IBM Tivoli Storage Manager Administrator's Guide for more information.

In Example 3-13, the storage pool BACKUPLANFREE has been configured for simultaneous write. Please notice the *NO* in the column "LAN-Free capable" and the explanation provided. This is because, when the operation is using LAN-free data movement, simultaneous write takes precedence over LAN-free operations, causing the operations to go over the LAN (see the note in the option *COPYSTGpools* section for the **DEFINE STGpool** command in the *Administrator's Reference*).

Example 3-13 Validating LAN-free Configuration - explanation

tsm: F ANRO38 moveme	POLONIUM1> 37I Evalua ent.	⊳validate ating node	lanfree cret CRETE using	te sa_crete g storage ager	nt SA_CRETE	E for LAN-free data
Node Name	Storage Agent	Operation	Mgmt Class Name	Destination Name	LAN-Free capable?	Explanation
CRETE	SA CRETE	BACKUP	MC FS LAN-	BACKUPLANFR-	No	Destination storage

	FREE	EE		pool is configured for simultaneous write.
CRETE SA_CRETE BACKUP	STANDARD	BACKUPPOOL	No	Destination storage pool is DISK.
CRETE SA_CRETE ARCHIVE	MC_FS_LAN- FREE	ARCHIVELANF- REE	Yes	
CRETE SA_CRETE ARCHIVE	STANDARD	ARCHIVEPOOL	No	Destination storage pool is DISK.
ANR1706I Ping for server	'SA_CRETE'	was able to	establish	a connection.
ANR0388I Node CRETE usir	ng storage ag	gent SA CRETE	has 1 sto	rage pools capable of
LAN-free data movement a	ind 3 storage	e pools not c	apable of	LAN-free data
movement.		-		

**Note:** This information also applies to the Storage Agent functionality as mentioned in 11.4.1, "Validating a LAN-free environment configuration" on page 103.

This new command replaces the unsupported command SHOW LANFREE, which was introduced in Version 5.2.2 (see 11.3.2, "SHOW LANFREE command" on page 100).

## 3.4.11 NDMP operations

This function is common to all platforms except z/OS.

NDMP operations for backup of NAS file servers have been enhanced to support the following functions:

- Directory-level backup of NAS data, which enables the division of a file system backup operation among several NDMP backup operations as well as several tape drives. This enhancement will reduce backup and restore times.
- NDMP Directory Level Backup will enable Tivoli Storage Manager to back up user created snapshots that are stored as sub-directories, specifically Network Appliance snapshots.

See the following new commands:

DEFINE VIRTUALFSMAPPING

DELETE VIRTUALFSMAPPING

QUERY VIRTUALFSMAPPING

UPDATE VIRTUALFSMAPPING

See the following changed commands:

BACKUP NODE

QUERY FILESPACE

REMOVE NODE

RENAME FILESPACE

RESTORE NODE

See "Using NDMP for Operations with NAS File Servers" in the *IBM Tivoli Storage Manager Administrator's Guide* for more information.

## 3.4.12 Network Appliance SnapLock support

Servers with data retention protection enabled can now exploit the WORM file protection of SnapLock Compliance and Enterprise editions offered by Network Appliance. Volumes in storage pools defined with the parameter RECLAMATIONTYPE=SNAPLOCK are protected in NetApp NearStore storage systems from inadvertent or malicious deletion. The retention date for files stored in these file systems is derived from the attributes of the Tivoli Storage Manager Archive Copy Group.

See the IBM Tivoli Storage Manager Administrator's Guide for more information.

See the following changed commands:

- **DEFINE COPYGROUP**
- **DEFINE DEVCLASS**

DEFINE SPACETRIGGER

**DEFINE STGPOOL** 

**DEFINE VOLUME** 

DELETE VOLUME

QUERY STGPOOL

QUERY VOLUME

UPDATE COPYGROUP

UPDATE DEVCLASS

UPDATE SPACETRIGGER

### 3.4.13 New interface to manage servers: Administration Center

The Administration Center is a Web-based interface that can be used to centrally configure and manage IBM Tivoli Storage Manager Version 5.3 servers. This new interface replaces the administrative Web interface. The Administration Center is installed as an IBM Integrated Solutions Console component. The Integrated Solutions Console allows you to install components provided by multiple IBM applications, and access them.

It makes tasks easier by grouping previously separate tasks together to make a process simpler such as adding hardware or creating new storage pools.

See the *IBM Tivoli Storage Manager Installation Guide* for installation information and "Managing Servers with the New Administration Center" in the *IBM Tivoli Storage Manager Administrator's Guide* for more information.

**Note:** Chapter 23., "Administration Center" on page 187 of this redbook provides further details of this new feature.

## 3.4.14 Server processing control with scripts

Administrators can automate routine server operations. In server scripts, commands can now be processed in serial and parallel. This enables multiple processes to run concurrently, which reduces data transfer time.

See the following new commands:

PARALLEL

SERIAL

See "Automating Server Operations" - "Running Commands in Parallel or Serially" in the *IBM Tivoli Storage Manager Administrator's Guide* for more details. Also, refer to the *Administrator's Reference* for more information on the PARALLEL and SERIAL script commands. Example 3-14 shows the usage in server scripts.

Example 3-14 Usage of PARALLEL and SERIAL in server scripts

```
/*run multiple commands in parallel and wait for them to complete before
proceeding*/
PARALLEL
/*back up four storage pools simultaneously*/
BACKUP STGPOOL PRIMPOOL1 COPYPOOL1 WAIT=YES
BACKUP STGPOOL PRIMPOOL2 COPYPOOL2 WAIT=YES
BACKUP STGPOOL PRIMPOOL3 COPYPOOL3 WAIT=YES
BACKUP STGPOOL PRIMPOOL4 COPYPOOL4 WAIT=YES
```

/\*wait for all previous commands to finish\*/ SERIAL /\*after the backups complete, migrate stgpools simultaneously\*/ PARALLEL MIGRATE STGPOOL PRIMPOOL1 DURATION=90 WAIT=YES MIGRATE STGPOOL PRIMPOOL2 DURATION=90 WAIT=YES MIGRATE STGPOOL PRIMPOOL3 DURATION=90 WAIT=YES MIGRATE STGPOOL PRIMPOOL4 DURATION=90 WAIT=YES /\*wait for all previous commands to finish\*/ SERIAL /\*after migration completes, relcaim storage pools simultaneously\*/ PARALLEL RECLAIM STGPOOL PRIMPOOL1 DURATION=120 WAIT=YES RECLAIM STGPOOL PRIMPOOL2 DURATION=120 WAIT=YES RECLAIM STGPOOL PRIMPOOL3 DURATION=120 WAIT=YES RECLAIM STGPOOL PRIMPOOL4 DURATION=120 WAIT=YES

#### 3.4.15 Multiple Tivoli Storage Manager client nodes

Backup from multiple nodes to be stored as a single target node in the server database is now allowed. With the consolidation of data under a single target node on the server, directories and files can be easily found when restore operations are necessary. It is also no longer necessary for physical machines to share password files, because password management and Tivoli Storage Manager server authentication is now handled by clients (independent of relationships with other nodes).

See "Consolidating Multiple Clients under a Single Client Node Name" in the UNIX *Administrator's Guide* for more information (with an example in the section "Shared Access Sample Configuration").

Also see 19.4.1, "Client node proxy support [option: Asnodename]" on page 162 in this book. More details on this can be found in Appendix A, "Hints and tips" under "Comparison of options virtualnodename/fromnode/asnodename" on page 320.

**Note:** Although Windows has the capability to do this, UNIX is the only *practical* environment where this function would likely be used.

See the following new commands:

GRANT PROXYNODE REVOKE PROXYNODE QUERY PROXYNODE See the following changed commands: QUERY NODE QUERY STATUS

## 3.4.16 Tivoli Storage Manager scheduling flexibility

Tivoli Storage Manager schedule capability now allows for more useful calendar-type administrative and client scheduling. There is now the flexibility to schedule most repetitive items and even some holidays, such as:

- Run on the last Friday of every month.
- ► Run on the first Sunday of every quarter.
- Run on every day in the last week of year.

Here is the syntax for the advanced Scheduling command:

DEFine SCHedule schedule\_name Type=Administrative SCHEDStyle=Enhanced

- MONth=ANY JAn, Feb, ... Dec
- WEEKofmonth = ANY FIrst, Second, Third, FOurth, Last
- DAYOFMonth=ANY Day(-31 to 31)
- DAYofweek=ANY |WEEKDay,WEEKEnd,SUnday,Monday,TUesday,Wednesday,THurs day,Friday,SAturday

Here is an example of how to create an enhanced schedule to run on the Wednesday and Saturday of every week.

- 1. In the Administration Center, open **Policy Domains and Client Nodes** and click the appropriate server.
- 2. Click the Domain Name to display the Standard Properties and expand the **Client Node Schedules** portlet.
- 3. Select Create a Schedule... from the drop down list
- 4. The Create a Schedule wizard will then start as shown in Figure 3-6. Click **Next** to continue.



Figure 3-6 Advanced Schedule - Start Wizard

5. Once you have entered the Schedule name and description enter the file types and any client options as shown in Figure 3-7. Click **Next** to continue.

Create Schedule		?- <b>D</b> ×
<ul> <li>General</li> <li>Select Action Options Select Repetition Options</li> <li>Select Advanced Options</li> <li>Associate Client Nodes</li> <li>Summary</li> </ul>	Select Archive Options         Enter the names of the files the schedule will archive.         *Files to archive         *jpg;*.bmp;*.mp*;*.zip         Client options to use during the archive operation         COMPRESSALWAYS=NO         < Back	

Figure 3-7 Advanced Schedule - Select Archive Options

6. Figure 3-8 illustrates the Select Repetition options. Click **Next** to advance to the next step in the process.

Create Schedule     ✓ General     ✓ Select Action Options     Select Repetition     Options     Select Advanced     Options     Associate Client Nodes     Summary	Select Repetition Options Specify when to start the schedule. Select whether to repeat the schedule, and if so, how to repeat it. Date and time this schedule starts. The schedule uses the time zone of the Tivoli Storage Manager server.  12/8/04 9:47:38 AM C Run once. The schedule only runs at the date and time above. C Repeat hourly (every one or more hours) C Repeat hourly (every one or more hours)
_	© Repeat daily (every one or more days) © Repeat on one or more days of the week © Repeat weekly (every one or more weeks) © Repeat weekly (every one or more months) © Repeat yearly (every one or more years)
	< Back Next ≻ Finish Cancel

Figure 3-8 Advanced Schedule - Repetition Options

7. Once the repetition options have been chosen, you can then go on to the Repeat the Schedule element of the wizard as shown in Figure 3-9. Note that you can choose which weeks or months, thus creating a complex granularity to your schedules which was previously not possible.



Figure 3-9 Advanced Schedule - Repeat the Schedule

8. Next enter the **Schedule priority**, **Schedule Expiration** date if applicable and a time limit if necessary, as shown in Figure 3-10. Click **Next** to proceed to the next step.

Create Schedule	2 [ ]
<ul> <li>✓ General</li> <li>✓ Select Action Options</li> <li>✓ Select Advanced Options</li> <li>→ Select Advanced Options</li> <li>Associate Client Nodes</li> <li>Summary</li> </ul>	Advanced Schedule Options         If two or more schedules are set to start at the same time, the schedule with the highest priority starts first.         Schedule priority (1 has the highest priority)         S         Schedule Expiration         C Schedule expires on the following date         + 10/17/05         You can specify a time limit for the scheduled operation to start. If the operation cannot be started during this time, it will be retried the next time the schedule runs. This time limit does not restrict how long an operation is started, it can run to completion. Specifying a time limit can help manage multiple schedules.         I       Hours
< Back Next > Fi	inish Cancel

Figure 3-10 Advanced Schedule - Advanced Schedule Options

9. You will then move on the final step, associating nodes with the Schedule as Figure 3-11 shows. Select the nodes on the **Associate Client Nodes** page by clicking the check boxes, click **Next**, and the wizard is completed

General	Associate Clien Select client no	<b>t Nodes</b> des to associate	with the schedule.	Ensure that the di-	ent node is set up correctly to run it		
<ul> <li>Select Action Options</li> </ul>	scheduler.						
Options							
Select Advanced		- Go					
Options	Select ^	Name 🔿	Type ^	Platform ^	Description ^		
Associate Client Nodes		JAYKE	Client Node	WinNT	my.bro@free.com,Jayke,0		
summary	<b>V</b>	NIKKI	Client Node	(?)	mrs@scarey.com		
		POLONIUM	Client Node	WinNT	santa@klos.com,Armin,0		
		RAPHAEL	Client Node	WinNT			
		SARAH	Client Node	AIX			
	Page 1 of :	L	Total: 5 Filtered:	5 Displaye <mark>d: 5</mark>	Selected: 3		

Figure 3-11 Advanced Schedule - Associate Nodes

10. You should be presented with the Summary window shown in Figure 3-12.



Figure 3-12 Advanced Schedule - Summary

11.Clicking Finish closes the completed wizard.

Another example is shown in Figure 3-13, where an incremental backup is scheduled to run every first and third Tuesday of the month for one hour. In this example we illustrate the entries shown in the Activity log and the page in the Wizard used to create the schedule.



Figure 3-13 First and third Tuesday schedule

Example 3-15 shows the activity log output from the previous wizard.

tsm: POLONI Date/Time	UM1>q act	s=firstand Message
11/24/2004	16:02:11	ANR2017I Administrator ADMIN issued command: DEFINE SCHEDULE STANDARD firstandthirdtuesday ACTION=INCREMENTAL DESCRIPTION="First and third Tuesday of every month" TYPE=CLIENT SCHEDSTYLE=ENHANCED STARTDATE=11/24/2004 STARTTIME=15:54:40 DAYOFWEEK=TUESDAY WEEKOFMONTH=FIRST,THIRD PRIORITY=5 DURATION=1 DURUNITS=hours (SESSION: 1635)

Example 3-15 Entry in activity log of newly created enhanced schedule

Example 3-16 shows the same schedule listed using the Format=Detailed option.

Example 3-16 Detailed display of newly created enhanced schedule

tsm: POLONIUM1>q sched \* FIRSTANDTHIRDTUESDAY f=d Policy Domain Name: STANDARD Schedule Name: FIRSTANDTHIRDTUESDAY Description: First and third Tuesday of every month Action: Incremental Options: Objects: Priority: 5 Start Date/Time: 11/24/2004 15:54:40 Duration: 1 Hour(s) Schedule Style: Enhanced Period: Day of Week: Tue Month: Any Day of Month: Any Week of Month: First, Third Expiration: Last Update by (administrator): ADMIN Last Update Date/Time: 11/24/2004 16:02:11 Managing profile:

See the *Administrator's Guide* and *Administrator's Reference* for more information.

See the following changed commands:

**DEFINE SCHEDULE** 

QUERY EVENT

QUERY SCHEDULE

**UPDATE SCHEDULE** 

## 3.4.17 Licensing

Licensing in the Version 5.3.0 server has changed from previous versions. Before upgrading from a previous version, delete or rename the nodelock file (for all operating systems except z/OS) or remove existing LICENSE options from the server's option file (z/OS). After installing the Version 5.3.0 server, you must register new licenses. The REGISTER LICENSE command has changed with this version, and its function is currently limited:

- You can register licenses for server components. This includes Tivoli Storage Manager (base), Tivoli Storage Manager Extended Edition, and Tivoli Data Retention Protection.
- You cannot register licenses for components that are licensed on the basis of processors (for example, Tivoli Storage Manager for Mail, Tivoli Storage Manager for Databases, Tivoli Storage Manager for ERP, Tivoli Storage Manager for Hardware, Tivoli Storage Manager for Space Management).

Your license agreement determines what you are licensed to use, even if you cannot use the REGISTER LICENSE command to register all components. You are expected to comply with the license agreement and use only what you have purchased. Use of the REGISTER LICENSE command implies that you agree to and accept the license terms specified in your license agreement.

#### Syntax (for all operating systems except z/OS)

This is the syntax for the REGISTER LICENSE command:

```
REGister LICense FILE=<license_file>
```

The following parameters apply:

FILE - Specifies the name of the enrollment certificate file containing the license to be registered. The specification can contain a wildcard (\*). Enter the complete file name or a wildcard in place of the file name.

Note: The file names are case-sensitive.

To register additional clients, specify the names of the following enrollment certificate files:

- tsmbasic.lic To license base IBM Tivoli Storage Manager.
- tsmee.lic To license base IBM Tivoli Storage Manager Extended Edition. This includes the Disaster Recovery Manager, large libraries, and NDMP.
- dataret.lic To license IBM Tivoli Storage Manager for Data Retention. This is required to enable Data IRetention Protection as well as Expiration and Deletion Suspension (Deletion Hold).

#### Examples (for all operating systems except z/OS)

Now we provide a few examples:

Task: Register Tivoli Storage Manager Extended Edition

Command:

register license file=tsmee.lic

Task: Register all license files using a wildcard.

Command:

register license file=\*.lic

#### Syntax (for z/OS)

This is the syntax for the REGISTER LICENSE command for z/OS

```
REGister LICense <license keyword>
```

**Note:** The REGISTER LICENSE command adds a LICENSE statement to the end of the server options file if it completes successfully. To use this command, ensure that the options file as specified in the server startup JCL (OPT DD statement) is coded with a DISP=MOD parameter, and not DISP=SHR.

The following parameters apply:

- BASICEDITION To license base IBM Tivoli Storage Manager.
- EXTENDEDEDITION To license base IBM Tivoli Storage Manager Extended Edition. This includes the Disaster Recovery Manager and large libraries.
- DATARETENTION To license IBM Tivoli Storage Manager for Data Retention for z/OS. This is required to enable Data Retention Protection as well as Expiration and Deletion Suspension (Deletion Hold).

#### Examples (for z/OS)

Now we provide a few examples:

Task: Register Tivoli Storage Manager Extended Edition

Command:

register license EXTENDEDEDITION

License registration on z/OS can also be done by editing the server options file. See the Administrator's Reference for information on how to edit the options file. The only values allowed with the LICENSE parameter for Tivoli Storage Manager 5.3.0 are BASICEDITION, EXTENDEDEDITION, and DATARETENTION.



## 4

# AIX specific server enhancements

This chapter provides information on the changes introduced on the AIX platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

## 4.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no AIX specific changes to IBM Tivoli Storage Manager Server between 5.1 to 5.1.5.

## 4.2 Changes in server Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no AIX specific changes in IBM Tivoli Storage Manager Server version 5.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook.

## 4.3 Changes in server Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager 5.2 server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no AIX specific changes in IBM Tivoli Storage Manager Server version 5.2.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook.

## 4.4 Changes in server Version 5.3

The following are the latest AIX specific enhancements to the IBM Tivoli Storage Manager 5.3 server.

## 4.4.1 Accurate SAN device mapping

Device IDs within a SAN environment change when a reset or other environmental changes occur. With accurate SAN device mapping, Tivoli Storage Manager can now detect SAN changes and automatically make the appropriate processing changes to the server definitions. If a device's path is altered due to bus resets or other environmental changes to the SAN, Tivoli Storage Manager will perform SAN discovery using the HBA API to find the correct path to the desired target device. Manual updates to the path information are no longer required.

See the following new command:

QUERY SAN

## 4.4.2 Storage agent and library sharing failover

Failover for an AIX HACMP<sup>™</sup> environment has been updated to include failover in a library sharing or storage agent environment. Tivoli Storage Manager can determine which devices need to be reset on startup of the server or storage agent. A target reset will then be performed on only those devices.



## 5

# HP-UX specific server enhancements

This chapter provides information on the changes introduced on the HP-UX platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

## 5.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no HP-UX specific changes to IBM Tivoli Storage Manager between the 5.1 and 5.1.5 versions.

## 5.2 Changes in server Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no HP-UX specific changes in IBM Tivoli Storage Manager Server Version 5.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

## 5.3 Changes in server Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no HP-UX specific changes to the IBM Tivoli Storage Manager at the 5.2.2 level. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

## 5.4 Changes in server Version 5.3

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.
### No changes in this version

There were no HP-UX specific changes to the IBM Tivoli Storage Manager at the 5.3 level. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.



## Linux specific server enhancements

This chapter provides information on the changes introduced on the Linux platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

Prior to IBM Tivoli Storage Manager 5.1.5, Linux was not an officially supported platform.

## 6.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

Linux was introduced to the IBM Tivoli Storage Manager Server family at this level, so this is the first version that was supported for the Linux server platform.

## 6.2 Changes in server Version 5.2

Support for new Linux platforms was introduced at the 5.2 level of IBM Tivoli Storage Manager Server.

### 6.2.1 Linux for pSeries

The Tivoli Storage Manager server for Linux is now supported on pSeries® hardware.

### 6.2.2 Linux for zSeries

The Tivoli Storage Manager server for Linux is now supported on zSeries® hardware.

## 6.3 Changes in server Version 5.2.2

Aside from the common changes to IBM Tivoli Storage Manager for Windows 5.2.2, only one Linux-specific change applies to this version.

### 6.3.1 Disaster Recovery Manager

With this function you can prepare a disaster recovery plan to help you recover your Tivoli Storage Manager servers, clients, and data in the case of a disaster. You can also use the function to manage your offsite recovery media and automate some recovery procedures.

See the *Administrator's Guide* for more information.

See the following new commands:

DEFINE MACHINE

DEFINE MACHNODEASSOCIATION

DEFINE RECMEDMACHASSOCIATION

DEFINE RECOVERYMEDIA

DELETE MACHINE

SET DRMCHECKLABEL

SET DRMCMDFILENAME

SET DRMCOPYSTGPOOL

DELETE MACHNODEASSOCIATION

DELETE RECMEDMACHASSOCIATION

DELETE RECOVERYMEDIA

INSERT MACHINE

MOVE DRMEDIA

PREPARE

QUERY DRMEDIA

QUERY DRMSTATUS

QUERY MACHINE

QUERY RECOVERYMEDIA

QUERY RPFCONTENT

QUERY RPFILE

SET DRMCHECKLABEL

SET DRMCMDFILENAME

SET DRMCOPYSTGPOOL

SET DRMCOURIERNAME

SET DRMDBBACKUPEXPIREDAYS

SET DRMFILEPROCESS

SET DRMINSTRPREFIX

SET DRMNOTMOUNTABLENAME

SET DRMPLANPREFIX

SET DRMPLANVPOSTFIX

SET DRMPRIMSTGPOOL

SET DRMRPFEXPIREDAYS SET DRMVAULTNAME SET LRECLRECOVERYFILE UPDATE MACHINE UPDATE RECOVERYMEDIA

## 6.4 Changes in server Version 5.3

There are only two changes specific to the Linux platform in the IBM Tivoli Storage Manager 5.3 Server version, as described in the following subsections.

### 6.4.1 Accurate SAN device mapping

Device IDs within a SAN environment change when a reset or other environmental changes occur. With accurate SAN device mapping, Tivoli Storage Manager can now detect SAN changes and automatically make the appropriate processing changes to the server definitions.

See the following new command:

QUERY SAN

### 6.4.2 Communications options

There is now a shared memory communications option between the Tivoli Storage Manager server for Linux and the backup-archive client for Linux on the same machine. It can be used to perform backups, archives, restores, and retrieves. You can also enable the shared memory communication protocol in the Linux storage agent for communication with the Linux backup-archive client.

**Note:** While using shared memory, if a message queue has to be created, but the system limit for the maximum number of message queues (MSGMNI) will be exceeded if a message queue is created, the following message will be issued:

ANR9999D shmcomm.c(1598): ThreadId<39> Error from msgget (2), errno = 28

To find the maximum number of message queues allowed on your system, issue the following command:

cat /proc/sys/kernel/msgmni

To increase the maximum number of message queues on your system, issue the following command:

sysctl -w kernel.msgmni=n

Here, n is the maximum number of message queues (MSGMNI) you want to be allowed by the system.

See the Administrator's Reference for more information.



# Sun Solaris specific server enhancements

This chapter provides information on the changes introduced on the Sun Solaris platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

## 7.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no Sun Solaris specific changes to IBM Tivoli Storage Manager between Version 5.1 and Version 5.1.5.

## 7.2 Changes in server Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no Sun Solaris specific changes in IBM Tivoli Storage Manager Server Version 5.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### 7.3 Changes in server Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no Sun Solaris specific changes to the IBM Tivoli Storage Manager server.

### 7.4 Changes in server Version 5.3

There is only one Sun Solaris specific change in the IBM Tivoli Storage Manager 5.3.

### 7.4.1 Accurate SAN device mapping

Device IDs within a SAN environment change when a reset or other environmental changes occur. With accurate SAN device mapping, Tivoli Storage Manager can now detect SAN changes and automatically make the appropriate processing changes to the server definitions.

See the following new command:

QUERY SAN



## OS/400 PASE specific server enhancements

This chapter provides information on the changes introduced on the OS/400 PASE platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

Prior to IBM Tivoli Storage Manager 5.1.5, OS/400 PASE was not an officially supported platform.

**Note:** Support for OS/400 PASE has been discontinued with IBM Tivoli Storage Manager 5.3.

## 8.1 Changes in server Version 5.1.5

This is the first version that was supported for the IBM Tivoli Storage Manager Server OS/400 PASE server platform.

#### No changes in this version

No changes over the previous version have been introduced, since this is the first time OS/400 PASE has been a supported server platform.

## 8.2 Changes in server Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no OS/400 PASE specific changes in IBM Tivoli Storage Manager Server Version 5.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

## 8.3 Changes in server Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

There were no OS/400 PASE specific changes in IBM Tivoli Storage Manager Version 5.2.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### 8.4 Changes in server Version 5.3

The only change in this version is the discontinuation of PASE support.

### 8.4.1 PASE support discontinued

PASE is no longer supported in IBM Tivoli Storage Manager at the 5.3 level. It is suggested that iSeries Linux is the alternative.

# Windows specific server enhancements

This chapter provides information on the changes introduced on the Windows platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

## 9.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no Windows specific changes to IBM Tivoli Storage Manager between Version 5.1 and Version 5.1.5.

## 9.2 Changes in server Version 5.2

Among the changes in IBM Tivoli Storage Manager 5.2, only two were Windows platform specific.

### 9.2.1 Device driver for Windows Server 2003

A new device driver, TSMSCSI, is now supported for Windows Server 2003. The driver is available as 32–bit and 64–bit.

### 9.2.2 IBM Device Driver for 3570, 3590, and IBM LTO devices

**Important:** If you currently use 3570, 3590, or IBM LTO devices, you will need to install the IBMTape driver that supports your device. The Tivoli Storage Manager Device Driver will no longer recognize these devices.

## 9.3 Changes in server Version 5.2.2

Only one change is Windows specific in IBM Tivoli Storage Manager 5.2.2. See Chapter 3, "Common server enhancements" on page 27. for details of further enhancements.

### 9.3.1 DVD support

Tivoli Storage Manager supports DVD library technology for the Plasmon D Series DVD library using removable file device classes.

See the Administrator's Guide for more information.

See the following changed commands: DEFINE DEVCLASS UPDATE DEVCLASS

## 9.4 Changes in server Version 5.3

There are two Windows specific changes in the IBM Tivoli Storage Manager 5.3 server.

### 9.4.1 Communications options

There is now a shared memory communications option between the Tivoli Storage Manager server for Windows and the backup-archive client for Windows. It can be used to perform backups, archives, restores, and retrieves. You can also enable the shared memory communication protocol in the Windows storage agent for communication with the Windows backup-archive client.

See the Administrator's Guide for more information.

See the following changed server option:

COMMMETHOD

### 9.4.2 Increased block size for writing to tape

The maximum transfer length for all host bus adapters has increased. The block size used by the Tivoli Storage Manager server on Windows for writing data to certain types of tape drives has also increased. Increasing the transfer length increases the rate at which data is processed for backups, archives, restores, and retrieves. The maximum supported transfer length is now 256 KB.



## z/OS specific server enhancements

This chapter provides information on the changes introduced on the z/OS platform, for which a current version of the IBM Tivoli Storage Manager server is available, and which have not been described previously in Chapter 3, "Common server enhancements" on page 27.

## 10.1 Changes in server Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no z/OS specific changes to IBM Tivoli Storage Manager between Version 5.1 and Version 5.1.5.

### 10.2 Changes in server Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no z/OS specific changes in IBM Tivoli Storage Manager Server Version 5.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### 10.3 Changes in server Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no z/OS specific changes in IBM Tivoli Storage Manager Server Version 5.2.2. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### 10.4 Changes in server Version 5.3

There were no changes specific to the IBM Tivoli Storage Manager server for this platform. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

### No changes in this version

There were no z/OS specific changes in IBM Tivoli Storage Manager Server Version 5.3. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.



## Common Storage Agent enhancements

This chapter discusses the new features and enhancements delivered in IBM Tivoli Storage Manager Version 5.3 Storage Agent, which are common to all platforms.

In this chapter we also provide information on major additions to IBM Tivoli Storage Manager Storage Agent in Version 5.1.5/5.2/5.2.2.

## 11.1 Changes in Version 5.1.5

These are the common Storage Agent enhancements for this Version.

### No common enhancements for Storage Agents

Changes from IBM Tivoli Storage Manager Version 5.1 to 5.1.5 were limited to Linux. These changes are documented in their respective Platform Specific Chapters.

## 11.2 Changes in Version 5.2

The changes to IBM Tivoli Storage Manager 5.2 covered many areas across many platforms. The most obvious is the change of library sharing and LAN-free upgrade considerations. For additional information, see the corresponding readme file and the corresponding platform specific chapter.

## 11.3 Changes in Version 5.2.2

There were several changes common to all IBM Tivoli Storage Manager 5.2.2 Storage Agents.

### 11.3.1 TCPPORT, TCPADMINPORT, and defaults

The TCPADMINPORT is a new server option for Tivoli Storage Manager 5.2 which defaults to the value 1500. It does NOT default to the same value as the TCPPORT option. If multiple servers are running on a system and one of those servers is using a TCPPORT value of 1500 and if the TCPADMINPORT option is not specified in all of the server option files, a conflict will occur on port 1500. Only the first server to be brought up will be able to use this port. Other servers will fail to communicate on port 1500.

**Note:** The default value has been changed in Version 5.3., see 18.4.5, "Optimized option default values" on page 155.

### 11.3.2 SHOW LANFREE command

The command **SHOW LANFREE** is available from the IBM Tivoli Storage Manager server. The syntax for this command is:

SHOW LANFREE nodename stgagentname

Here:

**nodename** is the name of a client node.

**stgagentname** is the name of a storage agent.

The query will evaluate the destination storage pools for the domain to which this client node is assigned. The policy destinations are evaluated for BACKUP, ARCHIVE, and SPACEMANAGED operations for this node.

When the query processing begins, the following message is issued:

ANR0387I Evaluating node FRED using storage agent STA1 for LAN-free datamovement.

When the query processing completes, the following message is issued summarizing the number of LAN-free and non-LAN-free destinations that were found:

ANR0388I Node FRED using storage agent STA1 has 2 storage pools capable of LAN-free data movement and 4 storage pools not capable of LAN-free data movement.

The **SHOW LANFREE** command will display a table that reports whether or not a destination storage pool for a management class, which this node can use, is capable of LAN-free data movement.

See Example 11-1 showing the output of the SHOW LANFREE command.

Node Name	Storage Agent	Operation	Mgmt Class Name	Destination Name	LAN-Free capable?	Explanation
NODE1	STA1	BACKUP	NOLF	OUTPOOL	No	No available online paths.
NODE1	STA1	BACKUP	NOLF_SW	PRIMARY	No	Destination storage pool is configured for simultaneous write.
NODE1	STA1	BACKUP	STANDARD	SHRPOOL	Yes	
NODE1	STA1	ARCHIVE	NOLF	OUTPOOL	No	No available online paths.
NODE1	STA1	ARCHIVE	NOLF_SW	PRIMARY	No	Destination storage pool is configured for simultaneous write.
NODE1	STA1	ARCHIVE	STANDARD	SHRPOOL	Yes	

Example 11-1 Output from the command SHOW LANFREE

A few other messages may also be issued. The first is:

ANR0387W Node NODE1 has data path restrictions.

This message is issued if this client node has its data read path or data write path set such that it would prevent LAN-free data movement.

Also, if this command is issued from an administrative client, the server will also try to contact the storage agent using the **SERVER PING** command. If it is successfully able to contact the storage agent, the following message is displayed:

ANR1706I Ping for server 'STA1' was able to establish a connection.

If the server did not successfully contact the storage agent, the following message is displayed:

ANR1705W Ping for server 'STA1' was not able to establish a connection.

**Note:** SHOW LANFREE has been superseded, in the latest version of IBM Tivoli Storage Manager, by the command VALIDATE LANFREE as described in 3.4.10, "Validating a LAN-free environment configuration" on page 55.

### 11.3.3 Storage Agent compatibility and support

The Tivoli Storage Manager support for storage agents has been modified. More versions and levels are now compatible with each other than before. Previously, version and level had to be identical.

For further information, see the relevant readme file.

### 11.3.4 Changed settings no longer require Storage Agent restart

In most cases, it is no longer necessary to halt and restart a LAN-free Storage Agent to pick up changes in the Data Manager server.

Further details on this are available in Appendix A, "Hints and tips" in the section, "Reasons for restarting a Storage Agent" on page 327.

## 11.4 Changes in Version 5.3

IBM Tivoli Storage Manager 5.3 has introduced many improvements, most of which are common to all supported storage agent platforms. See the appropriate storage agent specific chapter for details regarding a specific platform.

### 11.4.1 Validating a LAN-free environment configuration

The unsupported command SHOW LANFREE, which was introduced in Version 5.2.2 (see 11.3.2, "SHOW LANFREE command" on page 100), has changed into the official command VALIDATE LANFREE.

For more information and an example of the VALIDATE LANFREE command, also see 3.4.10, "Validating a LAN-free environment configuration" on page 55 in this book.

### 11.4.2 Limitations when using LAN-free and simultaneous write

In the Administration Center, select the server you wish to work on from the devices menu by marking the appropriate radio button. Select **View storage pools** from the drop down menu and click **Go**.

Select the storage pool you wish to modify by clicking in the appropriate line and select **Modify Storage Pool...** from the drop down menu.

Select Advanced Options from the Menu.

Define a copy storage pool by selecting it from the **Copy storage pools for simultaneous write** drop downs as shown in Figure 11-1.

BACKUPLANFREE Properties	(POLONIUM1) ? = 🗆 >
General Migration Media management Volumes Advanced options	Advanced Options         You can specify how files in the storage pool can be accessed by client nodes and server processes.         Access         Read-write         Maximum file size to accept from client nodes         © No limit         Maximum size         Image: Image pool and up to the primary storage pool and up to three copy storage pools simultaneously. If you select more than one copy storage pool, each one must be unique.         Copy storage pools for simultaneous write         Image: Image I
	☑ Enable data validation using a cyclic redundancy check
OK Apply Cancel	

Figure 11-1 Storage Pool properties Advanced Options

Check the result with the Admin command **validate lanfree** as shown in Example 11-2.

Example 11-2 Validate lanfree with copystoragepool assigned to primary pool

```
tsm: POLONIUM1>validate lanfree crete sa crete
ANRO387I Evaluating node CRETE using storage agent SA CRETE for LAN-free data
movement.
Node Storage Operation Mgmt Class Destination LAN-Free Explanation
              Name Name capable?
Name Agent

        CRETE SA_CRETE BACKUP
        MC_FS_LAN-
        BACKUPLANFR-
        No
        Destination storage

        FREE
        EE
        pool is configured

                                                        pool is configured for simultaneous
                                                         write.
                        STANDARD BACKUPPOOL No
CRETE SA CRETE BACKUP
                                                          Destination storage
                                                           pool is DISK.
                        MC FS LAN- ARCHIVELANF- Yes
CRETE SA CRETE ARCHIVE
                         FREE
                                    REE
CRETE SA CRETE ARCHIVE
                        STANDARD ARCHIVEPOOL No
                                                          Destination storage
                                                          pool is DISK.
ANR1705W Ping for server 'SA CRETE' was not able to establish a connection.
ANRO3881 Node CRETE using storage agent SA CRETE has 1 storage pools capable of
LAN-free data movement and 3 storage pools not capable of LAN-free data
movement.
```

You are no longer able to perform a LAN-free backup or restore with the modified storage pool because simultaneous write support takes precedence over LAN-free support.

### 11.4.3 Multiple file system support for FILE device type

IBM Tivoli Storage Manager server improvements to sequential-access FILE device type and random-access DISK device class storage requires that the storage agent be able to access newly created FILE volumes.

See the Installing and Configuring Tape-Library and File-Device Sharing Environments chapter in the *Storage Agent User's Guide* for detailed information.

### 11.4.4 Multi-session no-query restore for LAN-free path

When performing a no-query restore, the Tivoli Storage Manager server builds a list of files to restore and sends data to the client while continuing to build the list. This allows the restore to be restarted if interrupted.

The location of the volume, and whether or not the storage agent can access the volume, will determine how the data is handled. When the volume can be mounted on a shared device that the storage agent can access, the data is read from the volume by the storage agent and sent to the client. When the volume cannot be mounted on a shared device that the storage agent can access, the data is read is read from the volume by the storage agent and sent to the client. When the volume cannot be mounted on a shared device that the storage agent can access, the data is read from the volume by the server and sent directly to the client.

The client then begins additional sessions: some to the storage agent for the volumes that are LAN-free enabled, and some sessions to the server for those volumes that are not LAN-free enabled.

### 11.4.5 LANFREETCPServeraddress option

The LANFREETCPServeraddress is a new client option that specifies the TCP/IP address for a IBM Tivoli Storage Manager Storage Agent. Use this option when you specify LANFREECommethod=TCPIP for communication between the Tivoli Storage Manager client and Storage Agent. Overriding the default for this option is useful when configuring LAN-free in an environment where the client and storage agent are running on different systems. You can obtain this Storage Agent address from your administrator.

### **Supported Clients**

This option is valid for all UNIX and Windows clients, except the 64-bit Windows Server 2003.

Figure 11-2 shows the components and connections that we used in our test environment.



Figure 11-2 Components and connections in our LAN-free environment

In our Example, there are two Client Nodes, KATHY and CRETE, registered on server POLONIUM1. The Storage Agent SA\_CRETE is defined as a Server on Server POLONIUM1. Tivoli Storage Manager Client Crete 1 and Storage Agent SA\_CRETE are running on the same system and are connected via Shared Memory. Storage Agent SA\_CRETE has a SAN connection to the tape drives. The client CRETE can send its data LAN-free via the Storage Agent to the attached tape drives.

There is no longer a requirement for the client node and the storage agent to run on the same system. They can run on different systems, connected via LAN with the storage agent acting as a remote storage agent for the node. In this case it is possible for the node KATHY to send its data via LAN to the Storage Agent which then sends the data via SAN to the storage device. The advantage of this setup is that it is possible to balance the workload between server and storage agent. Example 11-3 shows the options that we put in the options file dsm.sys of our AIX client.

Example 11-3 Configuration of the client options file (dsm.sys) for CRETE1

ENABLELanfree yes LANFREECommmethod sharedmem LANFREEShmport 1610 To check the definitions, use the command **validate lanfree** as shown in Example 11-4.

Example 11-4 Check the LAN-free configuration for Node CRETE

```
tsm: POLONIUM1>validate lanfree crete sa crete
ANRO387I Evaluating node CRETE using storage agent SA CRETE for LAN-free data
movement.
Node Storage Operation Mgmt Class Destination LAN-Free Explanation
Name Agent Name Name capable?
CRETE SA_CRETE BACKUP MC_FS_LAN- BACKUPLANFR- Yes
                    FREE EE
CRETE SA_CRETE BACKUP
                    STANDARD BACKUPPOOL No Destination storage
                                              pool is DISK.
CRETE SA CRETE ARCHIVE
                    MC FS LAN- ARCHIVELANF- Yes
                     FREE REE
                    STANDARD ARCHIVEPOOL No
CRETE SA CRETE ARCHIVE
                                                Destination storage
                                                 pool is DISK.
ANR1706I Ping for server 'SA CRETE' was able to establish a connection.
ANRO3881 Node CRETE using storage agent SA CRETE has 2 storage pools capable of
LAN-free data movement and 2 storage pools not capable of LAN-free data
movement.
```

Example 11-5 shows how the LAN-free functionality has to be defined, if the Node and Storage Agents are running on different systems.

Example 11-5 Configuration in Client options file for LANFREETCPServeraddress

```
ENABLELANFREE YES
lanfreecommmethod tcpip
lanfreetcpserver crete
lanfreetcpport 1600
```

Check the correct definitions again using **validate lanfree** as shown in Example 11-6.

Example 11-6 Check the LAN-free configuration for Node KATHY

tsm: POLONIUM1>validate lanfree kathy sa\_crete ANRO387I Evaluating node KATHY using storage agent SA\_CRETE for LAN-free data movement.

 Node
 Storage
 Operation
 Mgmt Class
 Destination
 LAN-Free
 Explanation

 Name
 Agent
 Name
 Name
 capable?

 ---- ---- ---- ---- 

 KATHY
 SA\_CRETE
 BACKUP
 MC\_FS\_LAN BACKUPLANFR Yes

 FREE
 EE
 EE
 EE

KATHY	SA_CRETE	BACKUP	STANDARD	BACKUPPOOL	No	Destination storage pool is DISK.
KATHY	SA_CRETE	ARCHIVE	MC_FS_LAN- FREE	ARCHIVELANF- REE	Yes	
KATHY	SA_CRETE	ARCHIVE	STANDARD	ARCHIVEPOOL	No	Destination storage pool is DISK.
ANR170	)6I Ping	for server	'SA_CRETE'	was able to	establish a	a connection.
ANR038	38I Node	KATHY using	g storage ag	gent SA CRETE	has 2 stor	rage pools capable of
LAN-fr	ree data	movement ar	nd 2 storage	e pools not ca	apable of L	AN-free data
moveme	nt.					

This is the result of the backup operation of node CRETE and node KATHY. See Example 11-7 for details.

Example 11-7 Storage Agent Console Log

ANR0900I Processing options file dsmsta.opt. ANR4726I The ICC support module has been loaded. ANR8200I TCP/IP driver ready for connection with clients on port 1600. ANR8285I Shared Memory driver ready for connection with clients on port 1610 ANRO408I Session 2 started for server POLONIUM1 (Windows) (Tcp/Ip) for event logging. ANRO408I Session 3 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANR8920I Initialization and recovery has ended for shared library TSMLIB01. ANR0993I Server initialization complete. ANRO916I TIVOLI STORAGE MANAGER distributed by Tivoli is now ready for use. TSM:SA CRETE> ANRO400I Session 9 started for node CRETE (AIX) (ShMem). ANR0408I Session 10 started for server POLONIUM1 (Windows) (Tcp/Ip) for storage agent. ANRO408I Session 11 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANRO409I Session 11 ended for server POLONIUM1 (Windows). ANRO408I Session 12 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANR0409I Session 12 ended for server POLONIUM1 (Windows). ANR83371 LTO volume ABA928L1 mounted in drive DRIVEO1 (/dev/rmt0). ANR0511I Session 9 opened output volume ABA928L1. ANR0514I Session 9 closed volume ABA928L1. AANRO403I Session 9 ended for node CRETE (AIX). ANRO408I Session 17 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANR8336I Verifying label of LTO volume ABA928L1 in drive DRIVE01 (/dev/rmt0). ANR8468I LTO volume ABA928L1 dismounted from drive DRIVEO1 (/dev/rmt0) in librarv TSMLIB01. ANR0409I Session 17 ended for server POLONIUM1 (Windows).

ANRO406I Session 39 started for node KATHY (WinNT) (Tcp/Ip 9.1.38.50(1924)). ANR0408I Session 40 started for server POLONIUM1 (Windows) (Tcp/Ip) for storage agent. ANRO408I Session 41 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANR0409I Session 41 ended for server POLONIUM1 (Windows). ANR8337I LTO volume ABA928L1 mounted in drive DRIVE01 (/dev/rmt0). ANR0511I Session 39 opened output volume ABA928L1. ANR0514I Session 39 closed volume ABA928L1. ANR0409I Session 40 ended for server POLONIUM1 (Windows). ANR0403I Session 39 ended for node KATHY (WinNT). ANRO408I Session 49 started for server POLONIUM1 (Windows) (Tcp/Ip) for library sharing. ANR8336I Verifying label of LTO volume ABA928L1 in drive DRIVE01 (/dev/rmt0). ANR8468I LTO volume ABA928L1 dismounted from drive DRIVE01 (/dev/rmt0) in library TSMLIB01. ANRO409I Session 49 ended for server POLONIUM1 (Windows).

As shown in the previous Example 11-7, the client CRETE starts a communication session via shared memory with the storage agent (Session 9). The client KATHY starts a communication session via TCP/IP with the storage agent (Session 39). The storage agent establishes many communication sessions with the IBM Tivoli Storage Manager Server for library sharing.

The data from KATHY was transmitted to the remote storage agent via LAN and from the storage agent to a storage pool LAN-free.



## AIX specific Storage Agent enhancements

This chapter provides information on the changes introduced on the AIX platform which have not been described in Chapter 11, "Common Storage Agent enhancements" on page 99.

## 12.1 Changes in Storage Agent Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

### No changes in this version

No features have been added or modified for this platform.

## 12.2 Changes in Storage Agent Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

### No changes in this version

No features have been added or modified for this platform.

## 12.3 Changes in Storage Agent Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

## 12.4 Changes in Storage Agent Version 5.3

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

### No changes in this version

No features have been added or modified for this platform.
# 13

## HP-UX specific Storage Agent enhancements

This chapter provides information on the changes introduced on the HP-UX platform which have not been described in Chapter 11, "Common Storage Agent enhancements" on page 99.

#### 13.1 Changes in Storage Agent Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 13.2 Changes in Storage Agent Version 5.2

No changes over the previous version have been introduced with this version of the IBM Tivoli Storage Manager Storage Agent for HP-UX. See Chapter 3, "Common server enhancements" on page 27 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 13.3 Changes in Storage Agent Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 13.4 Changes in Storage Agent Version 5.3

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

# 14

## Linux specific Storage Agent enhancements

This chapter provides information on the changes introduced on the Linux platform which have not been described in Chapter 11, "Common Storage Agent enhancements" on page 99.

Note: The Storage Agent 5.1 for Linux first became available October 2002.

#### 14.1 Changes in Storage Agent Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

Linux was introduced to the IBM Tivoli Storage Manager Storage Agent family at this level, so this is the first version that was supported for the Linux Storage Agent platform.

#### 14.2 Changes in Storage Agent Version 5.2

Support for new Linux platforms was introduced at the 5.2 level of IBM Tivoli Storage Manager Storage Agent.

#### 14.2.1 Linux for pSeries

The Tivoli Storage Manager Storage Agent for Linux is now supported on pSeries® hardware.

#### 14.2.2 Linux for zSeries

The Tivoli Storage Manager Storage Agent for Linux is now supported on zSeries® hardware.

#### 14.3 Changes in Storage Agent Version 5.2.2

No changes over the previous version have been introduced with this version of the IBM Tivoli Storage Manager Storage Agent for Linux.

#### No changes in this version

No features have been added or modified for this platform.

#### 14.4 Changes in Storage Agent Version 5.3

In addition to the extension of the supported Linux distributions, there is only the new support of the Shared Memory communication method.

#### 14.4.1 Supported Linux platforms and kernel dependencies

**Note:** When you are in a library sharing or LAN-free environment, Version 5.3 and above of the Tivoli Storage Manager Server and Storage Agent are not backwards compatible with Version 5.2 and below of the Server and Storage Agent. To ensure compatibility, upgrade all Servers and Storage Agents to Version 5.3 in a library sharing or LAN-free environment.

For the correct Linux kernel levels supported by the corresponding device driver, see the IBM Tivoli Storage Manager Web site at:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

for Linux environments that are supported by the Tivoli Storage Manager device driver, and for basic install packages. At this Web Site, under Other Resources, select Linux, then under Linux Specific Notes®, select IBM Tivoli Storage Manager Supported Linux Kernels

**Attention:** For requirements, supported devices, client install packages, and fixes, go to the IBM Tivoli Storage Manager Web site at:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

After you have installed IBM Tivoli Storage Manager and before you customize it for your use, go to the IBM Tivoli Storage Manager Web site. Download and apply any applicable fixes.

For a brief overview of the supported Linux distributions, see the *Storage Agent User's Guide*.

#### 14.4.2 Communications options

There is now a shared memory communications option between the Tivoli Storage Manager Storage Agent for Linux<sup>™</sup> and the backup-archive client for Linux. Shared Memory provides better performance than the TCP/IP protocol. See the *IBM Tivoli Storage Manager V5.3 for SAN for Linux Storage Agent User's Guide*, GC23-4693-03 for more information.



# 15

## Sun Solaris specific Storage Agent enhancements

This chapter provides information on the changes introduced on the SUN Solaris platform, for which a current version of the IBM Tivoli Storage Manager Storage Agent is available, and which have not been described in Chapter 11, "Common Storage Agent enhancements" on page 99.

#### 15.1 Changes in Storage Agent Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 15.2 Changes in Storage Agent Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 15.3 Changes in Storage Agent Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 15.4 Changes in Storage Agent Version 5.3

No changes over the previous version have been introduced with this version of the IBM Tivoli Storage Manager Storage Agent for Sun Solaris.

#### No changes in this version

No features have been added or modified for this platform.

# 16

## Windows specific Storage Agent enhancements

This chapter provides information on the changes introduced on the Windows platform, for which a current version of the IBM Tivoli Storage Manager Storage Agent is available, which have not been described in Chapter 11, "Common Storage Agent enhancements" on page 99.

#### 16.1 Changes in Storage Agent Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 16.2 Changes in Storage Agent Version 5.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 16.3 Changes in Storage Agent Version 5.2.2

There were no changes specific to the IBM Tivoli Storage Manager Storage Agent for this platform. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### No changes in this version

No features have been added or modified for this platform.

#### 16.4 Changes in Storage Agent Version 5.3

Only one change is Windows specific in IBM Tivoli Storage Manager 5.3. See Chapter 11, "Common Storage Agent enhancements" on page 99 of this redbook for further details.

#### 16.4.1 Communications Options

Shared Memory provides better performance than the TCP/IP protocol when the client and Storage Agent are running on the same system. See the *IBM Tivoli Storage Manager V5.3 for SAN for Windows Storage Agent User's Guide*, GC32-0785-03 for more information.

# 17

## z/OS specific Storage Agent enhancements

Until Version 5.2 there was no specific solution for LAN-free support of clients for an IBM Tivoli Storage Manager running on z/OS.

Compared with other operating systems, LAN-free data movement on the z/OS platform is more complex because it requires an additional server and a slightly different configuration. The complexity stems largely from the lack of drive sharing between channel attached z/OS and SAN attached Open System platforms.

In a typical LAN-free implementation with Windows and UNIX platforms, the IBM Tivoli Storage Manager server acts as both the data manager and library manager. In a z/OS LAN-free configuration the server cannot act as a library manager because it does not currently implement library sharing support as it exists on Windows and UNIX IBM Tivoli Storage Manager servers.

For z/OS LAN-free, you must install and configure a UNIX or Windows IBM Tivoli Storage Manager server to act as a library manager for library sharing when using an IBM 3494. If a Library Station controlled StorageTek library and related drives are used, then an External Library configuration is required. External Library support uses an External Library Manager (ELM) as provided by third party vendors.

#### 17.1 Changes in Storage Agent Version 5.1.5

The Storage Agent for z/OS was not available until Version 5.2 of IBM Tivoli Storage Manager.

#### No changes in this version

This feature was not available in this version.

#### 17.2 Changes in Storage Agent Version 5.2

z/OS was introduced to the IBM Tivoli Storage Manager function for LAN-free data transfer as supported server platform. There are many differences in the way LAN-free for z/OS works.

#### 17.3 Changes in Storage Agent Version 5.3

With the IBM Tivoli Storage Manager Server Version 5.3, there are several enhancements in the usage of shared Libraries and external library manager.

#### 17.3.1 LAN-free details

This section covers the details for the LAN-free enhancements.

#### z/OS Shared Library support

Limitations: If the Primary Library Manager is unavailable when a Storage Agent is loaded with Policy applicable to LAN-free, the Storage Agent will continue the LAN-free storage operation until the Library Client function on the Storage Agent attempts to contact the Library Manager at which point the client operation will complete unsuccessfully. For successful LAN-free operational support, the Library Manager nominated as the Primary Library Manager for the shared library must be available and properly configured.

#### z/OS LAN-free Volume selection

Limitations: SCRATCH tape mounts are not supported in z/OS LAN-free configurations.

For LAN-free volume selection to satisfy a Storage Agent request for a target volume, the volume must have first been written to by the z/OS Version 5.2 Tivoli Storage Manager server at least once. Once a volume entry has been recorded in the z/OS Tivoli Storage Manager server database as a Version 5.2 z/OS volume, the volume becomes eligible for LAN-free Storage Agent use.

When volumes transition from filled or filling to empty, the volume remains eligible for LAN-free volume selection. It becomes imperative that volumes destined for LAN-free storage requests be DEFINEd rather than allowing the z/OS Tivoli Storage Manager server to allocate a SCRATCH volume when populating a LAN-free storage pool.

DEFINEd volumes remain in the storage pool when emptied thus making the volume a candidate for LAN-free volume acquisition.

Figure 17-1 shows how the components work together in a z/OS environment.



Figure 17-1 LAN-free data movement for z/OS



# Part 3

## IBM Tivoli Storage Manager client enhancements

This part of the book describes common and specific client enhancements for UNIX, Windows, Netware, and MAC OS X.



# 18

## Common client enhancements

This chapter provides information on the new features and enhancements delivered in each of the platforms for which a current version of the IBM Tivoli Storage Manager client is available.

Platform specific enhancements are described in the following chapters.

**Note:** Please refer to the *IBM Tivoli Storage Manager Backup-Archive Clients Installation and User's Guide* for each supported client platform, for more detailed information about the changes or new features.

#### 18.1 Changes in Version 5.1.5

The following changes for 5.1.5 have been introduced on the UNIX and Windows platforms but not on Netware or Mac OS X.

#### 18.1.1 New option to preserve last access date of files

For backup and archive operations, you can use the *preservelastaccessdate* option to specify whether the client should reset the last access dates of backed up or archived files to their original value. The default behavior is to not reset the last access date.

Any application that accesses a file may implicitly cause that file's last access date to change to the time that the application accesses it. This is a function of the file system, not the application. Because of this, when the client backs up or archives a file, it may trigger an update to the file's last access date. This can cause problems for other applications such as Storage Resource Management (SRM), whose processing relies on accurate last access dates.

**Note:** This option requires extra processing time during backup and archive for each file that is sent to the Tivoli Storage Manager server, so it should only be enabled when necessary.

#### 18.1.2 Enhanced domain processing

Domain processing is enhanced to allow you to include and exclude items from the domain. Previous versions of the Tivoli Storage Manager only allowed you to include items in the domain.

#### Windows

The commands listed in Example 18-1 will each process all local drives except for the C: drive and systemobject, systemstate, or systemservices domains.

Example 18-1 Some excludes from domain option in Windows

```
domain ALL-LOCAL -c: -systemobject
domain ALL-LOCAL -c: -systemstate
domain ALL-LOCAL -c: -systemservices
```

#### UNIX

Example 18-2 will process all local file systems except for the /home file system:

Example 18-2 Excludes from domain option in UNIX

domain ALL-LOCAL -/home

#### 18.1.3 Globally unique identifier (GUID)

The globally unique identifier (GUID) associates a client node with a host system. When you install the Tivoli software, the **tivguid** program is run to generate a GUID which is stored in the Windows Registry on a Windows NT system and in the /etc/tivoli directory on UNIX and Linux systems. The GUID for a client node on the server can change if the host system machine is corrupted, if the Windows Registry entry or in UNIX the file entry is lost, or if a user uses the same node name from different host systems. You can perform the following functions from the command line:

- Create a new GUID
- View the current GUID
- ► Write a specific value
- Create another GUID even if one exists.

The globally unique identifier can be displayed with the administrative command **query node f=dv** as shown in Example 18-3.

```
Example 18-3 Output of the command query node
```

tsm: POLONIUM1>q node crete f=d

Node Name: CRETE Platform: AIX Client OS Level: 5.2 Client Version: Version 5, Release 3, Level 0.0

Globally Unique ID: ed.a0.a5.8c.3e.3a.11.d9.86.e4.08.63.09.01.27.bf

#### 18.1.4 Enhanced query backup and query archive commands

If you use the *detail* option with the **query archive** or **query backup** commands, the client displays the following additional information:

- Last modification date
- Last access

Next, Example 18-4 and Example 18-5 show lists of all files backed up or archived, and using the detail option, they display the last modification date and the last access date of each file.

Example 18-4 List backed up files with last modification and last access date

tsm> q backup -	detail /opt/*			
Si	ze Backup	Date Mgmt	Class A/I File	
512	B 11/24/04	09:11:37 MC_FS	A /opt/	
	Modified: 11/2	23/04 17:37:20	Accessed: 11/23/04	17:37:42
512	B 11/24/04	09:11:37 MC_FS	A /opt/IBMinv	scout
	Modified: 06/2	23/04 10:37:11	Accessed: 06/23/04	10:37:11
512	B 11/24/04	09:11:37 MC_FS	A /opt/Tivoli	
	Modified: 11/2	23/04 13:31:49	Accessed: 11/23/04	15:58:53
512	B 11/24/04	09:11:37 MC_FS	A /opt/csm	
	Modified: 11/2	23/04 17:37:25	Accessed: 11/23/04	17:37:42
512	B 11/24/04	09:11:37 MC_FS	A /opt/diagno:	stics
	Modified: 07/0	07/04 18:30:20	Accessed: 07/07/04	18:30:20
512	B 11/24/04	09:11:37 MC_FS	A /opt/freewa	re
	Modified: 11/2	23/04 13:49:34	Accessed: 11/23/04	15:58:53
512	B 11/24/04	09:11:37 MC FS	A /opt/hsc	
	Modified: 11/2	23/04 17:37:20	Accessed: 11/23/04	17:37:20
512	B 11/24/04	09:11:37 MC_FS	A /opt/lost+f	ound
	Modified: 11/2	23/04 13:30:16	Accessed: 11/23/04	15:58:53
512	B 11/24/04	09:11:37 MC FS	A /opt/pssp t	o csm
	Modified: 07/0	07/04 18:31:02	Accessed: 07/07/04	18:31:02

Example 18-5 List archived files with last modification and last access date

tsm> q archive	-detail /tmp/	*			
S	ize Archive Da	ate - Time	File - Expires	on – Descr	ription
2,048	B 11/25/04	15:35:09	/tmp/ 11/25/05	archive	before
installation o	fisc				
	Modified: 11,	/25/04 15:3	1:37 Accessed:	11/25/04	15:33:23
512	B 11/25/04	15:35:09	/tmp/.X11-unix	11/25/05	archive
before install	ation of isc				
	Modified: 11	/25/04 09:3	0:46 Accessed:	11/25/04	15:33:23
512	B 11/25/04	15:35:09	/tmp/.oslevel.d	atafiles 1	1/25/05
archive before	installation o	of isc			
	Modified: 11	/25/04 14:2	0:58 Accessed:	11/25/04	15:33:23
512	B 11/25/04	15:35:09	<pre>/tmp/ISC_TEMP 1</pre>	1/25/05	archive
before install	ation of isc				
	Modified: 11,	/25/04 14:2	1:47 Accessed:	11/25/04	15:33:23
512	B 11/25/04	15:35:09	/tmp/aaah3y_ya	11/25/05	archive
before install	ation of isc				
	Modified: 11,	/24/04 08:2	3:03 Accessed:	11/25/04	15:33:24
512	B 11/25/04	15:35:09	/tmp/aaalbrzUa	11/25/05	archive
before install	ation of isc				

#### 18.2 Changes in Version 5.2

The following common changes for IBM Tivoli Storage Manager Version 5.2 Clients have been introduced.

#### 18.2.1 Backing up files from one or more file spaces

You can use the **backup group** command to create and back up a group containing a list of files from one or more file spaces to a virtual file space on the Tivoli Storage Manager server. A group backup allows you to create a consistent point-in-time backup of a group of files that are managed as a single logical entity.

- ► All objects in the group are assigned to the same management class.
- Existing *exclude* statements for any files in the group are ignored.
- ► All objects in the group are exported together.
- All objects in the group are expired together as specified in the management class. No objects in a group are expired until all other objects in the group are expired, even when another group they belong to gets expired.
- If you are performing full and differential group backups to a sequential device, during a restore the data will be in no more than two locations. To optimize restore time, perform periodic full backups to back up the data to one location on the sequential media.
- During a full group backup, all objects in the filelist are sent to the server. During a differential group backup, only data that has changed since the last full backup is sent to the server. Objects in the filelist that have not changed since the last full backup are assigned as members of the differential group backup. This data is not resent to the server, reducing backup time.

**Tip:** Using the filelist does not allow for wildcards. You can ease the pain of defining a filelist by creating it in Windows, for example, by using the **dir** command:

dir c:\lotus /B /S > c:\temp\dsmfilelist.txt

One scenario, where group backups can be used, is backing up several directories and/or filesystems that have dependencies and need to be restored in a consistent state. This could be necessary for an application with data and configuration files that need to be in a consistent state.

Another example, useful for creating group backups, is using a filelist in conjunction with a backup set. By using a filelist and limiting the backup to only the files really needed, a compact backup set can be created that is small enough to fit on a single CD or DVD.

Table 18-1 compares differential and incremental backup grouping differences.

Differential backup/restore	Incremental backup/restore
Full and Differential are separate object types that can be queried and restored.	Not applicable.
Query group, and restore with the –pick option, will show multiple active entries (FULL and DIFF) because the two object types are independent; one does not expire the other.	Query file and restore with the -pick option, will show a single active instance of a file.
All changes since the last full backup are added to the differential.	Just changes since the last full OR incremental backup are sent.
Unchanged files are assigned to the differential.	
Just the volumes containing the last full backup and the last differential backup are needed for a full restore.	All the volumes containing the last full backup and all subsequent incremental backups are needed for a full restore.

Table 18-1 Overview of backup grouping differences

#### Commands used to manage a backup group

The following commands can be used:

- QUERY GROUP
- DELETE GROUP
- RESTORE GROUP
- QUERY FILESPACE

Note: If any file in the group backup fails, the entire group backup will fail.

#### 18.2.2 External snapshot provider support

Use the *snapshotroot* option with the **incremental**, **selective**, or **archive** commands in conjunction with a third-party application that provides a snapshot of a logical volume, to associate the data on the local snapshot with the real file space data that is stored on the Tivoli Storage Manager server. The *snapshotroot* option does not provide any facilities to take a volume snapshot, only to manage data created by a volume snapshot.

#### 18.2.3 Enhancements to the Web client interface

The following functions are now supported in the Tivoli Storage Manager Web client interface:

Access Another Node	Displays the backup versions and archive copies of another node. You can then restore the backup versions or retrieve the archives from the other user to your workstation. <i>You must have authorization to</i> <i>access the stored data of another node.</i>
Node Access List	Allows you to authorize other users to access your backup versions and archive copies.
View Policy Information	Displays storage management policy information for your node.

**Tip:** Examples of the use of Access Another Node and Node Access List are shown in Appendix A, "Hints and tips", in the section "Perform a restore of another node on your own client" on page 333 of this book.

#### View Policy Information

In order to view the policy information of the current node, select **Utilities**  $\rightarrow$  **View Policy Information** from the Web client interface, which then displays the policy information as shown Figure 18-1.

🖻 Policy	Information	
1	Display Po	licy Information
	Information for server: POLC Domain:	STANDARD
	Active Policy Set:	STANDARD
	Activation Date:	11/15/2004 14:11:47
	Default Mgmt Class:	STANDARD
	Management Class:	STANDARD
	Management Class Name: Description: Copy Group Copy Group Name: Copy Type: Copy Frequency: Versions Data Exists: Versions Data Deleted: Retain Extra Versions:	STANDARD Installed default managemer STANDARD Backup 0 day(s) 2 version(s) 1 version(s) 30 day(s)
		Help

Figure 18-1 Viewing Policy Information

#### 18.2.4 Enhanced firewall security

Security for backup and restore operations and Tivoli Storage Manager administrative functions is enhanced to allow the Tivoli Storage Manager server to control whether the server or client initiates sessions through a firewall. Use the *sessioninitiation* option to control whether the server or client initiates sessions through a firewall. The default is that the client initiates sessions. You can use this option with the **schedule** command.

Both the server and client can specify a separate TCP/IP port number which the server can poll for requests for administrative client sessions, allowing secure administrative sessions within a private network. Use the *tcpadminport* option to achieve this.

Note: The *tcpadminport* defaults to port 1500.

Starting with Version 5.3, if this option is not specified, the default value is the value of the *tcpport* option (see 18.4.5, "Optimized option default values" on page 155).

#### 18.2.5 Displaying options and settings via the command line

Use the **QUERY OPTIONS** command to display all or part of your options and their current settings. This command accepts an argument to specify a subset of options. The default is to display all options, as shown in Example 18-6.

Example 18-6 QUERY OPTIONS tsm> q opt ACTIVATEKEY: YES AFSBACKUPMNTPNT: YES ALLOWWILDCARDCH: NO ARCHSYMLINKASFILE: YES ASNODENAME: AUTOFSRENAME: PROMPT AUTOMOUNT: BACKUPREGISTRY: YES CANDIDATESINTERVAL: 1 CASESENSITIVEAWARE: NO CHANGINGRETRIES: 4 CHECKFORORPHANS: NO CHECKTHRESHOLDS: 5 CLUSTERDISKSONLY: YES CLUSTERNODE: NO COMMMETHOD: TCP/IP COLLOCATEBYFILESPEC: NO COMMRESTARTDURATION: 60 COMMRESTARTINTERVAL: 15 COMPRESSALWAYS: YES COMPRESSION: NO DATEFORMAT: 1 **DEFAULTSERVER:** DFSBACKUPMNTPNT: YES DIRMC: DEFAULT DISKBUFFSIZE: 32768 DOMAIN: DOMAIN.IMAGE: DOMAIN.NAS: DOMNODE: DSMTRACELISTEN: NO EDITOR: YES ENABLEARCHIVERETENTIONPROTECTION: NO ENABLELANFREE: NO ENABLESERVERFREE: NO ENABLECLIENTENCRYPTKEY: NO **ENCRYPTIONTYPE: DES56 ENCRYPTKEY: SAVE** ERRORLOGMAX: 0

ERRORLOGNAME: c:\program files\tivoli\tsm\baclient\dsmerror.log ERRORLOGRETENTION: 7, D ERRORPROG: EVENTLOGGING: NO FASTQUERYBACKUP: NO FOLLOWSYMBOLIC: NO FRSPRIMARYRESTORE: NO GROUPS: GUITREEVIEWAFTERBACKUP: NO HTTPPORT: 1581 IMAGEGAPSIZE: 32 **INCRTHRESHOLD: 0** JOURNALPIPE: \\.\pipe\jnlServer **KERNELMESSAGES: YES** LANGUAGE: dscenu.txt LANFREECOMMMETHOD: Named Pipe LANFREESHMPORT: 1 LANFREETCPPORT: 1500 LANFREETCPSERVERADDRESS: 127.0.0.1 LARGECOMMBUFFERS: NO LOCALBACKUPSET: NO MAILPROG: MAKESPARSEFILE: YES MANAGEDSERVICES: WEBCLIENT MAXCANDPROCS: 5 MAXCMDRETRIES: 2 MAXMIGRATORS: 1 MAXRECALLDAEMONS: 20 MAXRECONCILEPROC: 3 MAXTHRESHOLDPROC: 3 MEMORYEFFICIENTBACKUP: NO MIGFILEEXPIRATION: 7 **MIGRATESERVER:** MINMIGFILESIZE: 0 MINRECALLDAEMONS: 3 NAMEDPIPENAME: \\.\pipe\Server1 NASNODENAME: NFSTIMEOUT: 0 NODENAME: KAILOU NUMBERFORMAT: 1 NWEXITNLMPROMPT: 0 NWIGNORECOMPRESSBIT: NO NWIPCPORT: 0 NWPWFILE: YES OPTFILE: **OPTIONFORMAT: 0** OVERLAPRECALL: NO **PASSWORDACCESS: GENERATE** PASSWORDDIR:

```
POSTNSCHEDULECMD:
       POSTSCHEDULECMD:
       POSTSNAPSHOTCMD:
       PRENSCHEDULECMD:
        PRESCHEDULECMD:
PRESERVELASTACCESSDATE: NO
        PRESNAPSHOTCMD:
 PROCESSORUTILIZATION: 0
      QUERYSCHEDPERIOD: 12
         QUIET/VERBOSE: VERBOSE
     RECONCILEINTERVAL: 24
               REPLACE: YES
 RESETARCHIVEATTRIBUTE: NO
   RESOURCEUTILIZATION: 0
       RESTOREMIGSTATE: YES
           RETRYPERIOD: 20
          RUNASSERVICE: NO
      SCHEDCMDDISABLED: NO
           SCHEDLOGMAX: 0
          SCHEDLOGNAME: c:\program files\tivoli\tsm\baclient\dsmsched.log
     SCHEDLOGRETENTION: 7, D
             SCHEDMODE: POLLING
           SCROLLLINES: 20
          SCROLLPROMPT: NO
            SERVERNAME: DSMSERV
     SESSIONINITIATION: 1
               SHMPORT: 1
          SHMQUEUENAME: \QUEUES\ADSM\DSMSERV
     SKIPNTPERMISSIONS: NO
     SKIPNTSECURITYCRC: NO
 SNAPSHOTCACHELOCATION:
     SNAPSHOTCACHESIZE: 1
 SNAPSHOTFSIDLERETRIES: 10
    SNAPSHOTFSIDLEWAIT: 55,500MS; MINSET: 1
                SUBDIR: YES
         SUBFILEBACKUP: NO
      SUBFILECACHEPATH:
      SUBFILECACHESIZE: 10
            TAPEPROMPT: NO
          TCPADMINPORT: 1500
           TCPBUFFSIZE: 32768
      TCPCLIENTADDRESS:
         TCPCLIENTPORT: 1501
            TCPNODELAY: YES
               TCPPORT: 1500
          TCPRECVDELAY: 0
          TCPSENDDELAY: 0
      TCPSERVERADDRESS: POLONIUM.ALMADEN.IBM.COM
         TCPWINDOWSIZE: 64512
```

```
TESTFLAGS: Not yet implemented
               TIMEFORMAT: 1
                TRACEFILE:
               TRACEFLAGS:
                 TRACEMAX: 0
             TRACESEGSIZE: 0
             TXNBYTELIMIT: 26214400
             USEDIRECTORY: NO
                    USERS:
              USEUNCNAMES: NO
        VIRTUALMOUNTPOINT:
          VIRTUALNODENAME: KAILOU
               WASEXPHOME:
                  WASHOME:
                WASNDHOME:
               WASOFFLINE: NO
tsm>
```

#### 18.2.6 NDMP file-level restore

NDMP support is enhanced to allow you to restore individual files from your Network Attached Storage (NAS) file system image backups. Use the *toc* option with the *include.fs.nas* option in your client options file (dsm.opt) to specify whether Tivoli Storage Manager saves Table of Contents (TOC) information during a NAS file system image backup. If you save TOC information, you can use the Web client or the Tivoli Storage Manager server **restore node** command to restore individual files or directory trees from the NAS file system image that you specify.

**Note:** NDMP support is available only on IBM Tivoli Storage Manager Extended Edition.

#### 18.2.7 Processing EMC Celerra NAS file system images

Through support of NDMP, Tivoli Storage Manager Windows, AIX, and Solaris servers can efficiently back up and restore Network Attached Storage (NAS) file system images to tape drives or libraries that are locally attached to Network Appliance and EMC Celerra NAS file servers.

**Note:** NDMP support is available only on IBM Tivoli Storage Manager Extended Edition.

#### 18.2.8 Backup and restore of the WebSphere Application Server

If you installed the Data Protection for WebSphere Application Server, you can use Tivoli Storage Manager to back up the Version 5.0 WebSphere Application Server Network Deployment Manager (containing setup, application files, and configuration information) or the Application Server. You can restore this information from the Tivoli Storage Manager server and use it to recover a corrupted node application or an entire node (or nodes) in the event of an accident or disaster.

#### 18.2.9 Enhancements for command line image restore operations

You can use the *verifyimage* option with the **restore image** command to specify that you want to enable detection of bad sectors on the destination target volume. If bad sectors are detected on the target volume, Tivoli Storage Manager issues a warning message on the console and in the error log.

If bad sectors are present on the target volume, you can use the *imagetofile* option with the **restore image** command to specify that you want to restore the source image to a file. Then you can use the **dd** utility (available on UNIX and provided in the \baclient directory of the Windows client) to copy data from this file to a logical volume. Use of the **dd** command is shown in Example 18-7.

#### Example 18-7 "dd" command provided with the Windows client

C:\Program Files\Tivoli\TSM\baclient>dd --help

Usage: dd [if=FILE] [of=FILE] [bs=BYTES] [ibs=BYTES] [obs=BYTES] [skip=BLOCKS] [seek=BLOCKS] [count=BLOCKS]

Copy a file/device.

bs=BYTES	force ibs=BYTES and obs=BYTES
count=BLOCKS	copy only BLOCKS input blocks
ibs=BYTES	read BYTES bytes at a time
if=FILE	read from FILE instead of stdin
obs=BYTES	write BYTES bytes at a time
of=FILE	write to FILE instead of stdout
seek=BLOCKS	skip BLOCKS obs-sized blocks at start of output
skip=BLOCKS	skip BLOCKS ibs-sized blocks at start of input
help	display this help and exit
version	display version information and exit

BLOCKS and BYTES may be followed by the following multiplicative suffixes: b - 512, k - 1024, m - 1,048,576, g - 1,073,741,824.

Examples:

```
dd if=e:\x.img of=\\.\x: bs=1m
copies the file e:\x.img to the volume X: using 1MB buffer
dd if=\\.\z: of=z.img
copies the volume Z: to the file z.img using the default buffer (512 bytes)
```

More information on the dd options can be obtained from the Internet by searching for "man dd".

#### 18.2.10 Gathering Tivoli Storage Manager system information

Use the **query systeminfo** command to gather information on one or more of the following items and output this information to a file name that you specify:

- DSMOPTFILE The contents of dsm.opt file
- ENV Environment variables
- ERRORLOG The Tivoli Storage Manager error log file
- FILE Attributes for the file name that you specify
- INCLEXCL Compiles a list of include-exclude in the order in which they are processed during backup and archive operations
- ► OPTIONS Compiled options
- OSINFO Name and version of the client operating system (includes ULIMIT information for UNIX and Linux)
- POLICY Policy set dump
- ► DSMSYSFILE The contents of the dsm.sys file
- CLUSTER AIX/Windows cluster information
- MSINFO Windows system information (output from MSINFO32.EXE)
- REGISTRY Windows Tivoli Storage Manager-related registry entries
- SYSTEMOBJECT Windows system object information

**Note:** More items for use with the **query systeminfo** have been added in later releases. For a complete list, please refer to the latest *Backup-Archive Clients Installation and User's Guide*.

#### 18.2.11 Enhancements for the query filespace command

The **query filespace** command is enhanced to allow you to query a single file space on the Tivoli Storage Manager server.

Querying a *single* filespace was previously not possible. The output of this command is shown in Figure 18-8

Example 18-8 Display a single file space

tsm>	Query Files	pace					
#	Last Incr Date		Туре	File Space Name			
						-	
1	11/25/04	12:41:27	JFS	/			
2	11/25/04	12:41:17	JFS	/var			
tsm>	q fi /var -	detail					
#	Last Inc	r Date	Туре	fsID	Unicode	File Space Name	
1	11/25/04	12:41:17	JFS	1	No	/var	
tsm>							

#### 18.2.12 Separately installable language packs available

Language packs are separately installable packages that contain only language-specific files (such as message catalog, resource file, help files, etc.). You can now install these additional language packs on top of your Tivoli Storage Manager client base install. To change your language preferences, specify the *language* option in your client options file (dsm.opt) or use the Preferences editor.

#### 18.3 Changes in Version 5.2.2

The following common changes for IBM Tivoli Storage Manager Version 5.2.2 Clients have been introduced.

#### 18.3.1 Removal of operand limits for backup and archive operations

The *removeoperandlimit* option specifies that Tivoli Storage Manager removes the 20-operand limit for UNIX-family and Macintosh OS X platforms. If you specify the *removeoperandlimit* option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits.

The *removeoperandlimit* option can be useful if you generate scripts which may invoke the command line client with a large number of operands. For example, you may prescan a directory tree looking for files to back up. As each eligible file is discovered, it is added to the operand list of a selective command. Later, this selective command is submitted by a controlling script. In this case, specifying the *removeoperandlimit* option removes the 20-operand limit for UNIX-family and Macintosh OS X platforms.

**Note:** The *removeoperandlimit* is not available for Windows and Netware.

#### 18.3.2 Multi-session backup session enhancements

Use the *collocatebyfilespec* option to specify whether the Tivoli Storage Manager client uses only one server session to send objects generated from one file specification.

Setting the *collocatebyfilespec* option to *yes* eliminates interspersing of files from different file specifications, by limiting the client to one server session per file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape (unless another tape is required for more capacity).

**Attention:** Use the *collocatebyfilespec* option only if the storage pool is going directly to tape. If you use this option going to a disk storage pool, you could affect some load balancing, and therefore, performance.

#### 18.3.3 WebSphere Application Server (WAS) security support

If WebSphere Application Server security is enabled, user name and password validation for Data Protection for WebSphere Application Server is required. If you do not set the WebSphere Application Server password for security, the backup will failover to an offline backup. It is recommended to set this password to perform consistent backups. Use the **set waspassword** command to set the user name and password for each installation of WebSphere Application Server on your machine. You only need to perform this task once, unless you change your WebSphere Application Server user name or password. You can only perform this task on the Tivoli Storage Manager command line.

#### 18.3.4 Language support enhanced

Tivoli Storage Manager client language packs are available in Russian, Hungarian, Polish, and Czech language locales.

#### 18.4 Changes in Version 5.3

The following common changes for IBM Tivoli Storage Manager Version 5.3 Clients have been introduced.

#### 18.4.1 Include-exclude enhancements

A preview function shows the objects to be backed up or archived according to the include-exclude list, prior to sending any data to the server. The Tivoli Storage Manager Client Java GUI directory tree shows detailed information of included and excluded objects.

The Client Configuration Wizard and the directory tree in the Tivoli Storage Manager Client Java GUI allow you to select files and directories to include or exclude. This is shown later in the three screen captures in Figure 18-6 on page 149, Figure 18-7 on page 150, and Figure 18-8 on page 151.

#### **Preview function**

The preview of the objects to be backed up or archived according to the include-exclude list can be started by selecting **Utilities**  $\rightarrow$  **Preview Include-Exclude** from the client interface. This brings up the Preview Include-Exclude dialog box shown in Figure 18-2.

Preview Include-Exclude	<u>?</u> ×
Use this window to produce a list of files and directories that will be backed up o according to the include-exclude list applicable to the client. This list will be store that you specify.	r archived d in a file
Which function do you want to preview?	
Backup	•
What type of option do you want to preview?	
All	N
All	
Included Excluded	
🖻 🖉 📼 \\klohl2m\c\$ (C:)	
term I cmdcons term I Cm Documents and Settings	
🗄 – 🗹 🛅 Fonts	
🗄 🔽 🧰 lotus	
My Downloads	
My Music	
	<b>–</b>
Enter the name of the file where you want the results to be stored:	
c:\temp\dsmprev.txt	Browse
,	
OK Cancel	Help

Figure 18-2 Web client: Preview Include-Exclude

The output file from the preview function is tab-delimited and can thus easily be opened and viewed with a spreadsheet program as shown in Figure 18-3.

	A	В	С	D	E	F	G	
1	Preview generated on 12/01/2004	11:05:36.						
2	Name:	Size:	Туре:	Status:	Pattern:	Source:	Mgmt Class:	•
6002	C:Notus\123\ssdn04en.123	6.92 KB	0.123	Excluded	C:Votus\123\ssdn04en.123	dsm.opt	DEFAULT	
6003	C:Notus\123\ssdn05en.123	8.69 KB	0.123	Excluded	C:Notus/123\ssdn05en.123	dsm.opt	DEFAULT	
6004	C:Notus\123\ssdn06en.123	5.83 KB	0.123	Excluded	C:Notus/123\ssdn06en.123	dsm.opt	DEFAULT	
6005	C:Notus\123\ssdn07en.123	3.20 KB	0.123	Excluded	C:Notus/123\ssdn07en.123	dsm.opt	DEFAULT	
6006	C:Notus\123\ssdn08en.123	3.31 KB	0.123	Excluded	C:Notus/123\ssdn08en.123	dsm.opt	DEFAULT	
6007	C:Notus\123\ssdn09en.123	4.43 KB	0.123	Excluded	C:Notus/123\ssdn09en.123	dsm.opt	DEFAULT	
6008	C:Notus\123\ssdn10en.123	5.08 KB	0.123	Excluded	C:Notus/123\ssdn10en.123	dsm.opt	DEFAULT	
6009	C:Notus\123\ssdn11en.123	6.13 KB	0.123	Excluded	C:Notus/123\ssdn11en.123	dsm.opt	DEFAULT	
6010	C:Notus\123\ssdn12en.123	5.98 KB	0.123	Excluded	C:Notus/123\ssdn12en.123	dsm.opt	DEFAULT	
6011	C:Notus\123\ssdn13en.123	4.94 KB	0.123	Excluded	C:Notus/123\ssdn13en.123	dsm.opt	DEFAULT	
6012	C:Notus\123\ssdn14en.123	11.64 KB	0.123	Excluded	C:Notus/123\ssdn14en.123	dsm.opt	DEFAULT	
6013	C:Notus\123\ssdn15en.123	11.73 KB	0.123	Included	C:\\*.123	dsm.opt	DEFAULT	
6014	C:Notus\123\ssdn16en.123	8.46 KB	0.123	Included	C:\\*.123	dsm.opt	DEFAULT	
6015	C:Notus\123\ssdn17en.123	10.24 KB	0.123	Included	C:\\*.123	dsm.opt	DEFAULT	
6016	C:Notus\123\ssdn18en.123	13.67 KB	0.123	Included	C:\\*.123	dsm.opt	DEFAULT	
6017	C:Notus\123\ssfn70en.cnt	16.58 KB	.cnt	Excluded	*//*	dsm.opt	DEFAULT	
6018	C:Notus\123\ssfn70en.hlp	388.18 KB	.hlp	Excluded	*[]*	dsm.opt	DEFAULT	
6019	C: Votus \123\ssmn70en.cnt	14.67 KB	.cnt	Excluded	*//*	dsm.opt	DEFAULT	
6020	C:Notus\123\ssmn70en.hlp	274.47 KB	.hlp	Excluded	*//*	dsm.opt	DEFAULT	
6021	C:Notus\123\sssn70en.cnt	3.34 KB	.cnt	Excluded	*[]*	dsm.opt	DEFAULT	
6022	C: Votus \123\sssn70en.hlp	1.41 MB	.hlp	Excluded	*[]*	dsm.opt	DEFAULT	
6023	C:NotusV123%tablelib.t32	48.08 KB	.t32	Excluded	*//*	dsm.opt	DEFAULT	
6024	C:Notus/123%tcui10en.dll	50.50 KB	.dll	Excluded	*11*	dsm.opt	DEFAULT	-
H 4	▶ ▶ dsmprev							

Figure 18-3 Preview Include-Exclude file in a spreadsheet application

#### Detailed information of included and excluded objects

The Tivoli Storage Manager Client GUI directory tree shows detailed information of included and excluded objects, by selecting **View**  $\rightarrow$  **File details...** from the Web or Java client interface. This brings up the Information Window shown in Figure 18-4.

_	Information Window
Name:	00000011.bfs
Kind:	File
Size:	73.25 MB
Stored Size:	-
Where:	/home/tsmdata/file
Created:	-
Modified:	Nov 25, 2004 12:45:49 PM
Accessed:	Nov 25, 2004 1:49:23 PM
User ID:	root
Group ID:	system
Changed:	Nov 25, 2004 12:45:49 PM
Barkup Date:	-
Management Class:	MC_FS_LANFREE
Status:	Excluded
Source:	/usr/tivoli/tsm/client/ba/bin/dsm.svs
Pattern:	INCLUDE "/ /*"
rattern.	INCLODE ()
ок	Cancel Apply Help

Figure 18-4 Client Web/Java GUI: Details of included and excluded objects

More options are available for include/exclude by clicking **Advanced**, as can be seen in Figure 18-5.

Create New Exclude Files Rule	
Which files to exclude from backup?	
Iust this file     00000011 bfs	
All files of this extension:      * bfs	
All files matching pattern	
Enter wildcorded pattern:	
In which directories?	
Just this directory: /tsmdata/file	
O Selected directory. /tsmdata/file Browse	
O All directories	
Exclude in subdirectories too	
In which filesystems?	1
Selected filespaces	
/ home	
/opt	
/tmp	
/usr	
All filesnares	
Preview the include-exclude statement	
OK Concol Holp	
OK Cancel Heip	

Figure 18-5 Client Web/Java GUI: Advanced options, include/exclude of objects

#### Selection of files and directories to include/exclude in the Wizard

The Client Configuration Wizard allows you to select files and directories to include or exclude, as shown in the following screen captures (Figure 18-6, Figure 18-7 and Figure 18-8).
TSM Client Configuration Wizard	×
Recommended Include/Exclude List	<b>D</b>
The following is a list of TSM recommended Include/Exclude items for files which are not norm required for system recovery. Selected items will be added to your configuration file, and exclude backups.	ally ded from
EXCLUDE.BACKUP "*:\microsoft uam volume\\*" EXCLUDE.BACKUP "*:\microsoft uam volume\\*" EXCLUDE.BACKUP "*:\KA DATA. SF" EXCLUDE.BACKUP "*:\IBMBID.COM" EXCLUDE.BACKUP "*:\IBMDOS.COM" EXCLUDE.BACKUP "*:\System32\config\\*" EXCLUDE.BACKUP "*:\System32\config\\*" EXCLUDE.BACKUP "*:\System32\config\\*" INCLUDE.BACKUP "*:\System32\chop\\*"	
Select All Clear	All
< Back Cancel	Help

Figure 18-6 Client Configuration Wizard: Recommended Include/Exclude List

5M Client Configu	iration Wizard							
Common File Exclusion Selection								
Please select from included.	n the list the file types you wish to be excluded. By default, all of these file types are							
Extension	Description							
.a .aif .aiff .arj .asf .asr	.a file AIFF Format Sound AIFF Format Sound .arj file Windows Media Audio/Video file Windows Media Audio/Video shortcut							
	Select All Clear All							
	< Back Next> Cancel Help							

Figure 18-7 Client Configuration Wizard: Common File Exclusion Selection

TSM Client Configuration Wizard
Domain for Backup
Backup Type Incremental
Back up all local file systems
Domain List
C: (Wklchl2m\c\$) D: (\\wick.almaden.ibm.com\tretau) F: (\\wick\scratchn) SYSTEMOBJECT
< <u>B</u> ack <u>N</u> ext > Cancel Help

Figure 18-8 Client Configuration Wizard: Selection of Domain for Backup

#### Selection of files and directories to include/exclude from the GUI

The Tivoli Storage Manager Client Java GUI allows you to select files and directories to include or exclude by selecting **Edit**  $\rightarrow$  **Include Item(s)** or **Edit**  $\rightarrow$  **Exclude Item(s)** from the Web and Java client interface. This brings up the resultant Backup window shown in Figure 18-9.



Figure 18-9 Client Web/Java GUI: Include/Exclude files or directories

#### 18.4.2 Enhancements to query schedule command

To more accurately determine the status of scheduled events, the **query schedule** command on a Tivoli Storage Manager Version 5.3 and above client reports new fields relating to the enhanced scheduling now possible as shown in Example 18-9.

```
tsm> query schedule
    Schedule Name: FIRSTANTHIRDTUESDAY
     Description: First and third Tuesday of every month
   Schedule Style: Enhanced
           Action: Incremental
          Options:
          Objects:
         Priority: 5
   Next Execution: 118 Hours and 48 Minutes
         Duration: 1 Hour
           Period:
     Day of Week: Tuesday
           Month: Any
    Day of Month: Any
    Week of Month: First, Third
           Expire: Never
```

#### 18.4.3 Tivoli Storage Manager Administration Center

Despite the manual stating that the hyperlink from the new Java based IBM Tivoli Storage Manager Administration Center to an IBM Tivoli Storage Manager client machine provides the administrator ID and encrypted password to the Web client through a Java portlet, it currently does not. This should enable the launching of the Web client GUI without the administrator signing on again. The IBM Tivoli Storage Manager Version 5.3 or higher Web client is required for this support.

Security issues may be resolved in future releases but, as of the current 5.3 release, a password is still required.

#### 18.4.4 Deleting individual backups from a server file space

If your administrator has given you authority, you can delete individual backup copies from the Tivoli Storage Manager server without deleting the entire file space. This may be useful in situations where you need to delete:

- Sensitive files that were mistakenly backed up
- A subset of backup files that were inadvertently backed up
- Files that are found to contain viruses

#### Delete Backup from the client command line

Example 18-10 shows how a backup can be deleted using the client command line.

Example 18-10 DELETE BACKUP using the client command line

#delete backup -subdir=yes -pick {\\polonium1\c\$}\

TSM Scrollable PICK Window - Backup Delete

	#	Backup Date	e/Time	File Si	ize	A/I	File	
	1.	11/22/2004	17:36:52	100	B	Α	\\polonium1\c\$\Sdwork\apiver	
	2.	11/22/2004	17:36:52	1.53	KB	А	<pre>\\polonium1\c\$\Sdwork\bluepa</pre>	
	3.	11/22/2004	17:36:52	107	В	А	<pre>\\polonium1\c\$\Sdwork\c4ebcu</pre>	
	4.	11/22/2004	17:36:52	247	В	А	<pre>\\polonium1\c\$\Sdwork\cbpdon</pre>	
Х	5.	11/22/2004	17:36:52	147	В	А	<pre>\\polonium1\c\$\Sdwork\imgpla</pre>	
	6.	11/22/2004	17:36:52	94.41	KB	А	<pre>\\polonium1\c\$\Sdwork\issimo</pre>	
	7.	11/22/2004	17:36:52	43	В	А	<pre>\\polonium1\c\$\Sdwork\monset</pre>	
	8.	11/22/2004	17:36:52	1.88	KB	А	<pre>\\polonium1\c\$\Sdwork\MRF.IN</pre>	
	9.	11/22/2004	17:36:52	1.34	KB	A	<pre>\\polonium1\c\$\Sdwork\mtm.in</pre>	
х	10.	11/22/2004	17:36:52	3.25	KB	А	<pre>\\polonium1\c\$\Sdwork\remove</pre>	
	11.	11/22/2004	17:36:52	1.22	KB	А	<pre>\\polonium1\c\$\Sdwork\web.in</pre>	
	12.	11/22/2004	17:36:52	109	В	А	<pre>\\polonium1\c\$\Sdwork\binw32</pre>	
	13.	11/22/2004	17:36:52	109	В	А	<pre>\\polonium1\c\$\Sdwork\binwin</pre>	
	14.	11/22/2004	17:36:52	109	В	А	<pre>\\polonium1\c\$\Sdwork\binwin</pre>	
	   0	)10-	20	30-			40	
<u>:</u>	=Up <	D>=Down <t></t>	>=Top <b>=Bo</b>	ottom <f< td=""><td><b>{#&gt;=</b></td><td>Righ</td><td>t <l#>=Left</l#></td></f<>	<b>{#&gt;=</b>	Righ	t <l#>=Left</l#>	
<g#></g#>	>=Goto	) Line # <#>	-Toggle Entr	ry <+>=9	Sele	ct A	<pre>ll &lt;-&gt;=Deselect All</pre>	
<#:;	#+>=Se	elect A Range	e <#:#->=Dese	elect A F	Rang	e <	0>=0k <c>=Cancel</c>	
pic	k>							
Bacl	kup †1	les will be	deleted. De	o you wis	sh t	o pro	oceed? (Yes (Y)/No (N)) y	
Baci	kup de	lete->	14/	\\poloniu	/ 1mL	C\$/20	dwork\imgplat.ini [Sent]	
Baci	kup De	elete->	3,329	\\poloniu	1m1/	C\$/20	dwork\removenis.ini [Sent]	
Total number of objects deleted: 2								
Total number of objects failed: 0								
Total number of bytes transferred: 0 B								
Data	a tran	sfer time:		0.	.00	sec		
Net	work d	lata transfer	rate:	0.	.00	KB/s	ec	
Aggi	regate	data transf	fer rate:	0.	.00	KB/s	ec	
0bje	ects c	compressed by	/:		0%	i		
Elap	osed p	rocessing ti	me:	00:01:	:35			

You have the choice to delete active and inactive versions of files and images. A variety of options also support this task, so you can use *filelist*, specify *fromdate* and *fromtime*. With the *pick* option, you can select the files you wish to delete.

#### Delete Backup from the client GUI

Figure 18-10 shows how a backup can be deleted using the client GUI.

-	Ba	ackup Delete		· [
<u>File Edit View H</u> elp				
圓 🛷 温 ☷				8
Delete Delete Active Objects	-			
Delete Active Objects		Name	Size	Modified
Delete All Objects		appletviewer	44.84 KB	-
		appletviewer_g	92.89 KB	-
		extrinerk a	97 89 KB	
📭 🗖 🖬 dt 👘	<b>I</b>	idli	44.85 KB	_
📭 🛄 💼 etc 👘 👘	Image: A mage: A ma	idlj_g	92.9 KB	-
🔰 🛑 🔲 📄 HTTPServer	Image: A state of the state	jar	44.83 KB	-
I IBM		jar_g	92.86 KB	-
include		jarsigner	44.85 KB	- 1
		jarsigner_g	92.88 KB	-
	<b>N</b>	java	25 B	-
		javac	44.89 KB	-
		javac_g	92.89 KB	-
	🗹 🗒	javadoc	44.84 KB	-
		javadoc_g	92.87 KB	-
Java14_64		javah	44.84 KB	-
		javah_g	92.87 KB	-
				•
Displaying /usr/java131/bin				

Figure 18-10 Client Web/Java GUI: Delete Backup Data from the Utilities menu

#### 18.4.5 Optimized option default values

These are the new option default values and some recommendations:

diskbuffsize	Allows you to specify I/O buffer size (in kilobytes) that the client may use to optimize backup, archive, or HSM client performance. <b>Recommendation:</b> Use the default value instead of specifying the <i>diskbuffsize</i> option.
largecommbuffers	This option has been replaced by the <i>diskbuffsize</i> option. At this time, <i>largecommbuffers</i> will continue to be accepted by the Tivoli Storage Manager client in order to ease the transition to the new option. However, the value specified by <i>largecommbuffers</i> will be ignored in favor of the <i>diskbuffsize</i> setting. <b>Recommendation:</b> Discontinue the use of <i>largecommbuffers</i> because future releases of Tivoli Storage Manager might not accept this option.

tcpadminport	Specifies a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network. If this option is not specified, the default value is the value of the <i>tcpport</i> option. Note: This option does not apply for Netware clients.
tcpbuffsize	The default value was changed from 31 kilobytes to 32 kilobytes.
tcpnodelay	The default value was changed from <i>no</i> to <i>yes. tcpnodelay</i> <i>yes</i> disables the TCP/IP Nagle algorithm. This algorithm is used to reduce the number of small segments sent across the network, but in some environments this might negatively impact Tivoli Storage Manager performance. <b>Recommendation:</b> Use the default of <i>yes</i> , unless you fully understand the effects of the TCP Nagle algorithm on network transmissions and how its use affects the performance of Tivoli Storage Manager in your environment.
tcpwindowsize	The default value was changed from 32 kilobytes to 63 kilobytes.

#### 18.4.6 Weblinks: Links from the backup-archive client Java GUI

From the backup-archive client GUI and Web client, you can now directly access the IBM Tivoli Storage Manager Web site, the IBM Tivoli Web site, the IBM Tivoli Storage Manager Support Web site, and the Tivoli Storage Manager Publications Web site.

From the backup-archive command line interface help menu window, the Web site address is displayed. You can enter the Web site address in a browser to access the IBM Tivoli Storage Manager Support Web site for technical support on Tivoli Storage.

#### 18.4.7 New options: Errorlogmax and Schedlogmax, and DSM\_LOG

The environment variable DSM\_LOG is only available to UNIX and Windows clients, thus the information concerning DSM\_LOG does not apply to Netware clients.

#### New options Errorlogmax and Schedlogmax

*Errorlogmax* and *Schedlogmax* are new options for controlling log size.

**Errorlogmax** specifies the maximum size for the error log, in megabytes.

Schedlogmax specifies the maximum size for the scheduler log, in megabytes.

#### DSM\_LOG environment variable changes

DSM\_LOG environment variable changes have been made to prevent a security or data integrity problem. Logs will no longer be created in the installation directory. In addition, if the client is unable to open a required log for writing, the client process will terminate. The Tivoli Storage Manager command line client, the Web client acceptor and agent will not run without a writable dsmerror.log.

**Note:** The environment variable DSM\_LOG does not apply to the Netware clients.

#### 18.4.8 Enhanced encryption

Tivoli Storage Manager now supports AES (Advanced Encryption Standard) 128-bit data encryption to encrypt data during backup and archive operations using the *include.encryption* option.

**Caution:** You can encrypt the data that is sent to the server during a backup or archive operation using standard encryption. If you use the encryption feature to encrypt your data during backup or archive, you must have the encryption key, in order to restore or retrieve the data. If the encryption key is not available on the client machine (via the *encryptkey* option) and you forgot the encryption key, then the data *cannot* be restored or retrieved under any circumstances.

#### 18.4.9 Dynamic client tracing

A new command line utility, **dsmtrace**, is available to enable tracing, disable tracing, or change trace flags while the client is running. See the *Problem Determination Guide* for information about using this utility.

**Note:** Tracing is an advanced diagnostic feature intended for use only at the recommendation of IBM support and development, or as outlined in the *Problem Determination Guide*.

#### 18.4.10 Web client enhancements (plus: Java GUI in UNIX)

This section describes the Web client enhancements.

#### Web client enhancements

You can now perform the following functions from the Web client:

- Find files in the backup, restore, archive or retrieve window
- Back up, restore, archive, or retrieve your files by filtering file names or filtering the directory tree
- Restore your data from backup sets without a server connection

*Finding files in the backup, restore, archive, or retrieve window* Figure 18-11 shows how to find files in these various windows.

🅵 Backup File Edit View Help				
II 《 <mark>S Find Files (Backup)</mark> File Edit View Actions Help ■ ■ ■ 目 温 語				× १
Search Files	 Se	arch Results		
Start Pain Mklchl2mic\$ File Name matches mask a*		Name AUTOEXEC.BAT arcsetup.exe arcldr.exe AMS2INST.LOG Active Setup Log.bt	Norizmos Directory Nkichi2mic\$ Nkichi2mic\$ Nkichi2mic\$ Nkichi2mic\$WVINNT Nkichi2mic\$WVINNT	Size 0 B 160 147 1.23 11.1
File: AU1     Date       Java App     Size       Search     Filter		acp_mtm_all,xml acp_mtm_all,xml acpCom_mon.dll awav.dll avtapi.dll	Nkichi2mic\$WiNNT\Te Nkichi2mic\$WiNNT\Te Nkichi2mic\$WiNNT\sy Nkichi2mic\$WiNNT\sy	296 100 74.2. 221
Search stop by user	<u>r</u>		Files inspecte	ed: 2850
Java Applet Window				

Figure 18-11 Finding files in the backup, restore, archive or retrieve window

Back up, restore, archive, or retrieve your files by filtering file names or filtering the directory tree. This is done in the same window as the search as seen in Figure 18-11, but clicking **Filter** instead of **Search**.

#### Java GUI and Web client enhancements

In addition to the enhancements listed above, there is one enhancement only available in the UNIX environment:

• You can archive the file or directory where the symbolic link points.

## 19

## UNIX specific client enhancements

This chapter provides information on the changes introduced on the UNIX platform, for which a current version of the IBM Tivoli Storage Manager client is available, and which have not been described previously in Chapter 18, "Common client enhancements" on page 129.

The different UNIX derivatives are documented in one manual (*TSM 5.3 UNIX* and *Linux Backup-Archive Clients Installation and User's Guide*, GC32-0789-05).

They include the following versions:

- AIX
- HP-UX
- Linux
- Solaris

**Note:** The IBM Tivoli Storage Manager client Version 5.3 for Solaris will be released at a later point in time.

## 19.1 Changes in client Version 5.1.5

These are the UNIX specific client enhancements for this version.

#### 19.1.1 LAN-free data movement support on linux86 client

Tivoli Storage Manager supports LAN-free data movement in a storage area network (SAN) environment for the Linux86 client. LAN-free data movement allows client data to move directly from the client to a SAN-attached storage device. Shifting the client data movement from the communications network to a SAN decreases the load on the server. This allows the server to support a greater number of simultaneous client connections.

#### 19.1.2 Linux86 client support for the GPFS

Tivoli Storage Manager supports backup and restore of the General Parallel File System (GPFS) on the Linux86 client.

#### 19.1.3 Storage Agent now available for Linux

The Storage Agent 5.1 for Linux became available October 2002.

#### 19.1.4 64-bit support for the Storage Manager HP-UX client

The Tivoli Storage Manager 32-bit HP-UX client can perform backup, restore, archive, and retrieve functions to a Tivoli Storage Manager 64-bit server with the Shared Memory communication method.

## **19.2 Changes in client Version 5.2**

These are the UNIX specific client enhancements for this version.

#### 19.2.1 Veritas file systems, ACLs, and Veritas Volume Manager

Tivoli Storage Manager supports backup, restore, archive, and retrieve of Veritas file systems (VxFS) including ACLs on the AIX (32-bit and 64-bit) clients. Image backup and restore of Veritas Volume Manager logical volumes is also supported.

#### 19.2.2 Automounter support for Linux86 and Linux390 clients

The Tivoli Storage Manager Linux86 and Linux390 clients now support the backup of automounted NFS and loopback file systems. Use the *automount* option with the *domain* option to specify all automounted file systems the Tivoli Storage Manager client tries to mount at the following points in time:

- When Tivoli Storage Manager client starts
- When the back up is started
- When the Tivoli Storage Manager client has reached an automounted file system during backup

## 19.3 Changes in client Version 5.2.2

These are the UNIX specific client enhancements for this version.

#### 19.3.1 Support for controlling symbolic link processing

Tivoli Storage Manager treats symbolic links as actual files and backs them up. However, the file referenced by the symbolic link is not backed up. In some cases symbolic links can be easily recreated and need not be backed up. In addition, backing up these symbolic links can increase backup processing time and occupy a substantial amount of space on the Tivoli Storage Manager server. You can use the *exclude.attribute.symlink* option to exclude a file or a group of files that are symbolic links from backup processing. If necessary, you can use the *include.attribute.symlink* option to include symbolic links within a broad group of excluded files for backup processing.

#### 19.3.2 Backup and restore for SAN File System for AIX

Backup and restore for IBM TotalStorage SAN File System is supported on the AIX 5.1 client.

#### 19.3.3 Backup-archive client Linux on iSeries

The Tivoli Storage Manager backup-archive client supported features on Linux for iSeries are the same as those supported by the Linux for pSeries client.

#### 19.3.4 Backup-archive client for Linux on Intel Itanium

The Tivoli Storage Manager backup-archive client for Linux on Intel Itanium (Linux IA64 client) supports these file systems and their ACLs: xfs, ext2, and ext3. As with the Linux for X86 client, the Linux IA64 client supports the ReiserFS file system, but not its ACLs.

The Tivoli Storage Manager Linux IA64 client supports the same functions as the Linux86 client, except the following:

- Backup-archive Native Graphical User Interface (Motif GUI)
- LAN-free data transfer
- Cluster support

### 19.4 Changes in client Version 5.3

These are the UNIX specific client enhancements for this version.

**Note:** The IBM Tivoli Storage Manager client Version 5.3 for **Solaris** will be released at a later point in time.

#### 19.4.1 Client node proxy support [option: Asnodename]

Backup time can be reduced and clustered configurations can store data with client node proxy support. Tivoli Storage Manager nodes, when authorized (*grant proxynode*, see 3.4.15, "Multiple Tivoli Storage Manager client nodes" on page 60) as agent nodes, can be directed to back up or restore data on behalf of another node (the target node). This enables concurrent operations from multiple nodes to store data to the same target node and file space in parallel.

The concurrent operations can reduce backup and restore times in environments such as IBM GPFS. Client nodes can also be configured with proxy node authority to support many of the systems that can be configured to support clustering failover. The *asnodename* option also allows data to be restored from a different system than the one which performed the backup.

More details on this can be found in Appendix, "Comparison of options virtualnodename/fromnode/asnodename" on page 320.

#### 19.4.2 Backup-archive client for HP-UX Itanium 2

The Tivoli Storage Manager backup-archive client supported features on HP-UX Itanium 2 are the same as those supported by the existing HP-UX client.

### 19.4.3 Linux for zSeries offline image backup

You can now perform offline image backups on Linux zSeries, including native zSeries® volumes and partitions created by Logical Volume Manager.



## 20

## Windows specific client enhancements

This chapter provides information on the changes which have been introduced in IBM Tivoli Storage Manager client for Windows, and which have not been described previously in Chapter 18, "Common client enhancements" on page 129.

## 20.1 Changes in client Version 5.1.5

These are the Windows specific client enhancements for this version.

#### 20.1.1 Excluding specific system objects from backup processing

You can use the *exclude.systemobject* option in the client options file (dsm.opt) to exclude specific system objects from backup processing.

**Note:** This excludes individual system objects from backup services. Excluded system object types that you backed up previously are not expired during subsequent backups. This option only excludes the system object types that you specify from subsequent backups.

This option is valid for Windows 2000 and Windows XP clients only.

#### 20.1.2 Ignore NTFS compression attribute

During an incremental backup, if the only change to a file is the compression attribute, the client will send the attribute update to the Tivoli Storage Manager server without backing up the entire contents of the file. This enhancement does not apply to files residing on journalled file systems.

#### 20.1.3 Enhanced image backup and restore processing

This enhancement only effects Windows 2000 clients. If bad disk sectors are detected on the source drive during a LAN-free or LAN-based image backup, data corruption may occur. In this case, bad sectors are skipped when sending image data to the Tivoli Storage Manager server. If bad disk sectors are detected during the image backup, a warning message is issued after the image backup completes.

#### 20.1.4 Support for monitoring or cancelling server-free operations

This enhancement effects only Windows 2000 clients. You can use the **monitor process** and **cancel process** commands to monitor or cancel a server-free image backup or restore process.

#### 20.1.5 DBCS installation path on Unicode-enabled clients

You may install the following Tivoli Storage Manager services under a double-byte character set (DBCS) path on Windows NT, 2000, and XP Unicode-enabled clients:

- Backup-Archive Scheduler Service
- Client Acceptor Service (CAD)
- Remote Client Agent Service
- ► Journal Engine Service

### 20.2 Changes in client Version 5.2

These are the Windows specific client enhancements for this version.

#### 20.2.1 Open file support for backup and archive operations

This feature affects only Windows 2000 and Windows XP. If the Logical Volume Snapshot Agent (LVSA) is installed and configured for open file support via the setup wizard, by default, Tivoli Storage Manager performs a *snapshot* backup or archive of files that are open (or locked) by other applications. The snapshot allows the backup or archive to be taken from a point-in-time copy that matches the file system at the time the snapshot is taken. Subsequent changes to the file system are not included in the backup or archive operation. You can use the *include.fs* option to specify whether a drive uses open file support.

#### 20.2.2 Microsoft Volume Shadowcopy Service (VSS)

This feature affects only Windows 2003 Server. Tivoli Storage Manager supports the Microsoft Volume Shadowcopy Service (VSS) on Windows Server 2003. Tivoli Storage Manager uses VSS to back up all Windows Server 2003 system state components as a single object, to provide a consistent point-in-time snapshot of the system state. System services components can be backed up individually.

#### 20.2.3 Microsoft Automated System Recovery (ASR)

This feature affects only Windows Server 2003 and Windows XP. Microsoft Automated System Recovery (ASR) is a restore feature of Windows XP Professional and Windows Server 2003 that provides a framework for saving and recovering the Windows XP or Windows Server 2003 operating state, in the event of a catastrophic system or hardware failure. Tivoli Storage Manager supports the *bare metal* restore by participating in the ASR restore framework. Tivoli Storage Manager creates the files required for ASR recovery and stores them on the Tivoli Storage Manager server. You can restore these files to a diskette for use during ASR recovery.

See the *TSM 5.3 Windows Backup-Archive Client Installation and User's Guide* for further information about backing up Automated System Recovery (ASR) files (Windows XP, Windows Server 2003) and the ASR preparation procedure.

#### 20.2.4 Command line and GUI display actual image size

Because image backup allows you to back up only used blocks in a file system, the stored image size on the Tivoli Storage Manager server could be smaller than the volume size. For online image backups, the stored image can be larger than the file system based on the size of the cache files. The Tivoli Storage Manager command line and GUI now display the actual image size stored on Tivoli Storage Manager server.

## 20.3 Changes in client Version 5.2.2

These are the Windows specific client enhancements for this version.

#### 20.3.1 Support for Veritas Cluster Server cluster environment

You can install the Tivoli Storage Manager backup-archive client and scheduler service on Veritas Cluster Server cluster nodes to back up and restore shared volumes in a Veritas Cluster Server cluster environment.

#### 20.3.2 Backup and restore support for SAN File System

Backup and restore for IBM TotalStorage SAN File System are now supported on the Windows 2000 client.

## 20.4 Changes in client Version 5.3

These are the Windows specific client enhancements for this version.

#### 20.4.1 Journal based backup enhancements

There are several significant improvements to the journal based backup, which come with Version 5.3.

#### **Functional overview**

The following sections present a functional overview of these enhancements.

#### Improved journal database

- A BTREE based journal database has been implemented in this release to replace the previous ISAM based database.
- The new database removes the 2-gigabyte database size limitation and is also more reliable than the previous database.
- Each entry in the new database is approximately 4K so the size of journal databases may be easily estimated for file systems with a known amount of change activity.
- The new database also has the advantage of reclaiming occupied disk space when all entries in the database have been deleted (as is done during a full incremental/journal based backup).

#### Multiple session support

- Multiple concurrent journal based backup sessions are supported in this release.
- Multiple backup sessions are created by a single backup client via the ResourceUtilization option, or by running multiple instances of a backup client.

#### Improved file system monitor

- The journal daemon file system monitor has been rewritten to fix problems described in APAR IC40140 and to better accommodate high levels of file system change activity.
- The new file system monitor should significantly reduce the likelihood of notification buffer overflows generated as a result of high file system activity.
- The new default aggregate size of the notifications buffers for each journal file system is 3 megabytes should be sufficient for most environments.

#### Running multiple journal services on the same machine

Multiple journal services may be installed on the same machine by using the new JournalPipe client option and Journal service configuration setting.

**Note:** Journaling the same file system with multiple journal services may produce unpredictable results; each journal service should be configured to journal different file systems.

#### Improved command line client status messages

The command line client status messages have been improved by providing additional information, as can be seen in Example 20-1 and Example 20-2.

Example 20-1 Improved command line client status messages - example 1

```
D:\tsm530c\debug\bin\winnt unicode>dsmc incr x:
IBM Tivoli Storage Manager
Command Line Backup/Archive Client Interface
  Client Version 5, Release 3, Level 0.0 a14
  Client date/time: 04/28/2004 13:10:35
(c) Copyright by IBM Corporation and other(s) 1990, 2004. All Rights Reserved.
Node Name: GSHLAGER3
Session established with server GSHLAGER2 SERVER1: Windows
  Server Version 5, Release 2, Level 0.0
  Server date/time: 04/28/2004 13:10:33 Last access: 04/28/2004 13:10:16
Incremental backup of volume 'x:'
Querying Journal for '\\gshlager3\x$'
Processing 2 Journal entries for '\\gshlager3\x$'
Normal File--> 5,383 \\gshlager3\x$\testfile1 [Sent]
Normal File--> 5,383 \\gshlager3\x$\testfile2 [Sent]
Successful incremental backup of '\\gshlager3\x$'
Total number of objects inspected:
                                        2
                                        2
Total number of objects backed up:
Total number of objects updated:
                                        0
Total number of objects rebound:
                                        0
                                        0
Total number of objects deleted:
                                        0
Total number of objects expired:
Total number of objects failed:
                                        0
Total number of bytes transferred:
                                     4.21 KB
Data transfer time:
                                     0.00 sec
Network data transfer rate:
                                   0.00 KB/sec
Aggregate data transfer rate: 1.03 KB/sec
Objects compressed by:
                                     63%
                             00:00:04
Elapsed processing time:
```

D:\tsm530c\debug\bin\winnt\_unicode>

Example 20-2 Improved command line client status messages - example 2

```
D:\tsm530c\debug\bin\winnt_unicode>dsmc incr x:\dira
IBM Tivoli Storage Manager
Command Line Backup/Archive Client Interface
   Client Version 5, Release 3, Level 0.0 a14
   Client date/time: 04/28/2004 13:17:23
(c) Copyright by IBM Corporation and other(s) 1990, 2004. All Rights Reserved.
Node Name: GSHLAGER3
Session established with server GSHLAGER2_SERVER1: Windows
   Server Version 5, Release 2, Level 0.0
```

Server date/time: 04/28/2004 13:17:21 Last access: 04/28/2004 13:17:19

Incremental backup of volume 'x:\dira'
Querying Journal for '\\gshlager3\x\$\dira'
Another Journal Based Backup is currently in progress for '\\gshlager3\x\$\dira'
Waiting for other Journal Based Backup to complete
Processing 0 Journal entries for '\\gshlager3\x\$\dira'
Successful incremental backup of '\\gshlager3\x\$\dira'

D:\tsm530c\debug\bin\winnt\_unicode>

#### New options and configuration settings

#### JournalPipe

This setting/option is used in conjunction with backup client option of the same name to specify the pipe name of the journal daemon session manager which backup client initially connect to when establishing a journal based backup session.

Note that the same pipename must be specified for the client *JournalPipe* option.

The primary purpose of this setting is to allow running multiple instances of the journal daemon. Each journal daemon must specify a different pipename.

The default pipename is \\.\pipe\jn1Server

Example in tsmjbbd.ini:

```
[JournalSettings]
JournalPipe= \\.\pipe\jnlServer1
```

Example in dsm.opt:

```
JournalPipe \\.\pipe\jnlServer1
```

#### Useful documentation and utilities

Useful documentation and utilities are available from the IBM Knowledge Base under "TSM Journal Based Backup FAQ", which can be found under the following URL:

http://www.ibm.com/support/docview.wss?rs=203&context=SWI00&context=SWJ00&c
ontext=SWK00&q1=Journal+Based+Backup&uid=swg21155524&loc=en\_US&cs=utf-8&lan
g=en+en

This page can be found by going to the IBM Support page and then searching for "journal based backup":

http://www.ibm.com/support

#### Usage of the resourceutilization option

Because multiple journal based backup sessions are now possible, here is some additional information about usage of the *resourceutilization* option.

Use the *resourceutilization* option in your client options file dsm.opt to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.

#### Regulating backup and archive sessions

When you request a backup or archive, the client can use more than one session to the server. The default is to use a maximum of two sessions; one to query the server and one to send file data. The client can use only one server session if you specify a *resourceutilization* setting of 1.

A client can use more than the default number of sessions when connecting to a server that is Version 3.7 or higher. For example, *resourceutilization*=10 permits up to eight sessions with the server. Multiple sessions may be used for querying the server and sending file data.

**Note:** As of the time of the writing of this book, only Tivoli Storage Manager Versions 5.1.5 or above are supported Tivoli Storage Manager server versions.

Multiple query sessions are used when you specify multiple file specifications with a backup or archive command. For example, if you enter this command:

#### inc filespaceA filespaceB

And if you also specify *resourceutilization*=5, the client may start a second session to query files on file space B. Whether or not the second session starts depends on how long it takes to query the server about files backed up on file space A. The client may also try to read data from the file system and send it to the server on multiple sessions.

#### 20.4.2 Single drive support for OFS or online image backups

You can now perform open file support (OFS) or online image backups on machines with a single NTFS-based C: drive. You can also easily verify if the LVSA is functioning properly or find the root cause of any failure by checking the Windows event log, without turning on any trace facilities.

Note: Windows 2003 LVSA for OFS has delayed availability.



## 21

## Netware specific client enhancements

This chapter provides information on the changes introduced in IBM Tivoli Storage Manager client for Netware, which have not been described previously in Chapter 18, "Common client enhancements" on page 129.

## 21.1 Changes in client Version 5.1.5

These are the Netware specific client enhancements for this version.

#### 21.1.1 Support for Novell Cluster Services

You can install Tivoli Storage Manager locally on each NetWare server in an NCS environment cluster. You can also install and configure the Tivoli Storage Manager backup-archive scheduler for each cluster node to manage all local disks and each cluster group containing physical disk resources.

More information can be found in Appendix C. "Configuring the backup-archive client in a Novell Cluster Services (NCS) environment" of the *TSM 5.3 NetWare Backup-Archive Clients Installation and User's Guide*, GC32-0786-05.

### 21.2 Changes in client Version 5.2

These are the Netware specific client enhancements for this version.

#### 21.2.1 Enhanced ALL-LOCAL domain processing (NDS replica)

If the local NetWare server contains a master NDS replica, then NDS will now be processed as a part of the ALL-LOCAL domain.

### 21.3 Changes in client Version 5.2.2

These are the Netware specific client enhancements for this version.

#### 21.3.1 Support for Novell NetWare 6.5 operating system

Beginning with Tivoli Storage Manager Version 5.2.2, the Novell NetWare 6.5 operating system is supported.

**Information on the software requirements:** Novell NetWare 5.1, 6.0, and 6.5. These Novell NetWare server levels are required for local or remote Tivoli Storage Manager operations. See the readme file that is shipped on the product installation media for information on supported patches from Novell.

## 21.4 Changes in client Version 5.3

There were no changes specific to the IBM Tivoli Storage Manager client for this platform. See Chapter 18, "Common client enhancements" on page 129 of this redbook for further details.

#### No Netware specific changes

No features have been added or modified specifically for this platform.



## 22

# Mac OS X specific client enhancements

This chapter provides information on the changes introduced in IBM Tivoli Storage Manager client for Mac OS X, which have not been described previously in Chapter 18, "Common client enhancements" on page 129.

## 22.1 Changes in client Version 5.1.5

There were no changes specific to the IBM Tivoli Storage Manager client for this platform. See Chapter 18, "Common client enhancements" on page 129 of this redbook for further details.

#### No changes in this version

No features have been added or modified specifically for this platform.

### 22.2 Changes in client Version 5.2

These are the Mac OS specific client enhancements for this version.

#### 22.2.1 Migrating to the Unicode-enabled client

Information on the benefits, how to migrate to the Unicode-client and on the necessary considerations for Unicode-enabled clients is provided in the *IBM Tivoli Storage Manager for Macintosh Backup-Archive Clients Installation and User's Guide Version 5 Release 2*, GC32-0787-04.

Beginning with IBM Tivoli Storage Manager Version 5.2, the Macintosh client is Unicode enabled. The Unicode-enabled client supports Unicode for file, directory, and file space names.

#### 22.2.2 The inclexcl option

The *inclexcl* option to use an include-exclude options file was introduced with this version.

#### 22.2.3 The autofsrename option

With the introduction of support for Unicode, the option *autofsrename* allows preservation of non-Unicode filespaces.

The *autofsrename* option renames an existing file space on a server so that a Unicode-enabled file space with the original name can be created for the current operation.

**Note:** Be aware that a filespace rename will behave like a full backup, incurring a longer backup time and extra storage capacity.

## 22.3 Changes in client Version 5.2.2

These are the Mac OS specific client enhancements for this version.

#### 22.3.1 Enhanced firewall security

Security for back up and restore operations and Tivoli Storage Manager administrative functions is enhanced to allow the Tivoli Storage Manager server to control whether the server or client initiates sessions through a firewall. Use the *sessioninitiation* option to control whether the server or client initiates sessions through a firewall. The default is that the client initiates sessions. You can use this option with the **schedule** command.

Both the server and client can also specify a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network. Use the *tcpadminport* option to specify a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network.

**Note:** This has already been introduced in Version 5.2 for all the other platforms.

#### 22.3.2 Encrypting data during backup or archive operation

Tivoli Storage Manager supports the encryption of data that is sent to the server during a backup or archive operation using standard 56-bit encryption.

**Caution:** You can encrypt the data that is sent to the server during a backup or archive operation using standard 56-bit encryption. If you use the 56-bit encryption feature to encrypt your data during backup or archive, you must have the encryption key in order to restore or retrieve the data. If the encryption key is not available on the client machine (via the *encryptkey* option) and you forgot or lost the encryption key, then the data *cannot* be restored or retrieved under *any* circumstances.

#### 22.3.3 Displaying options and their settings via the command line

This feature was available since IBM Tivoli Storage Manager Version 5.1.5 for all other clients. Use the **query options** command to display all or part of your options and their current settings. This command accepts an argument to specify a subset of options. The default is to display all options.

#### 22.3.4 Gathering Tivoli Storage Manager system information

This feature was available since IBM Tivoli Storage Manager Version 5.1.5 for all other clients. Use the **query systeminfo** command to gather Tivoli Storage Manager system information and output this information to a file or the console.

#### 22.3.5 Tivoli Storage Manager command line interface

Beginning with Tivoli Storage Manager Version 5.2.2, the Macintosh client provides a command line interface. As with the traditional Macintosh client graphical user interface, you can perform all backup, archive, restore, and retrieve tasks locally or remotely through the native client command line interface.

#### 22.3.6 Tivoli Storage Manager as a background scheduler

The Tivoli Storage Manager Macintosh client can now be configured as a startup item to handle scheduled events without requiring a user to be logged in.

#### 22.3.7 Non-administrators can manage their own data

The system administrator is responsible for enabling non-administrators to use Tivoli Storage Manager to manage their own data.

#### 22.3.8 Tivoli Storage Manager administrative client

Beginning with Tivoli Storage Manager Version 5.2.2, the Macintosh client supports an administrative command line interface. The administrative command line interface permits a Tivoli Storage Manager administrator to control and monitor server activities, define storage management policies for backup, archive and space management services, and set up schedules to perform those services at regular intervals.

#### 22.3.9 Controlling symbolic link and alias processing

Tivoli Storage Manager treats symbolic links and aliases as actual files and backs them up. However, the file referenced by the symbolic link is not backed up. In some cases symbolic links and aliases can be easily recreated and need not be backed up. In addition, backing up these symbolic links or aliases can increase backup processing time and occupy a substantial amount of space on the Tivoli Storage Manager server. You can use the *exclude.attribute.symlink* option to exclude a file or a group of files that are symbolic links or aliases from backup processing. If necessary, you can use the *include.attribute.symlink* option to include symbolic links or aliases within a broad group of excluded files for backup processing.

## 22.4 Changes in client Version 5.3

This version of the IBM Tivoli Storage Manager client for Mac OS X is due for release at a later date.


# Part 4

# Important new features in detail

This part of the book describes new features for the Administration Center and Operational Reporting.



# 23

# **Administration Center**

This chapter describes the newly introduced Administration Center in detail.

This interface is all new and replaces the Web interface available up to the previous version.

For frequently asked questions regarding the Administration center, please refer to Appendix E, "Frequently asked questions: Administration Center" on page 371.

For a list of available Administration Center Wizards, please refer to Appendix D, "Administration Center Wizards" on page 363.

Administration Center videos and tutorials: We created two short videos that give an example of how to work with the new Administration Center. We show how to access the command line and how to unlock a client node; please refer to Appendix G-1, "Additional material" on page 394 on how to download the videos. In addition, you can download Macromedia Flash based tutorials that provide an introduction to the new Administration Center.

# 23.1 Introduction

This version of IBM Tivoli Storage Manager uses components from IBM's Autonomic Computing Technology Integration suite. Autonomic computing takes technology another step closer to "self-healing" systems. Autonomic computing is a phrase IBM uses to describe the set of technologies and tools that enable applications, systems, and entire networks to become more self-managing.

Self-management involves four qualities — self-configure, self-heal, self-optimize, and self-protect — which are often referred to as Self-CHOP characteristics. The word autonomic is borrowed from physiology; as a human body knows when it needs to breathe, software is being developed to enable a computer system to know when it needs to repair itself, configure itself, and so on. Further details regarding Autonomic Computing are available here:

http://www.ibm.com/developerworks/autonomic/newto/

**Note:** The Tivoli Storage Manager Server and the Administrations Center can be installed on the same machine. The Administration Center requires at a minimum 512 MB RAM in addition to the RAM required for the Tivoli Storage Manager Server.

For the latest recommendation on the Administration Center installation, use keyword TSMADMINCENTER when you visit:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

#### 23.1.1 What is the Integrated Solutions Console?

IBM Tivoli Storage Manager's new user interface consists of a number of different components which will assist the administrator in managing multiple IBM Tivoli Storage Manager servers within a single, integrated console.

#### 23.1.2 Integrated Solutions Console Infrastructure

The ISC builds on top of the WebSphere Application Server and WebSphere Portal base and includes lightweight versions of both in the ISC runtimes. It looks for common problems, actions, and subtasks across the range of ISC components in order to provide reusable services. Basing the ISC on a lightweight portal infrastructure provides the ability to aggregate independent tasks and information into a single organized presentation.

## 23.1.3 Console components

An instance of an Integrated Solutions Console consists of the ISC framework hosting a set of console components, built by the Storage Group, in the case of IBM Tivoli Storage Manager. The framework can also host console components from other IBM ISC framework aware applications such as DB2.

# 23.2 Integrated Solutions Console installation

The installation of the Tivoli Storage Manager Administration Center depends on the installation of the IBM Integrated Solutions Console. The IBM Integrated Solutions Console must be installed before the Administration Center can be installed.

Here is a detailed example of the ISC installation, beginning with the Java Install shown in Figure 23-1.



First, the InstallShield Wizard will update the Java version installed on your machine. Next, the initial Welcome window is displayed, as shown in Figure 23-2.



Figure 23-2 Initial Welcome window for ISC Install

A more detailed Welcome window is then displayed with a brief overview and version information, as shown in Figure 23-3. Click **Next** to continue.

(elcome			
The Administration Storage Manage component. The provided by one of	on Center is a Web-based i r Version 5.3 servers. The A Integrated Solutions Conso or more IBM applications.	interface that can be used to centrally doministration Center is installed as a ole allows you to create custom soluti	configure and manage IBM Tivoli n IBM integrated Solutions Console ons by installing components
Version 5.1 of the Integrated Solution	e Integrated Solutions Cons ons Console is already inst	sole is required to use the Administrat talled, it will be upgraded to Version 5.	ion Center. If an earlier version of the 1
Note: The Integra a Tivoli Storage M Installation Guidi a large number d	ted Solutions Console (alo flanager server if the systen a for system requirements. If servers or administrators	ong with the Administration Center) ca n meets the combined requirements t If you plan to use the Administration C , consider installing the Administration	n be installed on the same system as for both applications. See the senter to manage an environment with n Center on a separate system.
For the latest pro support website (http://www.ibm.c	duct information, see the re om/software/sysmgmt/prod	eadme file on the installation CD or the ducts/support/IBMTivoliStorageManag	e Tivoli Storage Manager technical er.html).

Figure 23-3 Second Welcome window

The next step is to accept the International Program License Agreement as in Figure 23-4. Click **Next** to continue.

Integrated Solutions Console	_ 🗆 🗵
Tivoli Storage Manager	EW.®
Review License Information. Select whether to accept the license terms for this product. By accepting the terms of t license, you acknowledge that you have thoroughly read and understand the license information.	his
International Program License Agreement	<b></b>
Part 1 - General Terms	
BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE PROGRAM YOU AGREE TO THE TER OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND THAT PERSON, COMPANY, OR LEGAL ENTITY TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TER	MS MS,
- DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, OR USE THE PROGRAM; AND	
- PROMPTLY RETURN THE PROGRAM AND PROOF OF ENTITLEMENT TO THE PARTY FROM WHOM YOU	•
I accept the terms of the license agreement.	
C I do not accept the terms of the license agreement.	
InstallShield	
< Back Next > Ca	ancel

Figure 23-4 International Program License Agreement window

The next window allows the CD installation path to be entered or confirmed, as shown in Figure 23-5. Click **Next** to continue.

🞯 Integrated Solutions Console	
Tivoli Storage Manager	IBM.
Select the Location of the Installation CD	
Location of the installation CD	
Etiscinstall	
	Browse
j InstallShiald	
< Back	Next > Cancel

Figure 23-5 Location of Installation CD

The next step is to point to the installation destination, as shown in Figure 23-6. Then click **Next** to continue.

Integrated Solutions C	Console				<u>_                                    </u>
Tivoli Storage N	Manager				<u>IB</u> ¥®
Select Where to Install have at least 982 MB o they will use approxim must have a minimum click Browse to install t	the IBM Integrated Sc f available space. Afte ately 470 MB of space of 679 MB of free dis to a different directory.	olutions Console. To eryou install the Integ a. To install the Integ k space. Click Next to	perform the installati rated Solutions Cons rated Solutions Cons install "Integrated So	on, the location you se cole and the Administr ole, the system tempo lutions Console" to th	lect must ation Center, orary directory is directory, or
Directory Name:	180				
IC. (Flogram Files (IB) MM					Browse
InstallShield			< Back	Next >	Cancel

Figure 23-6 Install destination

The installation continues with the next step, which is to confirm the *iscadmin* userid and password. The default userid is *iscadmin* but this can be changed if required. Note that the password must be entered twice, as shown in Figure 23-7. Click **Next** to continue.

ntegrate	ed Solutions Console	:				
voli S	Storage Man	ager				IBN.
Create a	User ID and Passwo	ord				
The Adr a user I adminis	ministration Center is ID and password are strator credentials de	s installed as an required to log i fined for Tivoli St	IBM Integrated Solu n to the Integrated S orage Manager sen	tions Console (ISC) co olutions Console. After rers to add them to the	mponent. To provi you log in, you car Administration Ce	de security, n use the nter.
* Integr	rated Solutions Cons	ole user ID				
* Integr	nin rated Solutions Cons	ole user passwo	urd .			
	*			1		
* Verifv	password					
*****	*					
stallShiel	id					

Figure 23-7 Create ISC administrator userid and password

The next window, Figure 23-8, shows the ports used for the ISC. Again, these are the defaults, but you can change them if you need to. Click **Next** to continue.

ntegrated Solutions Co	nsole				
oli Storage M	anager				TBM.
Select the Ports the IBM I	ntegrated Solutions	Console Can Use			
As a best practice, use Solutions Console mus for instructions.	the secure port to ac at be configured to us	cess the Administra se Secure Sockets L	ation Center. To use t ayer (SSL). See the T	ne secure port, the IB Tivoli Storage Manage	M Integrated er publications
Web administration po	rt (HTTP)				
8421					
Secure web administra	ation port (HTTPS)				
8422					
dallOhiald					
			< Back	Next >	Cancel

Figure 23-8 Select ports for ISC to use

Click **Next** to start the installation proper, as shown in Figure 23-9. The 1 to 2 hours of completion time was determined from an earlier Beta version of the installation. This has been improved for the GA version.



Figure 23-9 Installing the ISC

Once the installation has completed, you should see the window in Figure 23-10. Click **Next** to continue.

Integrated Solutions Console	
Tivoli Storage Manager	IBM.
Please read the summary information below.	
The InstallShield Wizard has successfully installed Inter	grated Solutions Console. Choose Next to continue the wizard.
InstallShield	
	< Back Next > Cancel

Figure 23-10 Installation completed successfully

The next window, shown again in Figure 23-11, confirms the installation and shows the address of the console and then prompts for the installation of the Administration Center. Click **Next** to continue.



Figure 23-11 Installation summary and login details

Note the default address of your ISC server: http://servername:8421/ibm/console

The servername is the network name of the machine you installed the ISC on.

Once the installation completes, clicking **Next** will launch the Integrated Solutions Console. Figure 23-12 shows the ISC Welcome window.



Figure 23-12 Automatically launched ISC Login page

# 23.3 Administration Center installation

Installation of the Administration Center is a similar process to the ISC install. It also begins with a Java installation, as shown in Figure 23-13.



Figure 23-13 Java Virtual Machine preparation

Next, the InstallShield Welcome window is displayed. This is displayed in Figure 23-14.Click **Next** to continue the installation.



Figure 23-14 Welcome to InstallShield Wizard for Administration Center

You are then presented with the Administration Center detailed Welcome window, as shown in Figure 23-15.

😵 Administration Center	
Tivoli Storage Manager	IBM.
Welcome	
The Administration Center is a Web-based interface that can be used to centrally configure and mar Storage Manager Version 5.3 servers. The Administration Center is installed as an IBM Integrated S component. The Integrated Solutions Console allows you to create custom solutions by installing c provided by one or more IBM applications.	nage IBM Tivoli Solutions Console omponents
Version 5.1 of the Integrated Solutions Console is required to use the Administration Center. If an e Integrated Solutions Console is already installed, use the Integrated Solutions Console CD in this p to version 5.1	arlier version of the package to upgrade
For the latest product information, see the readme file on the installation CD or the Tivoli Storage Ma support website (http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html).	anager technical
Installsheld Sack Next>	Cancel

Figure 23-15 Second Welcome with further details

To continue with the installation, click **Next**. Accept the International Program License Agreement, as shown in Figure 23-16, and again click **Next** to continue.

le Administration Center	<u>_                                    </u>
Tivoli Storage Manager	IBN.
Review License Information. Select whether to accept the license terms for this product. By accepting the term license, you acknowledge that you have thoroughly read and understand the license information.	ns of this
International Program License Agreement	<b>A</b>
Part 1 - General Terms	
BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE PROGRAM YOU AGREE TO THE OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHOR BIND THAT PERSON, COMPANY, OR LEGAL ENTITY TO THESE TERMS. IF YOU DO NOT AGREE TO THESE	ETERMS ITY TO ETERMS,
- DO NOT DOWINLOAD, INSTALL, COPY, ACCESS, OR USE THE PROGRAM; AND	
- PROMPTLY RETURN THE PROGRAM AND PROOF OF ENTITLEMENT TO THE PARTY FROM WHOM YOU	V
© I accept the terms of the license agreement	
C I do not accept the terms of the license agreement.	
InstallShield	
< Back Next >	Cancel

Figure 23-16 International Program License Agreement window

Once the agreement is accepted, the option to change the installation path and Web Administration Port is provided, as shown in Figure 23-17.

leader Administration Center	
Tivoli Storage Manager	IBM.
Review Integrated Solutions Console Configuration Information	
To deploy the Administration Center component to the IBM Integrated Solutions Console, the information the Integrated Solutions Console must be correct. Verify the following information.	on listed here for
IBM Integrated Solutions Console installation path: C:\Program Files/IBM/ISC	
IBM Integrated Solutions Console Web Administration Port: 8421	
IBM Integrated Solutions Console user ID: iscadmin	
© The information is correct.	
C I would like to update the information.	
InstallShield < Back	Cancel

Figure 23-17 Review install path, Admin port and user ID

If you have checked that the installation path, Administration port, and userid are correct, you will proceed to the next window, shown in Figure 23-18 below. Click **Next** to continue.

🞯 Administration Center	
Tivoli Storage Manager	TBM.
Enter the Integrated Solutions Console Password	
Enter the password for user ID iscadmin	
* Integrated Solutions Console user password	
* Verify password	5
InstallShield < Back	Cancel

Figure 23-18 Enter ISC password

The ISC password is the password assigned during the ISC install. Once entered, you will proceed to the Installation CD window to confirm its location, as shown in Figure 23-19.

🚳 Administration Center	
Tivoli Storage Manager	
Select the Location of the Installation CD	
Location of the installation CD	
Etacinstall	
	Browse
InstallShield	
	< Back Next > Cancel

Figure 23-19 Select location of installation CD

Click **Next** to show a final review of your chosen installation options before the installation can continue. The review window is shown in Figure 23-20.

**Important:** Once the final review has been displayed, clicking **Next** starts the installation, which *cannot* be stopped, once it is underway.

Administration Co	enter					<u>_</u> _X
ivoli Storaç	ge Manager					
Review the Instal The installation c summary informa	ation Options You Have Se an take between twenty and tion below.	elected. Installation of d thirty minutes to com	otions car oplete. Cli	inot be chang ck Next to sta	ed after the install t the installation. F	ation begins. Please read the
Administration C	enter will be installed in th	e following location:				
C:\Program	n Files\IBM\ISC					
with the following	) features:					
Administr	ation Center Deployment					
for a total size:						
301.3 MB						
stallShield ——				< Back	Next >	Cancel

Figure 23-20 Final review of selected installation option





Figure 23-21 Installation commences

Figure 23-22 shows that the installation has completed successfully. Click  $\ensuremath{\textit{Next}}$  to continue.

🚳 Administration Center	
Tivoli Storage Manager	IBM.
Please read the summary information below.	
The InstallShield Wizard has successfully installed Administration Center. Choose Next to continue	e the wizard.
InstallShield	
< Back Next >	- Cancel

Figure 23-22 Installation successful

#### Figure 23-23 shows the installation summary.

🚳 Administration Center
Tivoli Storage Manager
Installation Summary
The Administration Center has been successfully installed. To access the Administration Center, enter the following address in a supported Web browser:
http://bjktest:8421/ibm/console
The machine_name is the network name or IP address of the machine on which you installed the Administration Center
To get started, log in using the Integrated Solutions Console user ID and password you specified during the installation. When you successfully log in, the Integrated Solutions Console welcome page is displayed. Expand the Tivoli Storage Manager folder in the Work Items list and click Getting Started to display the Tivoli Storage Manager welcome page. This page provides instructions for using the Administration Center.
InstallShield
< Back Next > Cancel

Figure 23-23 Installation summary

As with the ISC installation, the ISC is automatically launched, as shown in Figure 23-24, when you click **Next**.

Integrated Solutions Console	
Welcome, please enter your information.	
User ID : iscadmin	
Password: ******	
Log in	700 13
Please note: After some time of inactivity, the system will log you out automatically and ask you to log in again.	120x1
	CANA
v	

Figure 23-24 ISC Login automatically appears following install

Figure 23-25 shows the first view of the expanded Tivoli Storage Manager plugin.

Welcome iscadmin	My Favorites 💽 Edit my profile Help	Log out				
Integrated Solutions Console		<b>IBM</b>				
Work Items Status Settings						
View : No group filter	Welcome					
Welcome Trivoli Storage Manager Getting Started Health Monitor Enterprise Management Storage Devices	Welcome         Integrated Solutions Console provides a common administration console for multiple products. The table lists the product suites that can be administered through this installation of the console         Image: the select action is the select actio					
Policy Domains and Client Nodes Server Maintenance Reporting	IBM Trool storage Manager - Administration Center       5.3.0.314         Page 1 of 1       Total: 2 Filtered: 2 Displayed: 2         Click here for more information on the Integrated Solutions Console and the installed components.					

Figure 23-25 First login showing expanded Tivoli Storage Manager component

# 23.3.1 Administering Tivoli Storage Manager server(s)

See "Managing Servers with the New Administration Center" in the *IBM Tivoli Storage Manager Installation Guide* for further details. See the following table for commands that are supported with some restrictions or are not yet supported:

### **Current restrictions in the Administration Center**

Table 23-1 lists the current restrictions in the Administration Center as of the date of publication of this redbook. Running these commands from the command line does not restrict their functionality.

Command	Supported in the Administration Server
AUDIT LIBRARY	No
CLEAN DRIVE	No
DEFINE COPYGROUP TYPE=ARCHIVE	Supported except for these parameters:
	RETINT
	RETMIN
	These parameters are needed only to support Tivoli Storage Manager for Data Retention
DEFINE DATAMOVER TYPE =SCSI	No
	This command is only needed to support configuration of server-free data movement on Windows servers
DEFINE STGPOOL	Supported except for the RECLAMATIONTYPE parameter
	This parameter is only required for EMC Centera devices
DELETE DATAMOVER	No
DISABLE SESSION	No
Event Logging commands (BEGIN	No
EVENTLOGGING, END EVENTLOGGING, ENABLE EVENTS, DISABLE EVENTS)	Some SNMP options can be viewed in the interface, in a server's properties notebook
ENABLE SESSIONS	No
ESTIMATE DBREORG	Noʻ
MIGRATE	Use the Server Maintenance work item to create a maintenance script that includes this action, or use the migration thresholds on storage pools
RESTORE VOLUME	Yes, except use the command line to restore random-access storage pool volumes
SET ACTLOGRETENTION	No

Table 23-1 Restricted or unsupported commands

Command	Supported in the Administration Server
SET QUERYSCHEDPERIOD	No
SET RETRYPERIOD	No
SET SCHEDMODES	No
SET SERVERNAME	No
SET SUMMARYRETENTION	No
SET TAPEALERTMSG	No
SET TOCLOADRETENTION	No
VALIDATE LANFREE	Use the Enable LAN-free Data Movement wizard to get this function

**Note:** Server options that can be modified by using the **SETOPT** command can be modified in the Administration Center. Other options can be viewed in the interface

#### Integrated Solutions Console considerations

The first step in administering Tivoli Storage Manager servers using the Integrated Solutions Console is to ensure that separate ISC Administrative user accounts are created. This is vital to the efficient running of the ISC Server.

Creating multiple users for both your ISC and Tivoli Storage Manager Server administrators is also useful for establishing which administrator performed a given command.

**Important:** Having multiple *iscadmin* users logged in using the same credentials will put a high CPU and memory load on your ISC server.

	Toolbar	
	Banner	
Navigation Tabs		
Group View		
Navigation Tree	Work Area	

The new interface consists of new elements which are illustrated in Figure 23-26.

Figure 23-26 Layout of new interface

The Tivoli Storage Manager plugin should be displayed when you open the ISC for the first time. Clicking the Tivoli Storage Manager icon expands the view, as shown in Figure 23-27.

Welcome iscadmin	M	ly Favorites	•	Edit my profile	Help   Log out
Integrated Solutions Console					IE)
Work Items Status Settings					
View : No group filter	Welcome				
Welcome	Welcome				
Tivoli Storage Manager Getting Started	Integrated Solutions Conso products. The table lists the installation of the console.	e provides a com product suites th	imon ac hat can l	Iministration cons be administered t	ole for multiple hrough this
Health Monitor		Suite Name			Version
	Integrated Solutions Conso	le			5.1
Enterprise Management	IBM Tivoli Storage Manage	r - Administration	Center		5.3.0.321
Storage Devices	Page 1 of 1	Total: 2 Dis	played:	2	
Policy Domains and Client Nodes					
Server Maintenance					
Reporting	Click here for more informa components.	tion on the Integ	rated So	olutions Console a	ind the installed

*Figure 23-27 Tivoli Storage Manager plug-in expanded view* 

From the expanded view, clicking the Getting Started link displays the Welcome! window shown in Figure 23-28.



Figure 23-28 Getting Started window in ISC

The Welcome window in the work area gives you some instructions on how to perform some basic tasks. The View Tutorial links will open the relevant Flash Demo for that task. The tasks listed in this window are:

- Add a server connection
- Add storage devices
- Setup automatic data migration
- Create a server maintenance script
- Register client nodes
- Create a client node schedule
- Setup database and recovery log space triggers

**Important:** Notice the **View Tutorial** links on the Welcome page. The tutorials provide vital instruction in performing the tasks listed in the Welcome page. It is strongly advised that the Tivoli Storage Manager Administrator follow these tutorials before using the new Administration Center.

The Administration Center provides several other features that can help you monitor and manage your storage management environment:

- To centrally manage multiple Tivoli Storage Manager servers from a single server, click Enterprise Management in the Work Items list.
- To monitor Tivoli Storage Manager server status, click Health Monitor in the Work Items list.
- To generate usage and security reports for your Tivoli Storage Manager servers, click **Reporting** in the Work Items list.

For more screen "real estate", the Navigation window can be contracted using the icon shown in Figure 23-29.



Figure 23-29 Contract navigation frame

Figure 23-30 shows the Navigation window contracted to give the portlet more space on the screen.

Welcome iscadmin	My Favorites 💽 Edit my profile   Help   Log out
Integrated Solutions Console	
Gettinx	< > 6
Getting Started	Close page
Welcome!	
Tivoli Storage Manager	
Administration Center	
*Welcome!	
Use the Administration Center to centrally configure and manage your IBM Tivoli Storage Manager enviro you through common configuration tasks. Properties notebooks allow you to modify settings and perform	onment. The Administration Center provides wizards to help guide m advanced management tasks.
iii Add a server connection	
After a server is installed and started, you can add it to the Administration Center.	
1. Click Storage Devices in the Work Items list to the left.	
<ol><li>In the Servers table that is displayed, click Select Action, select Add Server Connection, and cli</li></ol>	ick Go.
III Add storage devices	
After adding a server, use the Add a Storage Device wizard to configure the storage devices the server v consider using disk storage as a first destination for stored data. You can then set up migration, which traffic is low.	will use to store client node data. As a best practice, can automatically move data to a tape device when network
1. Click Storage Devices in the Work Items list.	
2. In the Libraries table, click Select Action, select Add a Storage Device, and click Go.	
3. Select a server and click the Add a Storage Device button. Use the wizard to add a device with a	a device type of DISK.
<ol> <li>Start the wizard again and add a tape device that is installed and available to the server. The wiz data stored by this device.</li> </ol>	zard will help you create a copy storage pool to protect the

# 23.4 Quick start tips

Information similar to the following sections, without illustrations, can be found in the Administrator's Guides for each platform in the chapter, Getting Started with Tivoli Storage Manager. A section entitled Quick paths to creating Tivoli Storage Manager objects details many other useful tasks.

# 23.4.1 Creating multiple ISC Admin login accounts

For the optimum performance of your ISC server, you need to create multiple Administrative login accounts. The following steps show how this is done.

1. Click the **Settings** tab from the Navigation Tabs pane shown in Figure 23-31.

Welcome iscadmin		My Favorites	<b>•</b>	Edit my profile	Help   Log out
Integrated Solutions Console					
Work Items Status Settings					
View : No group filter	Welcome				
User and Group Management Resource Permissions User and Group Permissions	welcome Integrated Solutions Conso products. The table lists the installation of the console.	le provides a com e product suites th	mon adm at can be	inistration console administered thro	for multiple ugh this
		Suite Name			Version
Enable Tracing	Integrated Solutions Conse	ole			5.1
Credential Vault	IBM Tivoli Storage Manage	r - Administration	Center		5.3.0.321
	Page 1 of 1	Total: 2 Disp	olayed: 2		
	Click here for more informa components.	tion on the Integr	ated Solu	tions Console and	the installed

Figure 23-31 Click Settings in the Navigation Tab

2. Click **User and Group Management** in the Navigation Tree, as shown in Figure 23-32.

Welcome iscadmin		My Favorites	•	Edit my profile	Help	Log out
Integrated Solutions Console						IBM.
Work Items Status Settings	User a×					< > B
View : No group filter	User and Group Managem	ent				<u>Close page</u>
User and Group Management Resource Permissions User and Group Permissions Enable Tracing Credential Vault	Manage Users and Groups Search for: User groups • Search on: All available • Search Root New group					<i>₹</i> /? = 0
			sł	nowing 1 - 2 of 2	Page	1 of 1
	ID					
	M all portal user groups					
	🦓 all authenticated port	al users				
			sł	nowing 1 - 2 of 2	Page	1 of 1

Figure 23-32 Manage Users and Groups portlet

#### 3. Click "all authenticated portal users", as shown in Figure 23-33.

Welcome iscadmin	My Fav	orites 💽 🗌 Edit my profile	Help Log out
Integrated Solutions Console			IEM.
Work Items Status Settings	User a		< > B
View : No group filter	User and Group Management		<u>Close page</u>
User and Group Management Resource Permissions User and Group Permissions	Manage Users and Groups Root > all authenticated portal user Members of all authenticated portal	<b>rs</b> users - add, edit and delete user	Journal of the service of the servic
Enable Tracing Credential Vault	💥 New user	Showing 1 - 8 of 8	Page 1 of 1
	ID		
	com.ibm.isc.admin.security1_00025	55C6FBCF	
	shayne		1 🖫 🕗 🖉 🛍
	com.ibm.isc.admin.resourcepermis:	sions_000255C6FBCF	ii 🖫 🛃 🖉 🛍
	com.ibm.isc_000255C6FBCF		1 🖻 🖸 🖉 🛍
	com.tivoli.dsm.admincenter_00025	5C6FBCF	1 🖻 🖸 🖉 🛍
	iscadmin		1 🖻 🗹 🛍
	gerd		1 🖻 🗹 🔎
	com.ibm.wps.portlets.manageprinci	ipals.1_000255C6FBCF	1 🖻 🖉 🖉 🛍
		Showing 1 - 8 of 8	Page 1 of 1

Figure 23-33 All authenticated users view

4. Click the New user button, as shown in Figure 23-34.

User and Group Management
Manage Users and Groups
Root > all authenticated portal users
Members of all authenticated portal users - add, edit and delete user groups and u
ID
com.ibm.isc_000255C6FBCF
com ibm icc admin recourses provinciana, 000255045805

Figure 23-34 New user button

5. Enter the details of the new ISC administrator, as shown in Figure 23-35.

Welcome iscadmin		My Favorites	•	Edit my profile	Help   Log out
Integrated Solutions Console					IBM.
Work Items Status Settings	User a				< > B
View : No group filter	User and Group Managemer	nt			<u>Close page</u>
User and Group	Manage Users and Groups				7/?-0
Resource Permissions User and Group Permissions Enable Tracing Credential Vault	Provide user information  * User ID: newadminuser  * Password: ******  * Confirm Password: ******  * First Name: Mike * Last Name: Hanley Email: *Required Field  OK Cancel				

Figure 23-35 ISC Admin user details

6. You can change the group and role assignments of an existing user using the icons in the Manage Users and Groups portlet, which is shown in Figure 23-36.

Manage Users and Groups		1	1- ? / ٩
Root   all authenticated portal users			
Members of all authenticated nortal users - add, edit and delete user groups and users			
* New user			
Sha	wing 1 - 9 of 9	Page 1 d	of 1
ID			
com.ibm.isc_000255C6FBCF		<b>聖</b>	/ û
com.ibm.isc.admin.resourcepermissions_000255C6FBCF	11	<b>B</b>	/ 1
gerd		<b>B</b>	/ 1
shayne		<u>n</u>	/ 1
armin	**	<b>N</b>	/ 1
com.tivoli.dsm.admincenter_000255C6FBCF	100	5 B	/ 1
com.ibm.isc.admin.security1_000255C6FBCF		<u>n</u>	/ 1
com.ibm.wps.portlets.manageprincipals.1_000255C6Fe		5 5	/ 1
iscadmin		<b>聖</b>	/ 1
Sha	wing 1 - 9 of 9	Page 1 d	of 1

Figure 23-36 All authenticated portal users Icons

The icons illustrated are:

- 1. View membership
- 2. Duplicate group assignments
- 3. Duplicate role assignments
- 4. Edit
- 5. Delete

Duplicating the group and role assignments of an existing user will give the target user the authority of the source user selected.

## 23.4.2 Creating multiple Administrator accounts

Creating multiple Tivoli Storage Manager Administrator accounts gives accountability with the ability to track which Administrator performed which action. This can be helpful when troubleshooting. Follow these steps to create multiple accounts:

- 1. Click Enterprise Management in the Work Items list.
- 2. In the Servers table, select a server.
- 3. Click Select Action, select Server Properties, and click Go.
- 4. In the server's properties notebook, click the Administrators tab.
- 5. In the table, click Select Action, select Add Administrator, and click Go.
#### 23.4.3 Creating a Tivoli Storage Manager Server link

A link has to be created for each Tivoli Storage Manager server you wish to administer. The ability to manage multiple servers depends on the service name chosen for your servers. The default server service name Server1 must be changed for multiple servers to be addressed. Note that the Tivoli Storage Manager installation wizard does not allow this service name to be changed during the installation of the first server.

These are the steps you follow to create a Tivoli Storage Manager Server link:

- 1. Open the Integrated SC and expand the Tivoli Storage Manager Group View in the Navigation Tree.
- 2. Click Enterprise Management.
- 3. In the Enterprise Management portlet, select **Add Server Connection** from the drop-down menu, as shown in Figure 23-37.



Figure 23-37 Enter server name and admin details

4. Notice the check box, "Unlock the ADMIN\_CENTER administrator on the server to allow the health monitor to report server status".

### 23.4.4 Creating a library

Follow these steps to create a Tivoli Storage Manager Library:

- 1. Select **Storage Devices** in the Navigation Tree of the Work Items Navigation Tab
- 2. Choose Add a Storage Device from the drop-down menu.
- 3. Select the server that will use the Storage Device. (This will be the server you previously created in the Server Link section) and click the **Add a Storage Device** button.
- 4. The **Add Storage Device** wizard will then be displayed, as shown in Figure 23-38 to step you through the setup process.

Welcome	Servers	240
🗁 Tivoli Storage Manager	Select a server and use the table action list to work with its storage pools, devi that have been added to the console.	ce classes, and data movers. The table shows all servers
Getting Started	👾 🧐 🖉 🕤 音 🛛 Select Action 🔽 Go	
Health Monitor 🔍	Salart A Server Name A Storage Bool Count A	euice Class Coupt A
Enterprise Management		-
Storage Devices	POLONIUM1	
Policy Domains and Client Nodes	Page 1 of 1 Total: 1 Filtered: 1 Displayed: 1 Selecte	d: 0
Server Maintenance		
Reporting	Add Storage Device	250
	To add a storage device, you must define several available media. The definitions are stored in the device. Adding a device includes the <ul> <li>Select the device type</li> <li>Define a library</li> <li>Define the library's drives</li> <li>Label and check in media volumes</li> <li>Define storage pools for the media</li> </ul> < Back Next > Finish Cancel	objects that are used to represent the device and its server database and used to manage operations for the e following tasks: volumes

Figure 23-38 Add Storage Device wizard

5. Click **Next** to start the wizard and the initial window will be shown as seen in Figure 23-39.

Add Storage Device	2120
→ Select a device type Add a library	Select a Device Type Select the type of device you are adding. You can share a device that has been defined to another server, or create a new device definition for this server. To share a device, some additional configuration tasks must be performed. See this vizard's online help (click the ? icon) for a link to instructions for sharing a library.
Add drives Add volumes Set up storage pools Summary	Define a storage device to POLONIUM1     *Device type
	3590 (uses IBM 3590 tape cartridges)
	Device type 3570 (uses IBM 3570 tape cartridges)
< Back Next > F	inish Cancel

Figure 23-39 Select Device Type

6. Enter the local or shared device type in the appropriate selection box. Clicking **Next** will then display the Define the Library page, as shown in Figure 23-40.

Add Storage Device	2
✓ Select a device type	<b>Define the Library</b> A library represents a storage device that contains drives. You cannot change a library name or type after it has been defined.
→ Add a library Add drives Add volumes	*Library name TSMLIB01
Set up storage pools Summary	Library type © SCSI (uses SCSI commands over a SCSI or fibre channel connection. Includes most automated libraries that do not fit into another category.) © Manual (no media changer) © 349X (IBM 3494 tape library) © ACSLS or LibStation (StorageTek) © External (managed by an external media management system)
< Back Next > Fi	nish Cancel

Figure 23-40 Define Library

7. Enter the library name and type and click **Next** to display the SCSI library settings window illustrated next in Figure 23-41.

Add Storage Device	2
<ul> <li>✓ Select a device type</li> <li>→ Add a library</li> <li>Add drives</li> <li>Add volumes</li> <li>Set up starsee peole</li> </ul>	SCSI Library Settings         You must enter a device name for the library as it is known to the server (for example, Ib0.1.2.3). You can use the Device Driver section of this product's Microsoft Management Console (MMC) snap-in to obtain this name. The device name is used to define a path, which allows the server to access the library.         Image: The device name is used to define a path, which allows the server to access the library.         Image: Clicking the Next button will define the library. If successful, you will not be able to return to this panel to modify settings. You can use the library's properties notebook to update library settings.
Summary	*Device name [b0.1.0.4]  Allow other servers and storage agents to use this library
	< Back Next > Finish Cancel

Figure 23-41 Define SCSI settings

8. Enter the SCSI address of the library and optionally check the box if shared. Click **Next** to display the Library Defined window shown in Figure 23-42.

Add Storage Device	2 = 0
. Calastia device tura	Library Defined The library has been successfully defined.
<ul> <li>Select a device type</li> <li>Add a library</li> <li>Add drives</li> <li>Add volumes</li> <li>Set up storage pools</li> <li>Summary</li> </ul>	Library Information Library Name: 3590LIB Device Class Name: 3590_CLASS_1 Device Type: 3590 Library Type: SCS1 Device Name: Ib0.1.0.4
	< Back Next > Finish Cancel

Figure 23-42 Library successfully defined

9. To continue the wizard and define drives, click Next.

10.Open the drop-down menu, as shown in Figure 23-43, select **Add Drive...** and click **Go**.



Figure 23-43 Add Drive

11. The Create a library wizard continues, showing the Add Device Information page as displayed in Figure 23-44. Enter the Drive name and Device name in the relevant fields. Enter the Drive element address if required (in most cases this can be automatically detected). Click the Add Another button to add more drives if required, or OK to stop adding drives.



Figure 23-44 Add drive detail

12.]The window shown in Figure 23-45 is displayed once all the drives have been added.

Welcome Admin User				My Favorites	-	Edit my profile Help Log o	ut
Integrated Solutions Console							ſ٨.
Work Items Status Settings	=	Storag < ×					- B
View : No group filter	ί.	Storage Devices				Close	page
Welcome		Create a Library				2.	- 0
🗁 Tivoli Storage Manager		🗸 Create a library	Define Drives	cific obysical drive mechanism within :	librar	и.	
Getting Started		→ Add drives			, nordi		
Health Monitor	4	Summary	*****	📄 👕 🛛 Select Action 💽	Go		
Enterprise Management	-		Select ^	Drive Name 🔿		Device Name	
Storage Devices			۲	DRIVEO	mt	0.2.0.2	
Policy Domains and Client Nodes			Page 1 of 1	Total: 1 Filtered: 1 Display	ed: 1	Selected: 1	
Server Maintenance							
Reporting		< Back Next > F	nish Cancel				

Figure 23-45 Drive added

13.Click **Next** to proceed to the **Library Created Successfully** page shown in Figure 23-46.



Figure 23-46 Wizard completed

14. The **Library Created Successfully** page shows the library and drive details that have been defined. Click **Finish** to close the wizard.

#### 23.4.5 Creating an additional storage pool

To create an additional storage pool, you use the **Add a Storage Device** wizard. This wizard helps you create the objects that the server needs to use a new device, including a library, drives, paths, a device class, and storage pools.

To launch the wizard, follow these steps:

- 1. Choose Storage Devices in the Navigation Tree.
- 2. Select the server you wish to add the Device Class to (if you have more than one server defined).
- 3. Choose Add a Storage Device from the drop-down menu, as shown in Figure 23-47, and click Go.

Welcome Admin User					My Favorites	🔹 🕴 Edit i	my profile 丨	Help   Log out
Integrated Solutions Console								IEM.
Work Items Status Settings	Storag	itorag×						< > B
View : No group filter	Storage De	Storage Devices Close page						
Welcome	Servers							?==
🗁Tivoli Storage Manager	Select a se that have b	ver and use the table a een added to the cons	action list ole.	to work with its storage pool	s, device classes	, and data move	rs. The table	shows all servers
Getting Started	***	/ <b>/ /    </b>	Add a Sto	orage Device 💌 🕢	ào			
Health Monitor	Select /	Server Name	•	Storage Pool Count \land	Device Clas	s Count 🔨	Data Mo	ver Count 🔿
Enterprise Management	0	CRETE1	5		2		-	
Policy Domains and Client Nodes	0	POLONIUM1	8		5		-	
Server Maintenance	Page 1	of 1	Total: 2	Filtered: 2 Displayed: 2	Selected: 0			
Reporting								

Figure 23-47 Add a Storage Device drop-down menu

#### Welcome Admin User My Favorites 🔹 🕴 Edit my profile Help Log out TEM. Integrated Solutions Console Work Storag.....× Storag.....× < > B Status Settings Items Storage Devices Close page View : No group filter -Add Storage Devi Welcome Add a Storage Device 🗁 Tivoli Storage Manager To add a storage device, you must define several objects that are used to represent the device and its available media. The definitions are stored in the server database and used to manage operations for the Getting Started Health Monitor Enterprise Management Adding a device includes the following tasks: Storage Devices Select the device type Define a library Define the library's drives Label and check in media volumes Define storage pools for the media volumes Policy Domains and Client Nodes Server Maintenance Reporting < Back Next > Finish Cancel

The Wizard should now be displayed as seen in Figure 23-48.

Figure 23-48 Add a Storage Device Wizard

- 4. Click the Next button to start the Wizard process.
- 5. Choose the storage device type from the drop-down menu lists shown in Figure 23-49. Notice the ability to use a device on another Tivoli Storage Manager Server for virtual volume definitions.



Figure 23-49 Choose device type and location

6. Define the volume, as shown in Figure 23-50.



Figure 23-50 Create or Add volume

7. Figure 23-51 shows the Add Storage Device window during new storage pool creation.

Welcome Admin User		My Favorites 💽 Edit my profile   Help   Log out
Integrated Solutions Console		
Work Items Status Settings	Storag、× Storag、×	
View : No group filter 💌	Storage Devices	<u>Close page</u>
Welcome	Add Storage Device	7-0
🗁 Tivoli Storage Manager		Add Disk Volume to a Storage Pool
Getting Started	🗸 Select a device type	to designate where all managed data will be stored. If a new volume is being created, the process can take
Health Monitor	Add a library	some ame to complete. To monitor the process, use the process tab of the server's properties notebook.
Enterprise Management	Add drives	
Storage Devices	Set up storage pools	O Add the disk volume to an existing storage pool
Policy Domains and Client Nodes	Summary	Name
Server Maintenance		ARCHIVEPOOL V
Reporting		
		• Add the disk volume to a new storage pool
		*Name
		NEWSTG
		<back next=""> Finish Cancel</back>

Figure 23-51 Add to existing or new storage pool

8. Click **Next** to complete the creation of the new storage pool and new storage pool volume and the window shown in Figure 23-52 will be displayed.



Figure 23-52 Successful completion of wizard

#### 23.4.6 Adding drives to an existing library

Follow these steps to add drives to an existing library:

- 1. Click Storage Devices to display the Libraries for All Servers portlet.
- 2. Select the library you wish to add the drives to using the Select radio button.
- 3. Open the drop-down menu, select **Modify Library** as seen in Figure 23-53 and click **Go**.

Policy Domains and Client Nodes	0		11		5		-	
Server Maintenance	Page 1 of	1	Total: 2 P	Filtered: 2 Displayed: 2	Selected: 0			
Reporting								
	Libraries for A	ll Servers						? - 🗆
	A server uses storage devices to store data for client nodes. Libraries and drives represent storage devices to the server. The ta shows libraries for all servers that have been added to the console. There are two ways to add a library. Use the Add a Storage table action to create the library and its drives, create a storage pool, and add media. Use Create a Library to create only the lii its drives.							ble Device Wary and
	***	/ 🛛 🖿 🖶	Modify Libr	ary 🔽 Go				
	Select ^	Library Name \land	Status ^	Library Manager \land	Library Clients \land	Scratch Volume	es ^ Private Volun	nes ^
	۲	TSMLIB01	Normal	POLONIUM1	-	2	6	
	Page 1 of	1	Total: 1 F	Filtered: 1 Displayed: 1	. Selected: 1			

Figure 23-53 Modify Library drop-down selected

4. In the **Library properties** portlet, click **Drives** to open the portlet as seen in Figure 23-54.

🕂 🌮 🖉 🖻 👕 🔚 Select Action 🔽 Go									
Select ^ Library Name	^ Status ^	Library Manager 🛆	Library Clients 🔿	Scratch Volumes \land	Private Volumes \land				
• III	Normal	POLONIUM1	-	2	6				
Page 1 of 1 Total: 1 Filtered: 1 Displayed: 1 Selected: 1									
This portlet will refresh in 2	This portlet will refresh in 2 minutes and 51 seconds.								
TSMLIB01 Properties (POL	ONIUM1)				? – 🗆 🗙				
<u>General</u> Drives	General A library represer after it has been	its a storage device tha defined.	at contains drives. Yo	u cannot change a libra	ry name or type				
Library Paths Drive Paths	brary Paths Name Library type TSMLIB01 SCSI								
Volumes Cleaning Cartridges	World wide name Serial number C Automatically detect the serial number when the library's path is defined. Use the following serial number IBM7801954								
Automatically label volumes Yes No Yes, and overwrite existing volume labels Last Updated By GERD Last Updated On 11/30/04 2:37:03 PM PST Share this library									
OK Apply Cancel									

Figure 23-54 Library properties portlet

5. Choose Add a Drive from the drop-down menu, as shown in Figure 23-55, and click **Go**.

🖷 😤 🦼	2 1	Select A	ction 💌	Go		
Select ^ Lib	rary Name	^ Status ^	Library Manager	↑ Library Clie	nts ^ Scratch Volun	nes ^ Private Volumes ^
•	TSMLIB01	Normal	POLONIUM1	-	2	6
Page 1 of 1		Total: 1 F	iltered: 1 Display	ed: 1 Selected:	1	
his portlet will re	efresh in 4 m	ninutes and 53 s	econds.			
TSMLIB01 Prope	rties (POLON	NUM1)				2.0
General		Drives	1			
Drives		Use this table to library,	work with drives, A	A drive represents	a specific physical drive	mechanism within a
Library Paths				-		
Drive Paths			2 2 🔳 着	Add a Drive	Go Go	
<u>Volumes</u>		Select ^ Dri	ve ^ Online ^	State ^ Mounte	d Volume 🔿 Number	of Paths 🔿 Allocated to 🥎
Cleaning Cartr	<u>ridges</u>	O <u>dr</u>	IVE01 🗸	Empty	2	
		Page 1 of	1 Т	otal: 1 Filtered:	1 Displayed: 1 Selec	ted: 0
OK Apply	Cancel					

Figure 23-55 Add drive drop-down menu

6. Enter the drive details, including element number and cleaning regime. A screen capture of this process is illustrated in Figure 23-56.

A server use shows librari table action its drives.	es storage devices to es for all servers tha to create the library	store data fo at have been and its drives	or client nodes. Librarie: added to the console. 7 s, create a storage pool	s and drives represen There are two ways to I, and add media. Use	t storage devices to the add a library. Use the e Create a Library to cre	a server. The table Add a Storage Device aate only the library and				
***	👾 🌮 🖉 📄 👕 🖅 Select Action 🔽 Go									
Select ^	Library Name \land	Status ^	tatus ^ Library Manager ^ Library Clients ^ Scratch Volumes ^ Private Volumes							
۲	TSMLIB01	Normal	POLONIUM1	-	2	6				
Page 1	of 1	Total: 1 F	iltered: 1 Displayed: :	1 Selected: 1						
This portlat	will refrech in 4 minu	ites and 41 s	ocondo							
This portiet	win refrestrint 4 finne	ites and 41 s	econds.							
TSMLIB01 P	roperties (POLONIU	M1)				?-DX				
Add a Drive										
You must pr	ovide a unique nam	e to identify t	he drive. Enter a device	e name or device spe	cial file name if you war	nt to define a				
padr to the .	unve nom uns serve									
*Name		Device nar	me							
DRIVE02										
World wide	e name	Serial num	iber							
		Autom	atically detect the serial	l number when the dr	ive's path is defined.					
		O Use the	e following serial numb	er						
			_							
Drive ele	an ant address									
	entent address	anaat ayaab	a from the device							
<ul> <li>Autom</li> </ul>	addany detect the en	ement numb	er from the device							
* Use th * 257	ie following element 7	number								
Cleaning	cartridge manageme	int								
• Not managed by the server										
O Load cleaning cartridge when requested by the drive										
C Load o	leaning cartridge aft GB	er the drive h	as processed the follow	ving amount of data:						
OK Ca	ncel									

Figure 23-56 Enter drive details

7. Notification is given when the drive is added successfully, as shown in Figure 23-57.



Figure 23-57 Drive successfully added

#### 23.4.7 Creating or modifying an option set

A client node connects with the server by using the information in a client options file (dsm.opt). This file, located in the client directory, contains client options that control processing and connections with the server. The most important option is the network address of the server, but you can add many other client options at any time.

Administrators can also control client options by creating client option sets on the server that are used in conjunction with client option files on client nodes.

- 1. Click Policy Domains and Client Nodes in the Navigation Tree.
- 2. Click the Server name icon or select **View Policy Domains** from the drop-down menu.

3. In the Server Policy Domains portlet, click the appropriate Policy Domain in which to create your option set, as shown in Figure 23-58.



Figure 23-58 Policy Domain properties during option set creation

- 4. The drop-down menu offers several choices: Create an Option Set, Create Like Option Set, Modify Option Set... or Delete Option Set.
- 5. Create an Option Set starts a wizard to create your option set and Create Like Option Set will also start a wizard if an option set already exists.
- 6. The wizard will step through the process of creating an option set providing pertinent choices with regard to option set name and operating system.
- Once these have been chosen the options and their values can be chosen relevant to the operating system or environment — for example, DOMAIN statements or Pre-Schedule or Post-Schedule commands.
- 8. Include or Exclude filters can also be applied and relevant values are checked.
- 9. Any number of client nodes can be assigned to the option set.
- 10. The summary of the information entered is displayed before the option set creation is complete.

**Note:** Be aware that selecting more than one option set for deletion will result in all selected option sets being deleted.

#### 23.4.8 Unlocking a client node

Follow these steps to unlock a client node:

- 1. In the Navigation Tree, click **Policy Domains and Client Nodes**.
- 2. Select the appropriate server using the **Select** radio button.
- 3. Choose **Search for Client Node** from the drop-down menu, as shown in the upper pane in Figure 23-59.
- 4. Enter the name or part of the name, the node type Client, Server, or NAS, for example of the node you wish to unlock.
- 5. Select the node using the **Select** radio button, choose the **Modify Client Node** option from the drop-down menu shown in the lower pane in Figure 23-59, and click **Go**.

Welcome	Policy Domain	s				2 = 1			
PT well Observe Menseeve	The table show	The table shows the servers you have added to the console, and the policy domains defined for those servers. Policy domains help you to apply consistent rules for data management to groups of dient podes. Click a server name to work with its policy domains.							
Moli Storage Manager	to apply consis								
Getting Started	# # (	1 2 🕤	Search for Client Node	🔽 🤇	30				
Health Monitor	Select ^	Server N	ame ^		Poli	cy Domains			
Enterprise Management	0	1				-,			
Storage Devices	0	CRE	DOM_ITSO_LANFF	EE, DOM_I	ISO_UNIX, DOM	M_ITSO_WIN, STANDARD			
Policy Domains and Client Nodes	•	DOM_ITSO_LANFREE, DOM_ITSO_UNIX, DOM_ITSO_WIN, STANDARD, test							
Server Maintenance	Page 1 of	1	Total: 2 Filtered: 2	Displayed:	2 Selected: 3	1			
Reporting									
	Search for a C	lient Node				? - D)			
	Search for a C Use the contro	lient Node Is to expand	or limit the client nodes to di	splay, and	dick Update Ta	able.			
	🗹 Name	*							
	Tune	Client							
	Undate T	able							
	Client Node:								
			Y 🖉 🔳 👕   Modify Cli	ent Node	Go Go				
	Select ^	Name 🔿	Current Policy Domain \land	Type ^	Platform ^	Description ^			
		CHICO	DOM_ITSO_WIN	Client	(?)				
		CRETE	DOM_ITSO_LANFREE	Client	AIX	its0-team aix-client,kris@island.com,Kris,0			
		CRETE1	DOM_ITSO_UNIX	Client	AIX	agent-node for crete			
		CRETE2	TEST	Client	AIX	agent node for crete			
		JAYKE	STANDARD	Client	WinNT	my.bro@free.com,Jayke,0			
		KATHY	DOM_ITSO_LANFREE	Client	WinNT	ITSO-Team for Windows,,,0			
		NIKKI	STANDARD	Client	(?)	mrs@scarey.com			
		POLONIUM	STANDARD	Client	WinNT	santa@klos.com,Armin,0			
		RAPHAEL	STANDARD	Client	WinNT				
		RESIRT4	DOM_ITSO_WIN	Client	WinNT	ITSO Team			
		RESIRT4A	DOM_ITSO_WIN	Client	(?)	itso-team			

Figure 23-59 Search for client node

6. Choose **Security** in the Client Properties portlet and you will be presented with the window shown in Figure 23-60.

AYKE Properties	7 - 0							
General	Security							
Security	Users must have a password to log a dient node onto the Tivoli Storage Manager server if you have set authentication on for the server. You can reset passwords and change other security settings for the dient pode.							
<u>Communications</u>								
<u>Schedules</u>	Refuse actions from the client node. This option will not allow backups or any other action to be							
File Spaces	performed							
Backup Sets	New Password Invalid Sign-on Attempts							
Statistics	5							
Advanced Settings								
Proxy Authority	Verify assessed							
	12/1/04 4:42:42 PM PST							
	Descword evolvation							
	O Server's expiration period ( 186 Dav(s))							
	Never							
	O Evolve the password in							
	davs							
	Force password reset?							
	Administrators							
	🕞 🖻 🌞 🥰 🖉 👕 📅 🔤 Select Action 🔽 Go							
	Select ^ Name ^ Authority Level ^							
	Total: 0 Filtered: 0 Displayed: 0 Selected: 0							
OK Apply Cancel								

Figure 23-60 Uncheck the Refuse actions check box

- 7. Uncheck the Refuse actions from the client node check box.
- 8. Click the Apply button to successfully unlock the node.

The node is now successfully unlocked.

#### 23.4.9 Check-in and label volumes

To check in and label volumes, follow these steps:

- 1. Click Storage Devices in the Work Item list.
- 2. In Libraries for all Servers, click the library name you require.

TSMLIB01 Properties (POL	ONIUM1)	? - DX
General	General	
<u>Drives</u>	A library represents a storage de after it has been defined.	evice that contains drives. You cannot change a library name or type
Library Paths	Name	Library type
Drive Paths	TSMLIB01	SCSI
Volumes Cleaning Cartridges	World wide name	Serial number
<u>orcanniq oaranaqeo</u>		<ul> <li>Automatically detect the serial number when the library's path is defined.</li> </ul>
		• Use the following serial number
		IBM7801954
	Automatically label volumes C Yes © No C Yes, and overwrite existing	j volume labels
	Last Updated By	Last Updated On
	Share this library	11/30/04 213/103 Pm P31
OK Apply Cancel		

Figure 23-61 Library properties portlet

- 3. In the library's properties portlet displayed in Figure 23-61, click the **Volumes** option in the navigation list on the left hand side.
- 4. In the Volumes portlet, click the **Select Action** drop-down as seen in Figure 23-62, select **Add Volumes** from the drop-down menu and click **Go**.

General Drives	Volumes The table sho single unit of	ws the volu storage m	umes that has edia, such as	ve been check a tape cartrid	ed into the lib ge.	rary's volume inver	ntory. A volume r	epresents a
Library Paths Drive Paths	QC		1 2 1	Add V	Volumes	J Go		
<u>Volumes</u>	Select ^	Name 个	Category ^	Owner ^	Last Use \land	Home Element \land	Device Type \land	Media Type \land
Cleaning Cartridges		ABA920L1	Private	POLONIUM1	DbBackup	4,110	LTO	387
		ABA922L1	Private	POLONIUM1	Data	4,104	LTO	387
		ABA923L1	Private	POLONIUM1	Data	4,102	LTO	387
		ABA924L1	Private	POLONIUM1	Data	4,107	LTO	387
		ABA926L1	Private	POLONIUM1	DbBackup	4,105	LTO	387
		ABA928L1	Private	POLONIUM1	Data	4,106	LTO	387
		ABA929L1	Private	POLONIUM1	DbBackup	4,108	LTO	387
		ABA990L1	Private	POLONIUM1		4,109	LTO	387
	Page 1	of 1	Tot	al: 8 Filtered	: 8 Displaye	d: 8 Selected: 0		

Figure 23-62 Add volumes drop-down

5. The Add volumes wizard is then launched, as shown in Figure 23-63.



Figure 23-63 Add volumes wizard

- 6. Select whether volumes are already labelled or not labelled.
- 7. Choose how the library should search for the volumes using the Volume Search Options element of the wizard shown in Figure 23-64.



Figure 23-64 Add volumes labelling details

8. Choose how to label and check in the volumes. Note that overwrite is not enabled by default, as shown in Figure 23-65.



Figure 23-65 Label and check in volumes

9. Accept or change the value for waiting for a volume to be mounted. The default value is 60 minutes, as seen in Figure 23-66. More details regarding the Wait time value can be found in 3.4.3, "Check-in and check-out enhancements" on page 43.



Figure 23-66 Set waittime for mounts

- 10. The wizard process is completed once the **Finish** button is clicked, and the final window is displayed, as shown next in Figure 23-67.
- 11. After that, clicking the **Server Processes** navigation option will allow you to check the process status to ensure that the process has been completed. The image in Figure 23-68 illustrates this.

TSMLIB01 Properties (POL	ONIUM1) ? - 🗆 🗙
<ul> <li>Check in volumes</li> <li>Advanced Options</li> </ul>	Summary The volume discovery process has started. To update volume information, open the library's properties notebook and select the Volumes tab.
→ Summary	Volume discovery process started as process 85. To view the status of the process open the server's properties notebook and select the Process tab.
< Back Next > Fi	nish Cancel

Figure 23-67 Discovery process started

POLONIUM1 Server Propertie General Server Processes Client Node Sessions Activity Log Communications Event Logging Security Administrators Database and Log Scripts Administrative Schedules License	Server Processes         The table shows currently running processes. The server starts a process for each task it performs.         Higher priority processes can preempt lower priority processes.         Image: Ima
OK Apply Cancel	

Figure 23-68 Server process status

#### 23.4.10 Tivoli Storage Manager Client remote access

Tivoli Storage Manager Client remote access is a useful tool that allows Tivoli Storage Manager Administrators to restore or retrieve data on a remote node without the need for the local user to be present.

1. Open the **Policy Domains and Client Nodes** portlet from the Navigation Tree, as shown in Figure 23-69.

Address 🙋 http://radon:8421/ibm/console	e/lut/p/_s.7_0_A/7_0	)_3EM	_ ⊘ि					
Welcome TSM Administrator			My Favorites 💽 🛛 Edit my profile 🗍 Help 🔹 Log out					
Integrated Solutions Console								
Work Items Status Settings	Policy							
View : No group filter	Policy Domains	and Client Nodes	<u>Close page</u>					
Welcome	Welcome       Policy Domains       2 -         The table shows the servers you have added to the console, and the policy domains defined for those servers. Policy domains help you to apply consistent rules for data management to groups of client nodes. Click a server name to work with its policy domains.         Getting Started       Image: Click a server name to work with its policy domains.							
Health Monitor	Select ^	Server Name \land	Policy Domains A					
Enterprise Management	0	CRETE1	STANDARD					
Policy Domains and Client Nodes	0	POLONIUM1	DOM_ITSO_UNIX, DOM_ITSO_WIN, STANDARD, dom_itso_lanfree					
Server MaPolicy Domains and Clie	ent Nodes ge 1 of 1	. Total	1: 2 Filtered: 2 Displayed: 2 Selected: 0					
Reporting								

Figure 23-69 Policy Domains and Client Nodes

2. Select the server whose client you wish to access by clicking the appropriate radio button.

Address 🕘 http://radon:8421/ibm/console	/!ut/p/_s.7_0_/	4/7_0_3EM/.cmd/ad/.ar/s	sa.T279d3130/.c/6_0_10K/.ce/7_0_3EP/.p/5_0_1C4/.d/0?PC_7_0	)_3EP_DsmLinkLabelName=4	CRETE18PC_7_0_31 🗾 🔗
Welcome TSM Administrator			My Favorites	💽 🕴 Edit my profi	le   Help   Log out
Integrated Solutions Console					
Work Items Status Settings	Policy	olicy×			<ul> <li>E</li> </ul>
View : No group filter	Policy Dom	ains and Client Nodes			<u>Close page</u>
Welcome	CRETE1 Po	licy Domains			? - 0
🗁 Tivoli Storage Manager	Policy doma with its prop	ains help you to apply perties, client nodes, c	consistent rules for data management to groups of clier option sets, client node schedules, and management da	nt nodes. Click a policy ( sses.	domain name to work
Getting Started		2 2	Select Action 💽 Go		
Health Monitor	Select 🔿	ect ^ Domain Name ^ Description ^		Backup Retention \land	Archive Retention \land
Enterprise Management	0	DOM ITSO LANFREE	policy domain for lanfree datatransfer directly to tape	30 days	365 days
Policy Domains and Client Nodes	0	DOM ITSO UNIX		30 days	365 days
Server Maintenance	0	DOM ITSO WIN		30 days	365 days
Reporting	0	STANDARD	Installed default policy domain.	30 days	365 days
	Page 1	of 1	Total: 4 Filtered: 4 Displayed: 4 Selected: 0		

Figure 23-70 Choose appropriate policy domain

3. Select the client's policy domain by checking the radio button, as shown in Figure 23-70.

Address 💩 http://radon:8421/ibm/conso	le/!	ut/p/_s.7_0_4	4/7_0_3F2/.cmd/ad/.ar/s	a.T3997f12f/.c/6_0_10M/.ce/7_0_3F5/.p/5_0_1C6/.d/2?PC_7_0	)_3F5_DsmLinkType=modify	.policy.domain.link& 🗾 🔗 G
Welcome TSM Administrator				My Favorites	🗾 🗌 Edit my profi	le   Help   Log out
Integrated Solutions Console						IEM.
Work Items Status Settings	P	olicy× Pc	olicy×			4 <b>b</b>
View : No group filter		Policy Doma	ains and Client Nodes			<u>Close page</u>
Welcome		CRETE1 Pol	icy Domains			? - 🗆
🗁 Tivoli Storage Manager		Policy doma with its prop	ins help you to apply erties, dient nodes,	consistent rules for data management to groups of clie option sets, client node schedules, and management cla	nt nodes. Click a policy asses.	domain name to work
Getting Started		*** *	/ P 1 1	Select Action 💽 Go		
Health Monitor		Select ^	Domain Name 🔿	Description ^	Backup Retention A	Archive Retention \land
Enterprise Management		0	DOM ITSO LANFREE	policy domain for lanfree datatransfer directly to tape	30 days	365 days
Policy Domains and Client Nodes		۲	DOM ITSO UNIX		30 days	365 days
Server Maintenance		0	DOM ITSO WIN		30 days	365 days
Reporting		0	STANDARD	Installed default policy domain.	30 days	365 days
		Page 1	of 1	Total: 4 Filtered: 4 Displayed: 4 Selected: 1		
		DOM_ITSO	UNIX Properties			? - O X
		Domain	Properties			
		Client N	lodes			
		▶ Option 5	Sets			
		Client N	ode Schedules			
		▶ Manage	ement Classes			
		3				

Figure 23-71 Expand Client Nodes

4. Expand the Client Nodes element of the Domain properties portlet at the bottom of the window, as shown in Figure 23-71.

DOM	OM_ITSO_UNIX Properties ? - 🗆 ×							
▶ D	▶ Domain Properties							
<b>▼</b> C	Client Nodes							
-	The dient node using the rules	s in the table of the policy o	are assigned Iomain. A die	to the policy doma nt node can be as:	ain. The server manages the signed to only one policy do	adata and operations for a client node by main.		
(	***	9 🖻 🔳 🕇	Sele	ct Action	Go			
. [	Select ^	Name 个	Type ^	Platform ^	Description ^	Web client address (URL) 🔿		
	0		Client	AIX 5.2	agent-node for crete	http://9.1.39.191:1582		
	0		Client	AIX 5.2	agent node for crete	http://9.1.39.191:1583		
	Page 1 of :	1	Total: 2	Filtered: 2 Displ	layed: 2 Selected: 0			
▶ 0	ption Sets							
▶ C	Client Node Schedules							
▶ M	lanagement (	Classes						

Figure 23-72 Select node

5. Once the node is displayed, select its radio button, as shown in Figure 23-72.

_					-				
DOM	M_ITSO_UNIX P	roperties					? - 🗆 🗙		
▶ D	Domain Properties								
▼ 0	lient Nodes								
	The client node using the rules	es in the table of the policy of	are dom	assigned to the policy domain. The ain. A client node can be assigned t	ser :o or	ver manages the only one policy dom	data and operations for a client node by ain.		
	*** **	/ 🖉 🔳 📬		Select Action	Ŧ	Go			
	Select ^	Name 🔿	Т	Export Client Node		cription ^	Web client address (URL) ^		
	۰	CRETE1	Cli	Perform a Client Action Launch Backup-archive Client Enable LAN-free Data Movement	N	e for crete	http://9.1.39.191:1582		
	0		Cli	<b>Table Actions</b> Show Filter Row Clear All Filters		e for crete	http://9.1.39.191:1583		
	Page 1 of	1		Edit Sort Clear All Sorts		elected: 1			
▶ 0	ption Sets			Collapse Table	•				
) ≬	Client Node Schedules								
▶ N	Management Classes								

Figure 23-73 Open drop-down menu

6. Scroll down the drop-down menu, select Launch Backup-archive Client... as shown in Figure 23-73, and click **Go**.



Figure 23-74 Prompt for client password

7. The login dialog box will be presented for your requested client, as can be seen in Figure 23-74. Enter the password if prompted and the Web client will be opened, as shown in Figure 23-74.



Figure 23-75 Web client launched from Administration Center

#### 23.4.11 Creating a Management Class

This subject is covered as a part of Section 23.5, "Setting up LAN-free operations" on page 254, and is also documented in the *Administrator's Guide* in the section entitled *Quick paths to creating Tivoli Storage Manager objects*.

#### 23.4.12 Creating a Policy Domain

This subject is covered as a part of Section 23.5, "Setting up LAN-free operations" on page 254 and is also documented in the *Administrator's Guide* in the section entitled *Quick paths to creating Tivoli Storage Manager objects*.

## 23.5 Setting up LAN-free operations

Setting up LAN-free operations is a complex task. This section documents the manual tasks required to achieve this. There is also a wizard available which guides you through this complex process.

#### 23.5.1 Enable LAN-free Data Movement wizard

The steps required to reach the wizard are:

- 1. Click Policy Domains and Client Nodes.
- 2. Click the Server whose policy domain you wish to administer.
- 3. Click the Domain Name you wish to use for LAN-free operations which will open the *domainname* Properties portlet.
- 4. Expand the Client Nodes element of the portlet to show a list of clients.
- 5. Select the client node for which you wish to use LAN-free data movement using the **Select** radio button.
- 6. Open the drop-down menu, scroll down to **Enable LAN-free Data Movement...** and click **Go**.

# 7. This launches the **Enable LAN-free Data Movement** wizard, as shown in Figure 23-76.



Figure 23-76 Enable LAN-free Data Movement wizard

8. Stepping through the wizard performs all the Server-side tasks to enable LAN-free data movement.

**Note:** On the final **Summary** window, as shown in Figure 23-77, the wizard shows which supplemental tasks need to be performed on the client node to complete the process.



Figure 23-77 Wizard summary

#### 23.5.2 Manually enabling LAN-free data movement

With the Administration Center, you can perform the tasks necessary to set up LAN-free data transfer between Server and Client. The phases on the Server side are as follows:

- Prepare the server for enterprise management.
- Define the Storage Agent as a server.
- Define paths to the storage devices.
- ► Set up the storage pool.
- Define the policy and point to the LAN-free storage pool.
- Create a new Management Class.
- Validate your LAN-free setup.
## 23.5.3 Prepare the server for enterprise management

To prepare the Server for enterprise management, follow these steps:

1. Click **Enterprise Management** in the Navigation Tree of the Work Items Navigation tab shown in Figure 23-78.

Address 🕘 http://radon:8421/ibm/console	/!ut/p/_s.7_0_A/7_0_VP				<u> </u>
Welcome TSM Administrator			My Favorites	Edit my profile	Help Log out
Integrated Solutions Console					
Work Items Status Settings	Enterp				< Þ 6
View : No group filter	Enterprise Manageme	nt			<u>Close page</u>
Welcome Tivoli Storage Manager Getting Started Health Monitor	The table shows all servers that you have added to the console. Use enterprise management to define serve another, which allows them to communicate and transfer data. Defined servers can be centrally managed use command routing feature. A defined server can also be configured to store another server's data using virtu A server's enterprise configuration role determines whether it can distribute or receive configuration informat				ine servers to one aged using the ing virtual volumes. nformation.
Enterprise Management	Select ^	Server Name \land	Ent	erprise Configuration Role	• ^
Storage Devices Policy Domains and Client	0	CRETE1	Not managed		
Nodes Server Maintenance	0	POLONIUM1	Not managed		
Reporting	Page 1 of 1	Total: 2 Filtered: 2	Displayed: 2 Selec	ted: 0	

Figure 23-78 Setup the Enterprise Configuration

- 2. Select the server you wish to set up enterprise configuration on.
- 3. Choose Set Up Enterprise Configuration... from the drop-down menu shown in Figure 23-79, and click Go.

Address 🕘 http://radon:8421/ibm/conso	le/!ut/p/_s.7_0_A/7_0_VP/.cmd/ad/.a	r/sa.T2e060a4f/.c/6_0_9R/.ce/7_0_VS/.p/5_0_0	C/.d/0?PC_7_0_VS_wh=action_7cd0ca4d&PC_7 💌 🔗 G
Welcome TSM Administrator		My Favorites	💌 🛛 Edit my profile 🗍 Help 🗍 Log out
Integrated Solutions Console			
Work Items Status Settings	Enterp× Enterp×		▲ ► B <sup>1</sup>
View : No group filter	Enterprise Management		<u>Close page</u>
Welcome Tivoli Storage Manager Getting Started	Enterprise Management The table shows all servers th another, which allows them to command routing feature. A d A server's enterprise configura	at you have added to the console. Use ent communicate and transfer data. Defined s efined server can also be configured to sto tion role determines whether it can distribu	erprise management to define servers to one ervers can be centrally managed using the ree another server's data using virtual volumes. Ite or receive configuration information.
Health Monitor Enterprise Management Storage Devices	+++ ++ 2 2 - 1 Select ^	Select Action Select Action Serv View Enterprise Properties Set Up Enterprise Configuration	Configuration Role
Policy Domains and Client Nodes	•	Server-to-Server Communication Settin Export Server	ngs
Reporting	Page 1 of 1	Ti Add Server Connection Modify Server Connection Remove Server Connection	<b>x</b>

Figure 23-79 Select Set Up Enterprise Configuration...

4. The **Setup Enterprise Configuration** wizard portlet will then be displayed to step you through the setup process. The first page of the wizard is shown in Figure 23-80. Click **Next** to start the wizard.



Figure 23-80 Enterprise Configuration Wizard

5. Verify the data shown in the fields in Figure 23-81 and fill in the necessary entries. Much of the setup may have already been done during the initial server setup process.

Enterprise Management		<u>Close p</u>
Set Up Enterprise Configur	ration	21
✓ Welcome → General Sharing Settings	General Enter the name and communications i server. If this server is being defined will use has already been configured.	nformation that will enable other servers to communicate with this as a managed server, ensure that the configuration manager server
Sharing Options Summary	Server name POLONIUM1 Server password ********* TCP/IP address polonium. almaden. ibm. com Select the server's enterprise configur. © None - does not distribute or receive © Configuration manager - can distri © Managed server - can receive confi	Verify password ******** TCP/IP port 1500 stion role ve configuration objects bute configuration objects to servers defined as managed servers guration objects from a server defined as a configuration manager
< Back Next > F	inish Cancel	

Figure 23-81 Enterprise Configuration Wizard - General

6. Check the summary and click **Next**. The Summary will be displayed, as shown in Figure 23-82.

Enterprise Management		Close pag
Set Up Enterprise Configu	ration	? - 0
✓ Welcome ✓ General	Summary You have successfully set up the following enterprise configuration.	
Sharing Settings Sharing Options → Summary	Server POLONIUM1 is set up to communicate with other defined servers.	
< Back Next > Fir	inish Cancel	

Figure 23-82 Enterprise Configuration Wizard - Summary

Having completed the wizard, there are a couple of checks required to complete this task.

 To check or configure server-to-server communications, select Server-to-Server Communication Settings... from the drop-down list, as shown in Figure 23-83.

Welcome TSM Administrator			My Favorites	Edit my profil	e Help Logout
tegrated Solutions Console					
Work Status Settings	Enterp× Enterp×				4 >
iew : No group filter 💌	Enterprise Management				<u>Close p</u>
Tivoli Storage Manager Getting Started	The table shows all servers the allows them to communicate server can also be configured whether it can distribute or re	at you have added to the console. Use ent and transfer data. Defined servers can be o to store another server's data using virtua ceive configuration information.	terprise managen centrally manageo I volumes. A serv	nent to define servers to d using the command ro er's enterprise configura	one another, which uting feature. A defin tion role determines
Health Monitor Enterprise Management Storage Devices Bolicy Demoise and Client	***         **         *	Select Action     Select Action     View Enterprise Properties     Set Up Enterprise Configuration     Server to:Server Communication Settl	Go Enterp	rise Configuration Role	^
Nodes Server Maintenance	•	Export Server Import Server			
Reporting	Page 1 of 1	Add Server Connection Modify Server Connection Remove Server Connection	1		

Figure 23-83 Enterprise Configuration - Server-to-Server Communication Settings

8. The Server-to-Server settings are shown, as shown in Figure 23-84. Clicking in the **Enable cross-definition** check box means that if your server is defined on another server, the other server will also be defined on yours.

Address 🕘 http://radon:8421/ibm/console/	/!ut/p/_s.7_0_A/7_0_VP/.cmd/ad/.ar/sa.T14	/2dca6a/.c/6_0_9R/.ce/7_0_V5/.r	p/5_0_DC/.d/6?PC_7_0_V5_w	<pre>wh=wh&amp;PC_7_0_V5_wa=110237685362</pre>	218PC 💌 🔗 Go
Welcome TSM Administrator			My Favorites	Edit my profile Help	Log out
Integrated Solutions Console					IBM.
Work Items Status Settings	Enterp× Enterp				< > B
View : No group filter	Enterprise Management				<u>Close page</u>
Welcome	Enterprise Management				? - 🗆
🗁 Tivoli Storage Manager	Server-to-Server Settings Enter the name and communications	information that will enable	other servers to commun	icate with this server.	
Getting Started	Server name				
Health Monitor	POLONIUM1				
Enterprise Management	Server password *******	Verify password			
Storage Devices	TCP/IP address	TCP/IP port			
Policy Domains and Client Nodes	polonium.almaden.ibm.com	1500			
Server Maintenance	Cross-definition allows another set	war to define itself to this se	mer. This can be useful w	then setting up sementa-server	
Reporting	communications in large or comple management setup, and then disa	ex networks. It is recommend able it.	d that you only enable cro	ss-definition during enterprise	
	✓ Enable cross-definition				
	OK Cancel				

Figure 23-84 Enterprise Configuration - Enable Cross Definition

9. Clicking **OK** will close the portlet.

You have now completed the first phase, **Prepare the server for enterprise** management, and can continue to the next phase, which is **Define the Storage Agent as a server**.

#### 23.5.4 Define the Storage Agent as a server

Now you can define the Storage Agent as a server on your IBM Tivoli Storage Manager server. In our case, the server is called POLONIUM1 and the Storage Agent is called SA\_CRETE.

To define the Storage Agent as a server, follow these steps:

- 1. Click **Enterprise Management** in the Navigation Tree of the Work Items Navigation tab.
- 2. Click Enterprise Management to display the page shown in Figure 23-85.

Welcome TSM Administrator			My Favorites 💽 🛛 Edit my profile 🛛 Help 🔷 Log o		
Integrated Solutions Console					
Work Items Status Settings	Enterp×			4 Þ B	
View : No group filter	Enterprise Management	Enterprise Management <u>Close pa</u>			
Walcome	Enterprise Managemen			? - 0	
Tivoli Storage Manager Getting Started Health Monitor	allows them to commun server can also be confi whether it can distribute	isate and transfer data. Defined se igured to store another server's dat e or receive configuration informatio	vers can be enterprise managemen vers can be centrally managed u a using virtual volumes. A server' n.	it to define servers to one another, which sing the command routing feature. A defined s enterprise configuration role determines	
Enterprise Management	Select ^	Server Name \land	Enterpris	e Configuration Role 🔨	
Storage Devices Policy Domains and Client	0	CRETE1	Not managed		
Nodes Server Maintenance	0	POLONIUM1	Not managed		
Reporting	Page 1 of 1	Total: 2 Filtered: 2 D	splayed: 2 Selected: 0		

Figure 23-85 Setup the Enterprise Configuration

 Click the Server name or select View Enterprise Properties from the drop-down menu to display the Servers and Server Groups Defined to servername portlet.

Address 🕘 http://radon:8421/ibm/consc	ole/!ut/p/_s.7_0_A/7_0_2CC/.c	md/ad/.ar/sa.T737eae59/.c/6_0_MV/.ce/7_0	_2CF/.p/5_0_U0/.d/0?PC_7_0_2CF_Dsm	LinkLabelName=POLONIUM18PC_7_0 💌 🔗	
Welcome TSM Administrator			My Favorites 💌	Edit my profile   Help   Log out	
Integrated Solutions Console					
Work Items Status Settings	Enterp ×				
View : No group filter	Enterprise Managemen	t		<u>Close pag</u>	
Welcome	Enterprise Managemer	ht		? = 0	
Tivoli Storage Manager Getting Started Health Monitor	The table shows all servers that you have added to the console. Use enterprise management to define servers to one anothe allows them to communicate and transfer data. Defined servers can be contrally managed using the command routing feature server can also be configured to store another server's data using virtual volumes. A server's enterprise configuration role det whether it can distribute or receive configuration information.				
Enterprise Management				(	
Storage Devices	Select ^	Server Name	Enterprise Cor	nfiguration Role ^	
Policy Domains and Client	0	CRETE1	Not managed		
Nodes Server Maintenance	0	POLONIUM1	Not managed		
Reporting	Page 1 of 1	Total: 2 Filtered: 2 Displ	ayed: 2 Selected: 0		
	Server's and Server's Coups Defined to POLONIUM1 ? – 🗆 🗙				
	Servers				
	Server Groups				

Figure 23-86 Select the server for Enterprise Configuration

- 4. Click **Servers** in the **Server and Server Groups Defined to** *servername* portlet shown in Figure 23-86.
- 5. Select **Define Server** ... from the drop-down menu shown in Figure 23-87, and click **Go**.

Address 🕘 http://radon:8421/ibm/console	/!ut/p/_s.7_0_A/7_0_2CC/.cm	d/ad/.ar/sa.T38d36e43/.c/6_0_MV/.ce/7	_0_2CQ/.p/5_0_U3/.d/1?P	C_7_0_2CQ_wti=T38d36e43&time	estamp=10085d307e 💌 🤗
Welcome TSM Administrator			My Favor	ites 🔽 Edit my prof	ile Help Log out
Integrated Solutions Console					
Work Items Status Settings	Enterp×				
View : No group filter	Enterprise Management				<u>Close pag</u>
Welcome	Enterprise Management				? - 0
🗁 Tivoli Storage Manager	The table shows all serve allows them to communic server can also be config	ers that you have added to the con cate and transfer data. Defined ser ured to store another server's data	ole. Use enterprise ma vers can be centrally m using virtual volumes.	anagement to define servers t anaged using the command re A server's enterprise configur	o one another, which outing feature. A defined ation role determines
Getting Started	whether it can distribute (	or receive configuration information	•		
Health Monitor	# # 2 2 1	Select Action	T	Go	
Enterprise Management	Select ^	Server Name 🔿		Enterprise Configuration Role	^
Storage Devices	0		Not managed		
Policy Domains and Client	~	CRETE1			
Server Maintenance	0	POLONIUMI	Not managed		
Reporting	Page 1 of 1	Total: 2 Filtered: 2 Di:	played: 2 Selected: 0		
	<u>_</u>				
	Servers and Server Group	ps Defined to POLONIUM1			? - 🗆 ×
	▼ Servers				
	The table shows serv this server is acting a feature. A defined se	ers and storage agents that have as a configuration manager. Server erver can also be configured to stor	een defined to this se s listed in the table can a another defined serve	rver. The table also identifies be centrally managed using t ar's data using virtual volumes	any servers for which the command routing 5.
	+ 4 I e	T T Select Action	<b>.</b> Go		
	Select ^ Ser	ver Name   Define Server	iption ^	Created On \land	Created By 🔿
	O CRETE	1 Modify Server Definiti	on 1:	1/24/04 2:52:48 PM PST	GERD
	Page 1 of 1	Table Actions Show Filter Row	d: 1 Selected	d: 0	
	Server Groups	Clear All Filters Edit Sort Clear All Sorts			

Figure 23-87 Show all defined servers and select Define Servers

6. The **Define Server** wizard portlet will then be displayed to step you through the setup process to define the Storage Agent as a server. The first page of the wizard is shown in Figure 23-88.



Figure 23-88 Define Server Wizard introduction

7. Click **Next** to start the Wizard and the page shown in Figure 23-89 will be displayed.

Address 😹 http://radon:8421/ibm/console	e/!ut/p/_s.7_0_A/7_0_2CC/.cmd	/ad/.ar/sa.T7e43ee43/.c/6_0_MV/.ce/7_0_2CQ/.p	/5_0_U3/.d/3?PC_7_0	_2CQ_wh=	=wh&PC_7_0_2CQ_w	a=wa&PC_	7_0_ 🖉
Welcome TSM Administrator			My Favorites	•	Edit my profile	Help	Log out
Integrated Solutions Console							TBM.
Work Items Status Settings	Enterp ×						< > B
View : No group filter	Enterprise Management						Close page
Welcome	Enterprise Management						280
🗁Tivoli Storage Manager	Define a Server						? - 🗆 ×
Getting Started Health Monitor Enterprise Management Storage Devices Policy Domains and Client Nodes Server Maintenance Reporting	✓ Welcome General Communications Virtual Volumes Summary  < Back Next > []	General         Enter the server name and an optional de         *Server name         SA_CRETE         *Server password         ****         Description         Storage-Agent Crete         Enable the server being defined to initial	escription.	ns with PO	olonium1		

Figure 23-89 Define Server Wizard - General

8. Enter the **Server name** and **Server password** for the Storage Agent in the appropriate fields. Confirm the password in the **Verify password** field. You can also enter a description of your choice.



Figure 23-90 Define Server Wizard - Communications

 The next step in the wizard shown in Figure 23-90 requires you to enter the Communications parameters TCP/IP address and TCP/IP port. These ports must match the defined TCP/IP address and port defined on the Storage Agent.



Figure 23-91 Define Server Wizard - Virtual Volumes

10. Do not mark the check box **Configure this server to store data for server SERVERNAME using virtual volumes** shown in the Figure 23-91. The Storage Agent cannot perform this function.



Figure 23-92 Define Server Wizard - Summary

11. The Summary Pane shows that the wizard has successfully set up a server definition, as shown in Figure 23-92. Click **Next** to complete the definition of the new Server.

The phase, **Define the Storage Agent as a server**, has now been completed. The next phase is **Define the drive paths to the Storage Agent**.

## 23.5.5 Define paths to the storage devices

In order to define the paths for the storage devices in your LAN-free environment follow these steps:

- 1. Click Storage Devices to display the Libraries for All Servers portlet.
- 2. Click in the **Select** radio button to select the library you wish to add the drive paths to.
- 3. Select **Modify Library** from the drop-down menu as displayed in Figure 23-93, and click **Go**.

Address 🕘 http://radon:8421/ibm/consol	e/!ut/p/_s.7_0_A/7_0_2D6/.cmd/ad/.ar/s	a.T4a376e35/.c/6_0_N2/.ce/7_0_2DB/.p/5	5_0_UA/.d/1?PC_7_0_2DB_DsmLir	nkType=libraryPropLinkInvoked.POL 💌 🔗
Welcome TSM Administrator			My Favorites 💌	Edit my profile   Help   Log out
Integrated Solutions Console				
Work Items Status Settings	Storag×			◄ ► 0
View : No group filter 💽	Storage Devices			Close pag
Welcome	Servers			2-0
🗁 Tivoli Storage Manager	Select a server and use the table that have been added to the cons	action list to work with its storage po- sole.	ols, device classes, and data	movers. The table shows all servers
Getting Started	** * ø ø e = =	Select Action	Go	
Health Monitor	Select ^ Server Name	Storage Pool Count ^	Device Class Count 4	Data Mover Count 🔿
Enterprise Management	o 🔳	5	2	
Storage Devices				
Policy Domains and Client Nodes	O POLONIUM1	8	5	•
Server Maintenance	Page 1 of 1	Total: 2 Filtered: 2 Displayed: 2	Selected: 0	
Reporting				
	Libraries for All Servers			? - 0
	A server uses storage devices to a shows libraries for all servers that table action to create the library a its drives.	store data for client nodes. Libraries : have been added to the console. Th ind its drives, create a storage pool,	and drives represent storage here are two ways to add a lib and add media. Use Create .	devices to the server. The table rary. Use the Add a Storage Device a Library to create only the library and
	🕂 😤 🖉 🗖 🖶	Select Action 💽 Go		
	Select ^ Library Name ^	Status ^ Library Manager ^	Library Clients ^ Scratch	Volumes ^ Private Volumes ^
	• TSMLIB01	Notmal POLONIUM1 -	- 3	5
	Page 1 of 1	Total: 1 Filtered: 1 Displayed: 1	Selected: 1	
	This portlet will refresh in 4 minut	es and 48 seconds.		

Figure 23-93 Modify Library drop-down selected

4. In the Library properties portlet, click the **Drive Paths** tab to open the portlet, as shown in Figure 23-94.

TSMLIB01 Properties (POL	ONIUM1)	? - 🗆 🗙
General	General	
<u>Drives</u>	after it has been defined.	evice that contains drives, you cannot change a library name or type
Library Paths	Name	Library type
Drive Paths	TSMLIB01	SCSI
<u>Volumes</u> <u>Cleaning Cartridges</u>	World wide name	Serial number O Automatically detect the serial number when the library's path is defined. © Use the following serial number IBM7801954
	Automatically label volumes O Yes ⓒ No O Yes, and overwrite existing	g volume labels
	Last Updated By ADMIN	Last Updated On 11/22/04 4:56:06 PM PST
	🗖 Share this library	
OK Apply Cancel		

Figure 23-94 Library properties portlet

Choose **Add Path ...** from the drop-down menu illustrated in Figure 23-95 and click **Go**.

TSMLIB01 Properties (POLC	DNIUM1)				? - 🗆
<u>General</u> Drives	Drive Paths The table shows paths that have server, storage agent, or data mo	been defined for the over, to access the c	e drive. A drive pa drive.	th allows a source, s	such as a
<u>Library Paths</u> Drive Paths	** * 2 2 = =	Add Path	<b>.</b> Go		
Volumes	Select ^ Source Name ^	Source Type 🔿	Drive Name \land	Device Name \land	Online 🔿
Cleaning Cartridges	O POLONIUM1	SERVER	DRIVE01	mt0.2.0.4	~
	O POLONIUM1	SERVER	DRIVE02	mt0.4.0.4	~
	Page 1 of 1	Total: 2 Filtered:	2 Displayed: 2	Selected: 0	
				5	
OK Apply Cancel					

Figure 23-95 Add path drop-down menu

5. Enter the Path details, device name, or special file of the device as it is known to the Storage Agent, as shown in Figure 23-96. The drive name must represent the drive the device name points to. The Source name is the name of the Storage Agent you have already defined.

TSMLIB01 Properties (POLONIUM1)	? - 🗆 🗙
Add Drive Path	
Enter a device name or special file for the drive, as it is known to the source. A source is a server, storage agent, or data mover that will use the drive.	_
*Device name or special file /dev/rmt0	
Drive name DRIVE01	
Source name	
OK Cancel	

Figure 23-96 Enter path details

6. Check your input; the path must be online. Note the check indicating this in the **Online** column shown in Figure 23-97.

TSMLIB01 Properties (POLO	ONIUM1)				?==x
<u>General</u> Drives	Drive Paths The table shows paths the server, storage agent, o	hat have been defined for t r data mover, to access the	he drive. A drive pa drive.	th allows a source, s	uch as a
Library Paths Drive Paths Volumes Clossing Cartridage		ne operation completed suc	cessfully.		
<u>Cleaning Cartridges</u>	# # 2	👕 👕 📔 Select Actio	on 🔽 Go		
	Select ^ Source I	Name ^ Source Type ^	Drive Name 🔿	Device Name 🔿	Online 🔿
	O POLONIU	IM1 SERVER	DRIVE01	mt0.2.0.4	~
	O POLONIU	IM1 SERVER	DRIVE02	mt0.4.0.4	~
	O SA_CRET	E SERVER	DRIVE01	/dev/rmt0	~
	Page 1 of 1	Total: 3 Filtered	l: 3 Displayed: 3	Selected: 0	
OK Apply Cancel					

Figure 23-97 Path successfully added

You have successfully completed the **Define paths to the storage devices** phase. The next step in your task is to define a storage pool with a LAN-free capable device class.

# 23.5.6 Set up the storage pool

To create an additional storage pool, you use the **Create a Storage Pool** wizard. To launch this wizard, follow these steps:

- 1. Click Storage Devices in the Work Items List.
- 2. Click the **Select** radio button for the server you wish to add the storage pool to.
- 3. Choose View Storage Pools ... from the drop-down menu, as shown in Figure 23-98, and click Go.

Address 🙆 http://radon:8421/ibm/console	/!ut/p/.cmd/PortletClose/.c/6_0_N4/.ce/	7_0_2DU/_s.7_0_A/7_0_2DM#7_0_2DU			•
Welcome TSM Administrator			My Favorites	Edit my profi	le   Help   Log out
Integrated Solutions Console					III III SA IEM
Work Status Settings	Policy、× Storag、×				
View : No group filter	Storage Devices				Close pac
Welcome	Servers		alla device deserve		2 - 0
🗁Tivoli Storage Manager	that have been added to the con	sole.	ools, device classes,	and data movers. The	cable shows all servers
Getting Started Health Monitor Enterprise Management	Image: Select ^     Server Name	Select Action      Select Action     View Storage Pools     View Device Classes	Go Device Class	s Count ^ Da	ita Mover Count 🔿
Storage Devices Policy Domains and Client Nodes	O <u>CRETE1</u> O POLONIUM1	View Collocation Groups View Data Movers View Volume History	5	-	
Server Maintenance Reporting	Page 1 of 1	Back Up Device Configuration	Selected: 1		
	Libraries for All Servers				? - 0
	A server uses storage devices to shows libraries for all servers tha table action to create the library its drives.	store data for dient nodes. Libraries t have been added to the console. T and its drives, create a storage pool	and drives represen here are two ways to , and add media. Us	t storage devices to the add a library. Use the e Create a Library to cre	e server. The table Add a Storage Device eate only the library and
	# # 2 2 1 1	Select Action 💽 Go			
	Select ^ Library Name ^	Status ^ Library Manager ^	Library Clients \land	Scratch Volumes \land	Private Volumes \land
	O <u>TSMLIB01</u>	Normal POLONIUM1	-	з	5
	Page 1 of 1	Total: 1 Filtered: 1 Displayed: 1	L Selected: 0		
	This portlet will refresh in 4 minu	tes and 54 seconds.			

Figure 23-98 View Storage Pools drop-down

4. You see a list of all defined storage pools, as shown in Figure 23-99. Choose **Create a Storage Pool...**from the drop-down menu and click **Go**.

Storage Pool:	s for POLONIUM1				? - 🗆 ×
A storage poo	l represents a colle	ction of storage volum	es of the same media type. Storage	e pools are used to designa	ite where all
manageu uat	a will be scored. Too	i cannot backup a cop	y storage poor or restore copy storag	je poor volumes.	
( <u>+++</u> + <b>+</b> ₽ (	1 🖻 🔳 🖀	Select Action	🗾 Go		
Select ^	Name 🔿	Select Action Create a Storage Poo	mated Capacity (MB) \land	Percent Utilized	Next ^
0	ARCHIVELTO	Modify Storage Pool. Delete Storage Pool		0.0	
0	ARCHIVEPOOL	Add a Storage Device View Collocation Grou	2 	0.0	ARCHIVELTO
0	BACKUPLTO	Back Up Storage Poo Restore Volumes	l ▼	0.0	
0	BACKUPPOOL	DISK	8 G	95.0	BACKUPLTO
0	DIRMC COPY	LTOCLO	0.0 M	0.0	
0	DIRMC DISK	DISK	16.0 M	0.0	DIRMC_TAPE
0	DIRMC TAPE	LTOCLO	0.0 M	0.0	
0	NEWSTG	DISK	100.0 M	0.0	
0	OFFSITEPOOL	LTOCLO	0.0 M	0.0	
Page 1 o	f 1	Total: 9 Filtered: 9	Displayed: 9 Selected: 0		

Figure 23-99 Create a Storage Pool drop-down

5. Enter a storage pool name and a description of your choice, as shown in Figure 23-100. Choose the type of storage pool using the radio buttons. For LAN-free data transfer, you can only use a *primary sequential access* storage pool, so that option should be selected. Click **Next** to continue.

Create a Storage Pool	2-0×
→ General Specify storage pool settings Summary	General Storage Pool Settings A storage pool represents a collection of storage volumes of the same media type. A storage volume represents the basic unit of storage, such as a tape cartridge or allocated disk space. Storage pools are used to designate where all managed data will be stored. After you define a storage pool, you cannot change its type.
	*Storage pool name backuplanfree
	Storage pool description g-Pool to LTO-Tape
	Select the type of storage pool you want to create Primary, sequential access - stores data from client nodes and data migrated from other storage pools. Uses tape or optical media, or sequential-access disk (FILE or SERVER device class type) Primary, random access - stores client node data on random-access disk (DISK device class name) Copy - stores backup copies of primary storage pools. Uses tape or optical media, or sequential-access
	disk (FILE or SERVER device class type)
< Back Next > Fi	inish Cancel

Figure 23-100 Choose Storage pool name and type

6. Select a Device class from the Device class name drop-down list shown in Figure 23-101. Ensure that this device class has LAN-free capability. Enter a value for Maximum number of scratch volumes. Notice that there is the option to define a Next storage pool, but this would be inappropriate in this situation. Click Next to continue.



Figure 23-101 Select a Device Class

7. Click **Next** to display the summary page of the Create a Storage Pool wizard, as shown in Figure 23-102.

Create a Storage Pool	? - 🗆 ×
✓ General → Specify storage pool	Summary You have successfully created the following storage pool:
✓ settings → Summary	Storage Pool Name: BACKUPLANFREE Storage Pool Type: Primary, sequential access Device Class Name: LTOCLO Maximum Number of Scratch Volumes: 4
< Back Next > Fi	nish Cancel

Figure 23-102 Successful completion of wizard

8. Clicking Finish will close the Summary page of the wizard.

You have successfully created a new storage pool for your LAN-free backups, but this storage pool has no integrity checking, so you should enable CRC checking. The next steps will achieve this:

9. In the Storage Devices portlet, you should still be able to see the Server you have been modifying. Ensure that it is still selected by using the Select radio button, and choose **View Storage Pools...** from the drop-down menu.

10. To update the LAN-free storage pool, select the storage pool using the **Select** radio button, open the drop-down menu shown in Figure 23-103, select **Modify Storage Pool...** and click **Go**, or click the storage pool shortcut.



Figure 23-103 Modify Storage Pool

11. Click the **Advanced options** tab of the *storage pool* properties (*servername*) and activate CRC checking for this storage pool by clicking the check box, **Enable data validation using a cyclic redundancy check**, as shown in Figure 23-104.



Figure 23-104 Enable CRC checking for Storage Pool

You have now completed the **Set Up the storage pool** phase. The next phase is **Define the LAN-free policy**.

## 23.5.7 Define the LAN-free policy

The next phase in your task is to define storage policies with a management class that points to the LAN-free storage pool.

To create an additional storage pool, you use the **Create a Storage Pool** wizard and follow these steps:

- 1. Click Policy Domains and Client Nodes in the Work Item List.
- 2. Select View Policy Domains in the drop-down list and click Go.

3. Select **Create a Policy Domain...** from the drop-down menu, as shown in Figure 23-105, and click **Go**.

Address 🕘 http://radon:8421/ibm/console/!ut/p/_s.7_0_A/7_0_2DG/.cmd/ad/.ar/sa.T2d166e04/.c/6_0_N3/.ce/7_0_2DJ/.p/5_0_UD/.d/0?PC_7_0_2DJ_DsmLinkLabelName=POLONIUM18PC_7_0 🗾 🔗 G					
Welcome TSM Administrator				My Favorites 🗾 🛛 Edit n	ny profile   Help   Log out
Integrated Solutions Console					
Work Items Status Settings	Policy× Polic	zy×			
View : No group filter 🔍	Policy Domain	s and Client Nodes			<u>Close page</u>
Welcome Privoli Storage Manager Getting Started	POLONIUM1 Policy domain with its proper	Policy Domains s help you to apply cons ties, client nodes, optio	sistent rules for data management n sets, client node schedules, and i	to groups of client nodes. Click a management classes.	policy domain name to work
Health Monitor	Select ^	Domain Name ^	Description ^	Backup Retention 🔿	Archive Retention
Enterprise Management	0	DOM ITSO UNIX		30 days	365 days
Policy Domains and Client Nodes	0	DOM ITSO WIN		30 days	365 days
Server Maintenance	0		Installed default policy domain.	30 days	365 days
Reporting	Page 1 of 1 Total: 3 Filtered: 3 Displayed: 3 Selected: 0				

Figure 23-105 Define Policy Domain

4. The wizard should now be displayed. The first page of the wizard is shown in Figure 23-106.

Create Policy Domain	
→ General Storage pools Assign dient n <u>odes</u>	<b>General</b> Policy domains help you to apply consistent data management rules to multiple client nodes. Set rules for retaining backup and archived files if an appropriate management class is unavailable or does not exist. These retention settings protect files from being immediately expired.
Summary	*Name         dom_itso_lanfree         Description         policy domain for lanfree datatransfer directly to tape         Backup retention         30       days         Archive retention         365       days
< Back Next >	Finish Cancel

Figure 23-106 Define Policy Domain Wizard

- 5. Enter a policy domain name and a description of your choice. Enter **Backup retention** and **Archive retention** values. In most cases the default values should suffice.
- Choose your LAN-free storagepool either Storage pool for backup data or Storage pool for archive data or both from the drop-down lists, as shown in Figure 23-107.

Create Policy Domain	2-0
<ul> <li>✓ General</li> <li>→ Storage pools</li> <li>Assign client nodes</li> </ul>	Storage Pools Storage pools determine where managed data will be stored. The same storage pool can be selected for both backup and archived data, but different pools are typically used. You must select a storage pool for at least one of these data types.
Summary	Storage pool for backup data BACKUPLANFREE Storage pool for archive data Select Storage Pool
< Back Next > F	inish Cancel

Figure 23-107 Define Policy Domain Wizard - Storage pools

7. Select the **Yes** radio button to assign clients to the policy domain immediately, as shown in Figure 23-108.

Create Policy Domain	2 - 0
<ul> <li>✓ General</li> <li>✓ Storage pools</li> <li>→ Assign client nodes</li> </ul>	Assign Client Nodes Now? The server manages the data and operations for a client node by using the rules of the policy domain. You can select the client nodes to assign to the new policy domain now or at another time. A client node can be assigned to only one policy domain.
Summary	Do you want to assign client nodes to this policy domain now? Yes         No
< Back Next > F	nish Cancel

Figure 23-108 Define Policy Domain Wizard - Assign client nodes

8. When assigning client nodes that use the Storage Agent, you can **View all** client nodes or use the search facility in the **View client nodes that match your conditions** radio button. This field supports wildcards, as shown in Figure 23-109.

Create Policy Domain	2=0
✓ General ✓ Storage pools	Assign client nodes Create the list of client nodes to select from.
→ Assign client nodes Summary	<ul> <li>○ View all client nodes.</li> <li>O View client nodes that match your conditions:</li> <li>Name</li></ul>
	< Back Next > Finish Cancel

Figure 23-109 Define Policy Domain Wizard - View client nodes

9. You are then presented with a list of all clients that match your wildcard definition as displayed in Figure 23-110. Select the node you wish to add to the policy domain using the check box and click **Next**.

Create Policy Domain								? = 1
✓ General ✓ Storage pools → Assign client nodes	Assign client	nodes to as	sign to the policy	domain. A die	ent node be ction	elongs to a	only o	ne policy domain.
Summary	Select ^	Name ^ CRETE	Current Policy DOM_ITSO_UNI	Domain ^ X	Type ^ Client	Platform AIX	n ^	Description ^ its0-team aix-client
	Page 1	CRETE2	DOM_ITSO_UNI: Total: 3	X Filtered: 3 D	Client isplayed: 3	AIX Selecter	d: 1	agent node for crete
	< Back	Next >	Finish Cancel					

Figure 23-110 Define Policy Domain Wizard - Select client nodes

10. In the Summary you will be provided with an overview of all definitions created, as shown in Figure 23-111. Confirm and close by clicking the **Finish** button.

Create Policy Domain	2 – 🗆
<ul> <li>✓ General</li> <li>✓ Storage pools</li> <li>✓ Assign client nodes</li> </ul>	Summary You have successfully created a policy domain named dom_itso_lanfree. You can assign additional client nodes to the policy domain later. You can also create custom policies for the policy domain by defining management classes, schedules, and option sets.
→ Summary	Policy domain name: dom_itso_lanfree Description: policy domain for lanfree datatransfer directly to tape Backup Retention: 30 Archive Retention: 365 Storage pool for backup data: BACKUPLANFREE Storage pool for archive data: Not defined. Client Nodes: CRETE
< Back Next > F	inish Cancel

Figure 23-111 Define Policy Domain Wizard - Summary

You have now successfully defined a new policy domain and assigned nodes to it. You have also created a management class with the name *standard*, as well as standard attributes for backup, archive, and space management.

This management class is assigned as the default management class. You can decide whether to use this as the default, or define a new management class with different values.

## 23.5.8 Create a new management class

You define a new management class by using the **Create Management Class** wizard as detailed in the following steps:

- 1. From the **Policy Domains** portlet opened during the previous phase, select the policy domain you wish to add the Management Class to.
- 2. Choose **Management Classes** from the **Policy Domains Properties** portlet by clicking the expansion icon shown at the bottom of Figure 23-112.

Address 🕘 http://radon:8421/ibm/conso	ile/!ut	t/p/_s.7_0_A	4/7_0_2E3/.cmd/ad/.ar/s	a.T37c6ae25/.c/6_0_N5/.ce/7_0_2E6/.p/5_0_UL/.d/6?PC_7_0_2	2E6_wti=T37c6ae25&PC_7_	0_2E6_DsmLinkType 🗾 🔗		
Welcome TSM Administrator				My Favorites	Edit my prof	ile   Help   Log out		
Integrated Solutions Console						ik 👬 IBM.		
Work Items Status Settings	Pol	licy× Po	olicy、× Storag、×			< > B		
View : No group filter	P	Policy Domains and Client Nodes						
Welcome	P	POLONIUM1 Policy Domains						
	P	olicy doma	ins help you to apply erties, client podes, c	consistent rules for data management to groups of die	nt nodes. Click a policy	domain name to work		
			ercres) ellene hodes) e	plan seas dient node schedales, and management at				
Getting started		***	22 🖻 🗎	Select Action 💽 Go				
Health Monitor	1	Select ^	Domain Name \land	Description ^	Backup Retention \land	Archive Retention ^		
Enterprise Management		0	DOM ITSO LANFREE	policy domain for lanfree datatransfer directly to tape	30 days	365 days		
Policy Domains and Client Nodes		0	DOM ITSO UNIX		30 days	365 days		
Server Maintenance		0	DOM ITSO WIN		30 days	365 days		
Reporting		0	STANDARD	Installed default policy domain.	30 days	365 days		
		Page 1	of 1	Total: 4 Filtered: 4 Displayed: 4 Selected: 0				
		DOM_ITSO Domain Client N Option S Client N Manage	LANFREE Properties Properties lodes Sets lode Schedules ement Classes			? - ¤×		

Figure 23-112 Policy Domains Properties - Define a new Management Class

3. Choose **Create Management Class...** from the drop-down menu and click **Go**, as shown in Figure 23-113.

DOM_ITSO	LANFREE Prop	erties		? = 🗆 🗙			
Domain	Properties						
▶ Client Nodes							
Option 3	Option Sets						
Client N	Client Node Schedules						
🔻 Manage	ment Classe	s					
A mana domain manage client no	gement class must have at ment class is ode's options f	contains the policy that least one managemen used for all dient node file to bind individual fil-	specifies where dient noc t dass, which is used as t data unless files or direct es and directories to a ma nagement Class	le data will be stored, and how it will be managed. A policy he default for all client nodes in the domain. The default tories are bound to a different management class. Use a anagement class.			
s	elect ^	Name ^	Default ^	Description ^			
	0		~	Standard management class			
Pag	Page 1 of 1 Total: 1 Filtered: 1 Displayed: 1 Selected: 0						

Figure 23-113 Create a Management Class drop-down

4. The Create Management Class wizard appears, as shown in Figure 23-114. Enter a **Name** for your new management class and a **Description** in the appropriate fields. If the description spreads across several lines, you can use the up and down buttons to scroll this field. Click **Next** to continue.

Create Management Cl	ass PEC
→ General Backup settings Archive settings	General A management class contains the rules used to manage data for client nodes in the domain. *Name [mc_fs_lanfree
Summary	Description Mgmt-Class for Lanfree-Clients, which points directly to the san-attached tapes
< Back Next >	Finish Cancel

Figure 23-114 Create Management Class Wizard

5. The wizard then provides you with the **Backup Settings** page, shown in Figure 23-115, to enter the appropriate values. From the pull-down menu, you can select the destination storage pool for LAN-free data transfer. Click **Next** to continue.



Figure 23-115 Create Management Class Wizard - Backup settings

6. The **Backup Versions** page, shown in Figure 23-116, provides you with the ability to control how many versions of a *backup* file to keep in storage, and how to manage versions for files deleted from their original location on the node. Click **Next** to continue the wizard.



Figure 23-116 Create Management Class Wizard - Backup versions

 You enter the appropriate *archive* settings in the **Archive Settings** page of the wizard. From the drop-down menu select the destination storage pool for your LAN-free archives, as shown in Figure 23-117. Once the settings are entered, click **Next** to continue.



Figure 23-117 Create Management Class Wizard - Archive settings

8. You can also enter the settings for space management, if the HSM component is installed and activated on your IBM Tivoli Storage Manager Clients, and IBM Tivoli Storage Manager for Space Management is licensed. This page is shown in Figure 23-118. Click **Next** to display the Summary Page of the wizard.

Create Management Class	?-=×
<ul> <li>✓ General</li> <li>✓ Backup settings</li> <li>✓ Archive settings</li> <li>→ HSM settings Summary</li> </ul>	HSM Settings Hierarchical storage management (HSM) functions allow data to be migrated from client nodes to a storage pool, and back again when needed. HSM, also known as space management, is available for client nodes on some operating systems. Where to store files (Consider using disk storage to initially store client node data. You can later migrate the data to a different form of storage.) Select Storage Pool ↓ How are files selected for migration from the client node? •• Files cannot be migrated (no HSM is allowed for files with this management class) •• Files can only be selected manually Files are selected automatically, and can also be selected manually Files become eligible for automatic migration after a period of not being accessed on the client node. •• Days since last access •• Files must be backed up before being migrated to a storage pool
< Back Next > Fit	nish Cancel

Figure 23-118 Create Management Class Wizard - HSM Settings

9. On the **Summary** page, shown below in Figure 23-119, you are provided with an overview of all the settings you have entered. To confirm and close the wizard, click the **Finish** button.



Figure 23-119 Create Management Class Wizard - Summary

You have successfully finished the steps required to define a new management class. Your final phase in the process is **Validating your LAN-free setup**.
### 23.5.9 Validating your LAN-free setup

To confirm that the LAN-free capability is working, there is a new Tivoli Storage Manager Version 5.3 command:

validate lanfree

The first result of this command may look like Figure 23-120.

```
tsm: POLONIUM1>
 sm: POLONIUM1>validate lanfree crete sa_crete
ANR0387I Evaluating node CRETE using storage agent SA_CRETE for LAN-free data
movement.
       Storage Operation Mgmt Class Destination LAN-Free Explanation
Node
Name
       Agent
                                                         capable?
                             Name
                                          Name
CRETE SA_CRETE BACKUP
                             STANDARD
                                          BACKUPLANFR- No
                                                                     Library not set to
SHARED=YES for
                                           EE
                                                                      destination storage
                                                                      pool.
ANR1706I Ping for server 'SA_CRETE' was able to establish a connection.
ANR0388I Node CRETE using storage agent SA_CRETE has 0 storage pools capable of
LAN-free data movement and 1 storage pools not capable of LAN-free data
movement.
tsm: POLONIUM1>
```

Figure 23-120 Validate LAN-free configuration with command

The result shows an error. In this case the Library is not LAN-free enabled because it was not defined with shared=yes.

In order to enable LAN-free capability on your Tivoli Storage Manager Server, follow these steps:

- 1. Open the Storage Devices portlet by clicking it in the Navigation Tab.
- 2. Click your library to view the *libraryname* Properties portlet.
- 3. In the General tab, ensure that the check box **Share this Library** is checked, as shown in Figure 23-121, then click **Apply** and **OK**.
- 4. You have successfully enabled the LAN-free capability for your library.

TSMLIB01 Properties (POL	ONIUM1)	? - 🗆 🗙
General	General	
<u>Drives</u>	A library represents a storage d after it has been defined.	evice that contains drives. You cannot change a library name or type
Library Paths	Name	Library type
Drive Paths	ISMLIBUI	SCSI
Volumes	World wide name	Serial number
<u>Cleaning Cartridges</u>		$\mathrm C$ Automatically detect the serial number when the library's path is defined.
		• Use the following serial number
		IBM7801954
	Automatically label volumes C Yes © No C Yes, and overwrite existing	g volume labels
	Last Updated By	Last Updated On
	Share this library	TT 25 04 4120100 MM 621
OK Apply Cancel		

Figure 23-121 Library Properties - enable library sharing

If you check your definitions again, by entering the command **validate lanfree**, you should see the following successful output, as shown in Figure 23-122.

tsm: ) ANRØ31 movem	POLONIUM1: 871 Evalua ent.	>validate ∷ ating node	lanfree cret CRETE using	te sa_crete y storage age	nt SA_CRET	E for LAN-free data
Node Name	Storage Agent	Operation	Mgmt Class Name	Destination Name	LAN-Free capable?	Explanation
CRETE	SA_CRETE	BACKUP	MC_FS_LAN- FREE	BACKUPLANFR- EE	Yes	
CRETE	SA_CRETE	BACKUP	STANDARD	BACKUPPOOL	No	Destination storage pool is DISK.
CRETE	SA_CRETE	ARCHIVE	MC_FS_LAN- FREE	ARCHIVELANF- REE	Yes	-
CRETE	SA_CRETE	ARCHIVE	STANDARD	ARCHIVEPOOL	No	Destination storage pool is DISK.
ANR17 ANRØ3 LAN-fi movem	061 Ping 8 881 Node ( ree data n ent.	for server CRETE using novement a	'SA_CRETE' g storage ag nd 2 storage	was able to o gent SA_CRETE gools not co	establish a has 2 stor apable of 1	a connection. rage pools capable of LAN-free data

Figure 23-122 Validate LAN-free after activation of library sharing

In our example, only management class MC\_FS\_LANFREE can perform a LAN-free backup or archive. To use this Management class you can either assign it as the default or insert an appropriate include statement in the client's option file, as shown in Figure 23-1.

Example 23-1 Select a Management class - include/exclude statement in dsm.opt

include \*:/.../\* MC\_FS\_LANFREE

### 23.5.10 Enabling Health Monitoring

Health Monitoring depends on the Tivoli Storage Manager Server Administrator account ADMIN\_CENTER. This account is locked by default and needs to be unlocked and enabled to ensure that Health Monitoring works.

**Important:** The ADMIN\_CENTER account should be administered by only one Tivoli Storage Manager administrator. Using multiple Administration Center users allows the ADMIN\_CENTER password to be changed by any of those users. Ensure that the password is known to all of your Administrators so that it does not become locked. Ensure that the ADMIN\_CENTER account is enabled by checking the Administrator account:

1. Open a view of your IBM Tivoli Storage Manager server that allows the use of the drop-down menu option **Server Properties**, as shown in Figure 23-123.

	Enterprise Management					2 - 1
Welcome	The table shows all servers tha allows them to communicate an server can also be configured t whether it can distribute or rece	t you have add nd transfer dat o store anothe sive configuratio	led to the console a. Defined server: r server's data us on information.	a. Use e s can be ing virtu	nterprise management f centrally managed usin Jal volumes. A server's e	to define servers to one another, which ig the command routing feature. A define interprise configuration role determines
Health Monitor		Server Prop	perties		Go	
Enterprise Management	Select ^	Server Nan	ne ^		Enterprise (	Configuration Role
Storage Devices	۲			Not mai	naged	
Policy Domains and Client Nodes		POLONIL	JM1			
Server Maintenance	Page 1 of 1	Total: 1 F	filtered: 1 Displa	iyed: 1	Selected: 1	
Reporting	POLONIUM1 Server Properties					2 - 01
	General	dministrators				
	Server Processes	he table shows	administrators re	egistere	d to the server.	
	Client Node Sessions	BB	*** *2 8 8		Select Action on	
	Activity Log				Authority Louis A	
	Communications	Select	ADMIN		Authority Level	<1
	Event Logging		ADMIN CENTER		System	<1
	Security		ARMIN		System	6
	Administrators		CRETE		Client Owner	<1
	Database and Log		CRETE1		Client Owner	<1
	Scripts		CRETE2		Client Owner	<1
	Administrative Schedules		GERD		System	<1
	License		POLONIUM		Client Access	2
			RESIRT4		Client Owner	1
			RESIRT4A		Client Owner	1
			SERVER_CONSO	LE	System	
			SHAYNE		System	6
		Page 1 o	f 1	Total:	12 Filtered: 12 Displa	ayed: 12 Selected: 1
				_		
	OK Apply Cancel					

Figure 23-123 Server Properties view showing Administrators

- 2. In the Server Properties portlet, select Administrators.
- 3. Check the check box adjacent to the ADMIN\_CENTER account and select the **Modify Administrator** from the drop-down menu.
- 4. Update the password if necessary and ensure that the **Lock** check box is NOT checked, as shown in Figure 23-124.

POLONIUM1 Server Properties	? - 🗆 🗙
Modify an Administrator	
An administrator's authority level restricts temporarily prevent access to the server.	the types of server tasks that can be performed. You can lock an administrator to
Name	Contact information
ADMIN_CENTER	Administration Center
Password ( 6 character minimum)	Verify password
Password expiration O Server expiration period - 186 days	
Never	Force password reset
C Expire the password in	
Administrator authority level	
🗹 System - performs all administrative	e tasks
🗖 Storage - manages server storage f	or the following storage pools
All storage pools All ARCHIVELTO	
🔲 Policy - manages operations for clie	nt nodes in the following policy domains
All policy domains 🛋 DOM_ITSO_UNIX 💽	
Coperator - controls server operation	s and storage volumes
Analyst - manages server statistics	
OK Cancel	

Figure 23-124 Ensure account is not locked

Enabling Health Monitoring:

- 1. Open the Administration Center in the ISC.
- 2. Click Health Monitoring in the Navigation Tree.
- 3. Select **Configure Health Monitoring** in the drop-down menu in the Health Monitor portlet, as shown in Figure 23-125.

				-
Welcome iscadmin			My Favorites	💌 🛛 Edit my profile 🔷 Help 🔷 Log out
Integrated Solutions Console				<b>IEM.</b>
Work Items Status Settings	Health×			<ul> <li>B)</li> </ul>
View : No group filter	Health Monitor			<u>Close page</u>
Welcome	Health Monitor			? _ 🗆
Tivoli Storage Manager	Use the health monitor to determ schedules, the server database ar provides access to the server activ	ine the overall status of server op nd recovery log, and the status of vity log, which allows you to view m	erations and to obtain o storage devices manag pessages generated dur	detailed information about client node ed by the server. The health monitor also ing server operations.
Getting Started				
Health Monitor	🕂 📽 🖉 🖻 🖿 🕇	Select Action	Go	
Enterprise Management	Select ^	View Health Details	^	Health ^
Storage Devices	•	Configure Health Monitor	UM1	Normal
Policy Domains and Client Nodes	Page 1 of 1	Modify Server Connection Remove Server Connection	1 Selected: 1	
Server Maintenance		Server Properties		
Reporting	This portlet will refresh in 4 minut	Use Command Line Halt Server		

Figure 23-125 Configure Health Monitor

4. Enter the password and refresh interval to enable the Health Monitor, as shown in Figure 23-126.

Welcome iscadmin		My Favorites 💽 Edit my profile Help Log out
Integrated Solutions Console		
Work Items Status Settings	Health	<ul> <li>b</li> <li>b</li> </ul>
View : No group filter	Health Monitor	<u>Close page</u>
Welcome	Health Monitor	250
Entral Change Manager	Configure Health Monitor	
Getting Started Health Monitor Enterprise Management Storage Devices Policy Domains and Client Nodes Server Maintenance	named ADMIN_CENTER is created on each server at the time o monitor. The initial password is ADMIN_CENTER. To protect you administrator on each server by entering a new password here Password Password (re-enter to confirm) Refresh Interval 5 Minutes	f its installation or upgrade, and it is intended for use by the health rr system, change the initial password for the ADMIN_CENTER
Reporting	OK Cancel	

Figure 23-126 Enter password and refresh interval

- 5. Click **OK** to complete.
- 6. The status of your Tivoli Storage Manager Server is displayed, as shown in Figure 23-127 by clicking **Health Monitor** in the **Navigation Tree**.

Welcome Admin User			My Favorites 🛛 👻	Edit my profile Help Log out
Integrated Solutions Console				
Work Items Status Settings H	Health			<ul> <li>B</li> </ul>
View : No group filter	Health Monitor			<u>Close page</u>
Welcome	Health Monitor			? = 0
Tivoli Storage Manager	Use the health monitor to determin schedules, the server database and provides access to the server activit	e the overall status of server operat recovery log, and the status of sto y log, which allows you to view mess	ions and to obtain detaile rage devices managed by ages generated during se	d information about client node the server. The health monitor also rver operations.
Health Monitor	** *? 🖌 2 🖜 音 📗	fiew Health Details 💌 Go		
Enterprise Management	Select ^	Server ^		Health ^
Storage Devices	•			ormal
Policy Domains and Client Nodes	Page 1 of 1 T	otal: 1 Filtered: 1 Displayed: 1	Selected: 1	
Server Maintenance				
Reporting	This portlet will refresh in 4 minutes	and 27 seconds.		

Figure 23-127 Health monitor drop-down selection

7. Select the **Health Monitor** drop-down to display more details, as shown in Figure 23-128.

Welcome Admin User		My Fa	vorites 🔹 Edit	: my profile   Help   Log out
Integrated Solutions Console				
Work Items Status Settings	Health			< > B
View : No group filter	Health Monitor Server Details			<u>Close page</u>
Welcome	POLONIUM1 Health Monitor			2 - 0
Getting Started Getting Started Health Monitor Enterprise Management Storage Devices Policy Domains and Client Nodes Server Maintenance Reporting	Schedule Information <ul> <li>0 Unsuccessful schedules</li> <li>2 Missed schedules</li> <li>0 Successful schedules with warnings</li> <li>0 Successful schedules</li> </ul> This portlet will refresh in 4 minutes and 50 second the second s	Database Information Good	Activity Log 129 Warnings 441 Errors	Storage Device Status Good
	<ul> <li>Database and Recovery Log Information</li> <li>Activity Log</li> <li>Storage Device Status</li> </ul>			

Figure 23-128 Health monitor details

The expanded view of the Health Monitor as seen in Figure 23-129 provides further access to Schedule Information events, Server database, and Recovery log management functions, Activity log viewer with date and message type filters and Storage Device status.

zetaneu Health Inn	ormation for P	OLONIUM1				
Schedule Infor	mation					
The table shows	client node a	nd administrativ	ve schedule inforn	nation from the p	ast 24 hours.	
Filter schedule e Successful Update Table	vents to view	with errors 🗖	Missed 🗖 Faile	d		
🛛 👯 🗣 🖉		Select Actior	Go			
Status ^ Res	ults ^ Schee	duled Start 🔺 .	Actual Start \land S		Client Node Name	∧ Domain Name ∧
	т	otal: 0 Filtered	: O Displayed: C			
Database and I	Recovery Lo	g Information				
Server Databa	se Informati	on				
<ul> <li>The data</li> <li>The data</li> <li>Consider</li> <li>The last</li> <li>The data</li> </ul>	base is using base cannot b creating a da database bac base cache hi	2 percent of 1,0 be extended with tabase space tr kup was on 11/2 t ratio is 99,65	)24 MB allocated : nout adding volun igger, which autor 24/04 11:26 AM. ( percent. The idea	space. nes. natically increase 5.81 MB of the da cache hit ratio is	s the database size atabase has changed s between 98 and 10	as necessary. d since the last backup. 10 percent.
Recovery Log	Information					
<ul> <li>The recovery</li> <li>The recovery</li> <li>Consider cre</li> <li>The recovery</li> </ul>	log is using i log cannot b ating a recove log is in roll f	7.1 percent of 5 e extended with ery log space trig forward mode. T	12 MB allocated s out adding volum gger, which autom here is a databas	pace. es. atically increases e backup trigger	the recovery log siz defined.	e as necessary.
Work with da Add a datab Add a recove Backup the o Create a dat Create a rec	itabase and re ase volume iry log volume database iabase space f overy log spar	ecovery log trigger te trigger				
Activity Log						
Messages gener and click Update Filter No filter	rated during s 2 Table, The s Searc	erver operations earch string is c h string	are stored in the ase-sensitive.	activity log. Use	the controls to spec	ify the messages to di
Start date	End date					
Filter messages	to view					
🗆 Severe 🗖	Error 🗋 War	rning 🗖 Diagn	ostic			
Update Table	2					
Storage Device	Status					
The table shows	the status of	libraries and dr	ives managed by	this server.		
*** **		Select /	Action	Go Go		
Select ^ Libra	ary Name \land	Drive Name \land	Mounted Volume	∧ Status ∧	Process Number 🔿	Session Number 🔿
O TSM	LIB01	DRIVE01		Online		
O TSM	LIBO1	DRIVE02		Online		

Figure 23-129 Expanded view of Health Monitor Details

### 23.5.11 Favorites

Adding pages to the **Favorites** drop-down allows quick access to pages or portlets which are most often used.

Using **Favorites** allows a meaningful view of your Tivoli Storage Manager Servers to be displayed. This is useful for monitoring large environments or complex installations. See Figure 23-130.

My Favorites 📃 💌	Edit my j
My Favorites Add to favorites Organize favorites	
Favorite Pages	

Figure 23-130 Favorites drop-down list

Favorites can also be managed using the **Organize Favorites** drop-down menu item. Items can be edited to provide more meaningful names or deleted as required. See Figure 23-131.

<u>N</u>	1y Favorites	Edit my profile	Help Log out
			IBM.
licy、× Health、× Health、× Health、× Enterp、×			< > B <sup>1</sup>
Organize Favorites			
Organize Favorites			? _ 🗆
avorites Table			
Favorite Pages		Rename	Delete
Health Monitor Server Details	[	/	Û
Health Monitor	[	/	Û
Policy Domains and Client Nodes	[	/	Û
Storage Devices	[	/	Û
Reporting	[	/	Û
Page 1 of 1 Total: 5 Displayed: 5			
	IlicyX HealthX EnterpX Drganize Favorites Organize Favorites Organize Favorites Cavorites Table Favorite Pages Health Monitor Policy Domains and Client Nodes Storage Devices Reporting Page 1 of 1 Total: 5 Displayed: 5	Iliguni X Health X Health X Enterp X  Drganize Favorites  Organize Favorites  Cavorites Table  Favorite Pages Health Monitor Policy Domains and Client Nodes Storage Devices Reporting Page 1 of 1 Total: 5 Displayed: 5	Iliquit. X     Health X     Health X     Enterp X       Organize Favorites     Organize Favorites       Organize Favorites     Image: Strate Pages       Rename     Image: Strate Page       Health Monitor     Image: Strate Page       Policy Domains and Client Nodes     Image: Strate Page       Strate Devices     Image: Strate Page       Reporting     Image: Strate Page       Page 1 of 1     Total: 5

Figure 23-131 Organize Favorites

**Restriction:** Some portlets can only be accessed by using drop-down and selection combinations, so they do not display if added to the Favorites list.

### Managing open pages

The maximum number of page links displayed in the Administration Center is five. If you have more pages open, you can jump to those pages using the navigation buttons on the Navigation Bar. See Figure 23-132.



Figure 23-132 Zoomed view of navigation buttons

These pages can also be managed using the right-hand button in Figure 23-133.

Welcome Admin User				My Favorites 💽 Edit my profile 🛛 Help	Log out
Integrated Solutions Console					JEM.
Work Items Status Settings	P	olicy、× Health、× S	torag、× Gettin、× Enterp、×		< > B
View : No group filter		Manage Pages			
Welcome		Manage Pages			?
<b>~</b>		Select		Page Name	
LTivoli Storage Manager		0	Policy Domains and Client Nodes		
Getting Started		0	Health Monitor		
Health Monitor		C	Storage Devices		
Enterprise Management					
Storage Devices		С	Getting Started		
Policy Domains and Client		C	Enterprise Management		
Nodes		Page 1 of 1	Total: 5 Displayed: 5		
Server Maintenance		Display page	lose page		
Reporting		Display page C	iosa kaža		

Figure 23-133 Manage pages in Page Navigation Bar

The pages can be closed using the Close page tab removing them from the page cache bar or navigated to using the Display page tab.

**Note:** Only five pages are displayed on the page bar at a time. More pages can be displayed and navigated to using the direction arrows but there may be a performance hit as well as making navigation between pages more complex.

### 23.5.12 Protecting the ISC Server

It is recommended that you back up your ISC server in order to protect your IBM Tivoli Storage Manager environment from disaster.

You should treat the ISC Server as if it were another IBM Tivoli Storage Manager server, since it provides the Administrative interface to control your Tivoli Storage Manager Server installation. More detail is provided in the Integrated Solutions Console and Administration Center readme documentation.

# 24

### **Operational Reporting**

This chapter describes Operational Reporting, which was introduced with the IBM Tivoli Storage Manager 5.2.2 Server code.

### 24.1 Introduction

The IBM Tivoli Storage Manager Operational Reporting feature automates some of the monitoring tasks you typically perform manually. By generating reports and monitors, Operational Reporting notifies you if a server requires attention.

Operational reports can be scheduled to run daily and are generated even if there are no problems. Operational monitors are special types of reports, and can be scheduled to run hourly. The monitors will send you a notification only if there are issues. Operational Reporting does not maintain a separate database of information and is not a trending tool.

Operational Reporting is included as part of the Tivoli Storage Manager for Windows server and is also available as a stand-alone package for a Windows server. For information on installing the stand-alone package, see "Installing the IBM Tivoli Storage Manager Operational Reporting Stand-alone Package" in the IBM Tivoli Storage Manager for Windows Administrator's Guide.

### 24.1.1 Functions

Operational Reporting is administered through the Microsoft Management Console on a Windows machine. All platforms of IBM Tivoli Storage Manager servers, Version 5.1.8 or Version 5.2.2 and later, are supported. Operational Reporting runs as a service and supports multiple Tivoli Storage Manager servers running on a single machine.

An operational report consists of the following parts: a standard report, a customized summary, and optional extensions that you can create. You can select which sections to include in the report. The Operational Reporting installation package contains two default custom summary templates: one for a report and one for a monitor.

Default e-mail messages will notify you if the server is running smoothly, or if there are issues such as failed or missed schedules. You can also link to a Web summary page to check operational reports about your server. An operational monitor will notify you either through e-mail or by sending an instant message to your Windows desktop. Operational Reporting can write data to a file which can be read by a Tivoli Enterprise<sup>™</sup> Console log file adapter. The log file adapter reads the information and forwards it to the Tivoli Enterprise Console®.

### 24.1.2 Using IBM Tivoli Storage Manager Operational Reporting

A Tivoli Storage Manager server must be running in order to generate reports and monitors. These can be sent to multiple users such as server administrators or managers. If there are problems, they appear at the beginning of the report along with recommendations on how to fix them. Any issues in the report are followed by the standard section, custom summary, a timing section, and any optional extensions. Monitors do not contain standard sections and typically run more quickly and frequently.

Reports and monitors have default values. Reports and monitors can run simultaneously and can either be scheduled or run as needed. They allow you to flag issues by specifying notification rules in the custom summary section. If a threshold in a notification rule is met, you will be notified.

Reports and monitors include a timing section, which can help you determine performance problems. For example, if a report or monitor seems to be running slowly, you can use the timing section to identify where the time is being spent, and you can eliminate or optimize a section accordingly.

### 24.1.3 MMC Plugin

Operational Reporting is administered using the Microsoft Management Console plugin interface, as shown in Figure 24-1.



Figure 24-1 MMC View showing Operational Reporting elements

A default report can be created by right-clicking the Operational Reports icon and clicking New from the menu. Selecting all sections for the report means a large amount of detail will be gleaned from your IBM Tivoli Storage Manager Server. You can add e-mail recipients for the whole report and/or automatic notification recipients for failed or missed schedules.

### 24.1.4 Creating a default Daily Report

Creating a default Daily Report is a straightforward process of following the steps below, where the defaults have been chosen. Further information can be obtained by selecting all Report Sections in the Report Details section of the Properties box.

1. Open the IBM Tivoli Storage Manager Management Console and expand the Tivoli Storage Manager Server icon, as shown in Figure 24-2.



Figure 24-2 MMC view of Tivoli Storage Manager Server - Reports

2. Right-clicking the Operational Reports icon after expanding the MMC view produces a menu as shown in Figure 24-3.



Figure 24-3 Right click menu

3. Click New to open the dialog box shown in Figure 24-4.

Name		×
Computer:	POLONIUM	
Instance:	TSM Server1	
Type in a nan	ne for the report	
Daily Report		
OK	Cancel	

Figure 24-4 Enter Report name

4. Accept the default name or enter a new one.

5. Choose the Report Sections for the report. The **Select all** button can be used to ensure that all sections will be reported on. See Figure 24-5.



Figure 24-5 Select Report Sections for report

6. Once you have selected all the Report Sections, you could click **OK** and use this standard report without forwarding it to any recipients. It would then only be accessible to anyone with access to the IBM Tivoli Storage Manager Administration Console.

7. Figure 24-6 shows the dialog box with the **E-mail Recipients** tab active. Here you can add e-mail recipients as required.

Properties				×
Report Details E-mai	Recipients Automatic Notifica	tion		
Report recipients				
Recipient name	E-mail Address	Format		.
Administrator	admin@stor.age.com	Text	Import	
			E <u>x</u> port	
			Edit	111
			Delete	:11
				1   L
				11
•		Þ		
Recipient name	E-mail address	ormat		. 11
	[]	ext 💌	Add	
		Cancel	Á polu	-11
	UK	Carleer		

Figure 24-6 Add E-mail recipients

8. You can choose recipients to automatically notify for specific nodes. This is useful if certain node backups are managed by other members of your IBM Tivoli Storage Manager administration team. The interface is illustrated in Figure 24-7.

Properties	×
Report Details E-mail Recipients Automatic Notification	
Node contact information 4 of 11 updated	
Node Con E-mail Address Notification Ty 🔺	Nodes
	Query
URETE Kris kris@island.com	<u>U</u> pdate
CRETE2 JAYKE Jayke my.bro@free.com	Scheduled nodes only
KATHY     POLONIUM Armin santa@klos.com     RAPHAEL     RESIRT4	Schedule Notification Messages <u>F</u> ailed
■ RESIRT4A ■ SARAH ▼	<u>M</u> issed
Node name         Contact name         E-mail address           CRETE         Kris         kris@island.com	Node Up <u>d</u> ate
Send e-mail notification for	
Uther contact information	
litsu-team aix-client	
OK Cancel	Apply

Figure 24-7 Choose Automatic Notification recipients for specific nodes

9. Clicking **OK** completes the process.

The top of a daily report is shown in Figure 24-8: Further information is provided further down on the page, but the most important details are shown at the top, using different colors to highlight any issues.

erver name: POLONIUM1, platform: Windows, version: 5.3.0.0, date/time: 12/02/	/2004 05:30:04	
ssues and Recommendations		
Issue	Condition	Recommendation
Too many admin schedules have missed.	2 > 0	Check the activity log.
There are not enough scratch volumes available.	3 < 5	Check in some scratch tapes
Custom Summary		
Item		Results
Administrativ	e Schedules Successful:	0
Adminis	strative Schedules Errors:	0
Adminis	strative Schedules Failed:	0
Administ	rative Schedules Missed:	2
Client Schedules C	ompleted with No Errors	0
Client Schedules Comp	pleted with Skipped Files:	0
Client Schedules C	ompleted with Warnings:	0
Client Schedule	s Completed with Errors:	0
	Client Schedules Failed:	0
	Client Schedules Missed:	0
Scheduled Nodes with e	mpty contact information:	0
	Total GB Backed Up:	0.52
	Total GB Restored:	
	Total GB Archived:	0.75
	Total GB Retrieved:	
	Last Database Backup:	2004-12-01 20:19
	% Database Utilization:	5.0
D	atabase Cache Hit Ratio:	99.6

Figure 24-8 Top part of Daily Report with highlighted errors

### 24.1.5 Creating a default Hourly Monitor

Creating a default Hourly Report is also a straightforward process of following the steps below where the defaults have been chosen. Further information can be obtained by selecting all Report Sections:

- 1. Right-click the Operational Monitors icon and select New from the menu.
- 2. Enter a name or accept the default and click **OK** as shown in Figure 24-9.

Name		×
Computer:	POLONIUM	
Instance:	TSM Server1	
Type in a nam	he for the monitor.	
Hourly Monite	or	
OK	Cancel	

Figure 24-9 Create new Hourly Monitor

- 3. The default selection is shown in Figure 24-10 and will give a general overview of your Server, showing:
  - Client Schedules Missed
  - Percentage Database Utilization
  - Percentage Maximum Recovery Log Utilization
  - Percentage Disk Pool Utilization
  - Number of offline drives
  - Number of scratch volumes

Properties	×
Monitor Details E-mail Recipients Net Send Recipients	
Monitor report contents	
Report Section	
🗹 🗎 Custom Summary	Add
🗹 🗎 Report Timing Information	Settings
	Delete
	0000
	Select all
	Clear all
Activate monitor Use collapsable sections	
Minute to start Period covered Repeat every	Web versions
30 + 1 + Hour(s) 1 + Hour(s)	
OK Cancel	Apply

Figure 24-10 Monitor details

4. Add E-mail recipients as shown in Figure 24-11.

Properties				×
Monitor Details E-mail Re	cipients Net Send Reci	pients		
Report recipients				
Recipient name	E-mail Address	Format		
🗐 N E One	ne1@stor.age.com	Text	Import	
			E <u>x</u> port	
			Edit	1
			Delete	11
		Þ		
Recipient name E-m	ail address	Format		
IT Support ] ad	equ@te.com	Text	<u>A</u> dd	
			1	
	ОК	Cancel	Apply	

Figure 24-11 E-mail recipient information

 Further recipients can be informed using the Net Send Recipients tab for instant notification of any issue reported by the hourly report as shown in Figure 24-12.

Properties			X	1
Monitor Details E-mail Recipients	Net Send Recip	ients		
Notify				
User or Computer name				
homepc			<u>E</u> dit	
B mypc kcwb99w			Delete	
			<u>I</u> est	
•		F	Dete <u>c</u> t	
User or computer to potifu				
testbox			Add	
	OK	Cancel	Apply	

Figure 24-12 Net send recipients

**Note:** Using the Net Send Recipients option relies on the Messenger service to work. Many Windows administrators have disabled this service.

Once all of these steps have been completed, you should have a quick glance view of your IBM Tivoli Storage Manager environment's health using either the Hourly Monitor or Daily Report. You can modify what information is provided in these reports, so check if the information in the default reports, or those where all Report Sections have been selected, is relevant. You may find the reports run more quickly and provide less complex views of your environment if you deselect some of the sections, but be aware that this will also mean that less of your environment will be monitored.

Further information on Operational Reporting can be obtained from the following sources:

IBM Tivoli Storage Manager 5.3 for Windows Administrator's Guide:

See the following sections:

- "Generating a Comprehensive Report at Regular Intervals"
- "Generating a Comprehensive Monitor at Regular Intervals"
- "Completing the Set Up" IBM Tivoli Storage Manager for Windows: Administrator's Guide
- "Installing the IBM Tivoli Storage Manager Operational Reporting Stand-alone Package"
- "Generating Reports and Monitors from the Command Line"

Integrating IBM Tivoli Storage Manager Operational Reporting with Event Management - REDP-3850-00:

http://www.redbooks.ibm.com/abstracts/redp3850.html

**Note:** With the new Accurate SAN Device Mapping enhancement, there are new messages now reported, relating to device serial number changes.

The following number ranges are for messages related to serial numbers:

ANR8952 through ANR8958 ANR8961 through ANR8967

See 3.2.1, "Accurate SAN device mapping" on page 28.



# Part 5

## Appendixes

This part of the book provides helpful hints and tips, quick paths, wizards, frequently asked questions, and tables summarizing changes and enhancements for the various versions.



# Α

### Hints and tips

This appendix provides several useful hints and tips.

## Comparison of options virtualnodename/fromnode/asnodename

Here we describe the differences between the client options *virtualnodename*, *fromnode*, and *asnodename*. Table A-1 illustrates the different functions available with each option.

For more details for each option, please see the *IBM Tivoli Storage Manager 5.3 UNIX and Linux Backup-Archive Clients Installation and User's Guide.* 

Function	virtualnodename	fromnode	asnodename
Backup	х		x
Archive	х		x
Restore	х	x	x
Retrieve	x	Х	X

Table A-1 Functions available - virtualnodename, fromnode, and asnodename

### Password required or not

With each option, authentication is handled differently:

virtualnodename	When the virtual node name is accepted by the server, a password is required (assuming authentication is on), even if the <i>passwordaccess</i> option is <i>generate</i> . The advantage of using the <i>virtualnodename</i> option over changing the <i>nodename</i> is that <i>the password prompted for is not saved on the system</i> .
fromnode	The <i>fromnode</i> option permits one node to perform commands for another node. A user on another node must use the <b>set access</b> command to permit you to query, restore, or retrieve files or images for that other node. Because access has to be granted to a given node, you are <i>not prompted for a password</i> . You limited to the query, restore, and retrieve operations which are non-destructive to the original node data.
asnodename	Use the <i>asnodename</i> option to allow agent nodes to back up or restore data on behalf of another node (the target node). Your client node must be granted access to the target node by the Tivoli Storage Manager server <b>grant proxynode</b> command. Authentication is then based on the nodename using the <i>asnodename</i> option.

### Example scenarios of when to use which option

To help you identify in which situation which option is appropriate, we now describe some scenarios for which you might want to use the various options.

### virtualnodename

Before selectively restoring data of another node on a workstation, or backing up data under a different node name, it was common practice to edit the dsm.opt/dsm.sys file and change the nodename. After performing the operation, the *nodename* was changed back. The downside to this is, that the password for that node is saved locally (when *passwordaccess generate* is defined). So this is when *virtualnodename* should be used, because it prompts you for a password without saving it.

### fromnode

A scenario where you might use the *fromnode* option is when giving several nodes access to your data, by using the **set** access command, and not having to worry about anything, because they only have the right to query, restore or retrieve the data.

In a way, this could also be used as a vehicle to perform software distribution. In combination with a script, you could start the setup after the restore.

### asnodename

**Attention:** Ensure that local filesystems of different systems are not accidentally merged when using the *ASNODENAME* option. This would lead to unpredictable results when restoring a system.

The following examples are also included in the UNIX documentation. Please note that this multi-node design can only be exploited as described in a UNIX environment. The *virtualmountpoint* client option is not available to Windows or NetWare clients, and their filespace naming includes the UNC name of the machine making asnodename less practical in a Windows/Netware environment.

### Scheduling example for backing up a GPFS filesystem:

An illustration of a GPFS cluster is shown in Figure A-1. The GPFS team has written a routine which performs the following functions on a GPFS file system: It scans the entire file system for inode changes, creates a list of files that have changed, and then parcels out the list of files to (1 - n) IBM Tivoli Storage Manager Backup-Archive client nodes to move the data.



Figure A-1 Cluster using GPFS and ASNODENAME

Each client node authenticates with the server as the same node name, for example, node\_gpfs. This is done by having a dsm.sys file on each machine with an entry:

#### nodename node\_gpfs

The problem with this solution is that the password expiration cannot be managed automatically. If there are three nodes in the GPFS cluster, each node knows the password to node\_gpfs. If the server expires the password, then one node will reset the password and the other two will no longer be able to authenticate. The only solution to this is to either turn node authentication off at the Tivoli Storage Manager server or to manually reset the password and manually update all three nodes with the new password.

The Tivoli Storage Manager scheduler is not currently used in this solution but it can be easily seen that there could be a single schedule for node\_gpfs which executes the file system scan / workload creating from one client machine via a macro. This schedule would be associated with one of the three nodes only, for example, node\_1.

A better solution can be realized with multi-node support. Using the example of three nodes in the GPFS cluster which would participate in the backup:

1. Define four nodes on the Tivoli Storage Manager server: node\_1, node\_2, node\_3 and node\_gpfs. node\_1, node\_2 and node\_3 are only used for authentication; all filespaces are stored with node\_gpfs.

```
REGISTER NODE node_1 mysecretpw
REGISTER NODE node_2 mysecretpw
REGISTER NODE node_3 mysecretpw
REGISTER NODE node_gpfs mysecretpw
```

2. Define a proxynode relationship between the nodes:

```
GRANT PROXYNODE TARGET=node_gpfs AGENT=node_1, node_2, node_3
```

3. Define the node name and asnode name for each of the machines in their respective dsm.sys files:

```
nodename node_1
asnodename node_gpfs
```

4. Optionally define a schedule for only node\_1 to do the work:

```
DEFINE SCHEDULE STANDARD GPFS_SCHEDULE ACTION=MACRO
OBJECTS="gpfs_script"
DEFINE ASSOCIATION STANDARD GPFS node_gpfs
```

5. On node node\_gpfs, execute the schedule:

DSMC SCHED

Another way to back up GPFS is to use Tivoli Storage Manager to look for the incremental changes. The GPFS file system can be divided into three branches and each branch statically assigned to each node using the virtualmountpoint option. Assume a file system called /gpfs with three branches /gpfs/branch\_1, /gpfs/branch\_2, and /gpfs/branch\_3:

1. Define four nodes on the Tivoli Storage Manager server: node\_1, node\_2, node\_3 and node\_gpfs. node\_1, node\_2 and node\_3 are only used for authentication; all filespaces are stored with node\_gpfs.

```
REGISTER NODE node_1 mysecretpw
REGISTER NODE node_2 mysecretpw
REGISTER NODE node_3 mysecretpw
REGISTER NODE node_gpfs mysecretpw
```

2. Define a proxynode relationship between the nodes:

```
GRANT PROXYNODE TARGET=node_gpfs AGENT=node_1,node_2,node_3
```

3. Define the node name (not the asnodename!), virtualmountpoint, and domain for each of the three machines in their respective dsm.sys files:

```
nodename node_1
virtualmountpoint /gpfs/branch_1
domain /gpfs/branch_1
```

**Note:** The user does not want to define *asnodename* in the options file. In this case the *asnodename* must come on the schedule so that each one of the nodes can have it's own schedule associated with its real node name.

4. Define a schedule for all nodes: node\_1, node\_2 and node\_3

DEFINE SCHEDULE STANDARD GPFS\_SCHEDULE OPTIONS="-asnode=node\_gpfs" DEFINE ASSOCIATION STANDARD GPFS node\_1,node\_2,node\_3

5. Start the scheduler on the three nodes:

DSMC SCHED

#### Scheduling example for backing up an HACMP cluster

Consider an example where HACMP is configured for two AIX hosts, host\_a and host\_b. Along with their own local data, the hosts are sharing SSA storage which has two filespaces: /ssa1 and /ssa2.

The *CLUSTERNODE* example shows how the *CLUSTERNODE* option is used in a current HACMP environment (this is informational only to contrast the example of using ASNODENAME below):

1. Define three nodes on the Tivoli Storage Manager server: host\_a, host\_b, cluster\_group

```
REGISTER NODE host_a mysecretpw
REGISTER NODE host_b mysecretpw
REGISTER NODE cluster_group mysecretpw
```

2. Define a dsm.opt file on host\_a and host\_b (note that the opt files are different on each host):

NODENAME host\_a (option can be left as default) DOMAIN /home /usr ... etc.

3. Define a dsm.opt file located somewhere on one of the cluster disk groups, for example, /ssa1/tsm/dsm.opt,

NODENAME cluster\_group DOMAIN /ssal /ssa2 CLUSTERNODE YES

4. Define a schedule on the Tivoli Storage Manager server:

DEFINE SCHEDULE STANDARD CLUSTER\_BACKUP

5. Define associations for each of the three nodes:

```
DEFINE ASSOC STANDARD CLUSTER_BACKUP host_a,host_b,cluster_group
```

- At any one time, there are three instances of the Backup-Archive client schedule running (with the scheduler for cluster\_group being part of the cluster resources that will failover whenever the cluster group disk resources failover. Thus, it would be running on either host\_a or host\_b but not both simultaneously)
- 7. All three node names will contain data on the Tivoli Storage Manager server

The ASNODE example shows how this can be configured without the use of CLUSTERNODE; this is a generic solution which could be applied to UNIX cluster solutions, for example, Veritas Cluster Server for Solaris.

1. Define 3 nodes on the Tivoli Storage Manager server: host\_a, host\_b, cluster\_group

REGISTER NODE host\_a mysecretpw REGISTER NODE host\_b mysecretpw REGISTER NODE cluster\_group mysecretpw

2. Define a proxy node relationship between host\_a and host\_b to cluster\_group

GRANT PROXYNODE TARGET=cluster\_group AGENT=host\_a,host\_b

3. Define a dsm.opt file on host\_a and host\_b to handle the local file systems:

```
NODENAME host_a (option can be left as default)
DOMAIN /home /usr ... etc.
```

NODENAME host\_b (option can be left as default) DOMAIN /home /usr ... etc.

4. Define a dsm.opt file on the cluster resource to handle the backup of the clustered resources, for example, /ssa1/tsm/dsmcluster.opt (note the nodename will be the default nodename which will either be host\_a or host\_b depending on which machine contains the cluster group at any given time):

DOMAIN /ssa1 /ssa2 ASNODE cluster\_group

5. Define a schedule on the Tivoli Storage Manager server:

DEFINE SCHEDULE STANDARD CLUSTER\_BACKUP

6. Define associations for each one of the 3 nodes.

DEFINE ASSOC STANDARD CLUSTER\_BACKUP host\_a,host\_b,cluster\_group

7. At any one time, there are three instances of the Backup-Archive client schedule running with the scheduler for node hacmp\_cluster running on either host\_a or host\_b but not both (it is included in the cluster resources that would failover). This scheduler would point to the dsmcluster.opt that is defined on each host. The three instances would be started as:

```
[host_a] dsmc sched
[host_b] dsmc sched
[cluster_group] dsmc sched -optfile=/ssa/tsm/dsmcluster.opt
```

8. All three node names will contain data on the Tivoli Storage Manager server

**Note:** The multiple node design as described above can only be exploited in a UNIX environment and not on Windows and Netware Systems. The *asnodename* option is available on Windows systems, but there is not as much benefit in using this because of the filespace naming limitations inherent in Windows systems.

### Installation of the new Java GUI

With Version 5.3 of the IBM Tivoli Storage Manager Client for UNIX the old Graphical User Interface (GUI), which was started with dsm, has been replaced by the common Java GUI, which is started with dsmj.

**Requirements:** 

- ► JRE 1.4.1 or higher
- Mozilla 1.4 with Java Runtime Environment (JRE) 1.4.1 or higher (only for the Web Client)
- Set the system ulimit values to unlimited (-1) if restoring very large (2 GB) files with HSM or the backup-archive client.

The Tivoli Storage Manager code can restore these large files with enough system resources. There may be restore failures, though, if the ulimits are set to lower values.

After the installation of the client code and setup for Backup-Archive Client, do the following.

Add the java binary directory to your PATH variable to /etc/environment. export PATH=\$PATH:<JAVA\_BIN\_DIR> where JAVA\_BIN\_DIR is the path to the "java" executable, as shown in Example A-1.

Example: A-1 Example of a PATH

PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java14\_64/jre/bin :/usr/java14\_64/bin

From a UNIX shell prompt, start the IBM Tivoli Storage Manager Java GUI by typing **dsmj**. The command **dsm** no longer exists.

If you wish to use this command for compatibility reasons, you can perform the

following: create a symbolic link in /usr/bin which points from **dsm** to **dsmj**, as shown in Example A-2.

Example: A-2 Creating symbolic link to dsm

#cd /usr/bin				
<pre>#ln -s /usr/tivoli/tsm/client/ba/b</pre>	in/dsmj dsm			
#ls -lisa dsm*				
6978 0 lrwxrwxrwx 1 root	system	34 Nov 24 10:19 dsm ->		
/usr/tivoli/tsm/client/ba/bin/dsmj				
6970 0 lrwxrwxrwx 1 root	system	37 Nov 24 08:55 dsmadmc ->		
/usr/tivoli/tsm/client/ba/bin/dsma	dmc			
6968 0 lrwxrwxrwx 1 root	system	38 Nov 24 08:55 dsmagent ->		
/usr/tivoli/tsm/client/ba/bin/dsmag	gent			
6969 0 lrwxrwxrwx 1 root	system	34 Nov 24 08:55 dsmc ->		
/usr/tivoli/tsm/client/ba/bin/dsmc				
6967 0 lrwxrwxrwx 1 root	system	36 Nov 24 08:55 dsmcad ->		
/usr/tivoli/tsm/client/ba/bin/dsmcad				
6975 0 lrwxrwxrwx 1 root	system	33 Nov 24 09:49 dsmfmt ->		
/usr/tivoli/tsm/server/bin/dsmfmt				
6972 0 lrwxrwxrwx 1 root	system	41 Nov 24 08:55 dsmgpfs.drv		
-> /usr/tivoli/tsm/client/ba/bin/dsmgpfs.drv				
6533 0 lrwxrwxrwx 1 root	system	34 Nov 24 08:55 dsmj ->		
/usr/tivoli/tsm/client/ba/bin/dsmj				

### **Reasons for restarting a Storage Agent**

In most cases, it is no longer necessary to halt and restart a LAN-free Storage Agent to pick up changes in the Data Manager server.

For example:

Changing the ExternalManager attribute of the path definition for an External Library it is not necessary to stop and restart the Storage Agent.

For each new client session, the Storage Agent refreshes the Library and associated path information on the Storage Agent. For Shared Libraries, changes to the designated Primary Manager are reflected on the Storage Agent when the next client session begins.

There are times, however, when the Storage Agent must be restarted to obtain changes.

If the Server attributes of the Primary Library Manager for a Shared Library change, restarting the Storage Agent is required to recognize these changes. This would be necessary if the password or highlevel/lowlevel address of the

server definition were changed on the Data Manager server and the Storage Agent is using that specific Library. The Storage Agent must also be restarted if authorization is turned off on the Primary Library Manager.

- If the REName STGpool command is used on a LAN-free storage pool, restarting the Storage Agent is required to discern this change.
- Deleting or deleting and redefining a LAN-free storage pool with the same name but different attributes will not be reflected on the Storage Agent without halting and restarting it.
- Updating storage pool attributes are not reflected on the Storage Agent. Stopping and restarting the Storage Agent is required to pick-up the changes.

The effects on LAN-free storage pools outlined above are not critical enough to cause serious problems. Storage pools, libraries, and device classes stored in core memory on Storage Agents are used to determine potential LAN-free destinations. Final arbitration and target volume selection occurs on the Data Manager Server. Certain storage pool attribute updates may result in a failed request rather than the desired LAN failover by the Storage Agent. If the Storage Agent accurately predicts a LAN-free destination, the LAN-free operation will most likely be successful. However if the Storage Agent inaccurately predicts that a LAN-free destination exists and the server is unable to substantiate the request the operation has advanced past the point where LAN failover will occur and the storage request is unsuccessful.

### **Device driver on Windows 2003 Servers**

Previous implementations of the Tivoli Storage Manager Device driver allowed a wizard interface to be run to install the driver. With the latest implementation of the Tivoli Storage Manager Device driver and Windows 2003 Servers this is no longer the method employed to connect your devices.

Storage devices are automatically recognized by the Operating System and Windows installs its own device drivers for this. These are not the correct Tivoli Storage Manager drivers. Before installing your devices ensure that the **Removable Storage** Service is disabled on your system.

To install the correct drivers, follow these steps:

- 1. Open the **Device Manager**, locate the device to update and right-.click
- 2. Select Update Driver from the menu.


Figure A-2 Install from specific location

- 3. Select Install from a list or specific location (Advanced) and click Next, as shown in Figure A-2.
- 4. Select **Don't search, I will choose the driver to install** and click **Next** again as per Figure A-3

C Search fo	r the best driver in these locations.
Use the cl paths and	neck boxes below to limit or expand the default search, which includes local removable media. The best driver found will be installed.
∏ Se	arch removable media (floppy, CD-ROM)
🔽 Inc	lude this location in the search:
×4	TSM_5_3\install\devdrvr\win Browse
Don't sea	rch. I will choose the driver to install.
Choose th	is option to select the device driver from a list. Windows does not guarantee

Figure A-3 Do not search for driver

5. Choose **Tape Drives** or **Medium Changers** as appropriate from the hardware type list shown in Figure A-4and click **Next** 

Hardware Update Wizard				
Select the device driver you want to in	istall for this hardware.			
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click. Have Disk.				
Manufacturer Model (Standard tape drives) Archive Benchmark IBM T Cetance	mark DLT1 Tape Drive iveli Storage Manager for Tape Drives			
Compag DEC This driver is not digitally signed! Tell me why driver signing is important	Have Disk			
	< <u>B</u> ack <u>N</u> ext > Cancel			

Figure A-4 Select device driver

6. In our example we are adding a Benchmark DLT1 Tape Drive so we chose Benchmark in the **Manufacturer** pane and IBM Tivoli Storage Manager for Tape Drives in the **Model** pane.

Hardward	e Installation
1	The software you are installing for this hardware: IBM Tivofi Storage Manager for Tape Drives has not passed Windows Logo testing to verify its compatibility with this version of Windows. <u>Tell me who this testing is important</u> ]
	Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Nicrosoft strongly recommends that you stop this installation now and contact the hardware venduof for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

Figure 24-13 First certification warning

- 7. Ignore the Windows logo testing warning shown in Figure 24-13 as this is not a Microsoft driver
- 8. The Update Driver Warning is displayed again as this is an IBM driver but can still be ignored. The warning is shown in Figure A-5 below.



Figure A-5 Final warning

- 9. Your device should now be successfully installed. If you have installed a tape driver, all of your tape devices should be updated to ensure they are using the correct Tivoli Storage Manager Device driver.
- 10. Repeat the above process for the Medium Changer using the IBM Tivoli Storage Manager for Medium Changers version of the driver.

Tivoli Storage Manager should now correctly identify and access your devices.

#### **Command line access**

With the new Administration Center interface the ability to display the Command Line prompt still exists but the steps to implement it are a little more complex.

Open a view of your Tivoli Storage Manager server in the Administration Center such as the Enterprise Management view.

Select the server you wish to administer with the command line by clicking the select radio button.

Click the **Select Action** drop down list and scroll down to Use Command Line.

Click **Go** to display the command line as a portlet, as shown in Figure A-6.

Welcome Admin User			My Favorites	Edit my profile Help	Log out
Integrated Solutions Console					IBM.
Work Items Status Settings	User a×Enterp×				< > 6
View : No group filter	Enterprise Management			2	<u>lose page</u>
Welcome	Enterprise Managemen	t			? - 0
Tivoli Storage Manager Getting Started	The table shows all serv allows them to commun server can also be confi whether it can distribute	vers that you have added to the conso icate and transfer data. Defined serve gured to store another server's data u • or receive configuration information.	le. Use enterprise management rs can be centrally managed usi sing virtual volumes. A server's	to define servers to one another, ing the command routing feature. A enterprise configuration role deterr	which A defined mines
Health Monitor	******	👔 📅 🛛 Select Action	Go		
Enterprise Management	Select ^	Server Name \land	Enterprise	Configuration Role	
Storage Devices Policy Domains and Client	0	CRETE1	Not managed		
Nodes Server Maintenance	۲	POLONIUM1	Not managed		
Reporting	Page 1 of 1	Total: 2 Filtered: 2 Displ	ayed: 2 Selected: 1		
	POLONIUM1 Command Use Command Line Use the command for mo "help" command for mo Server Command Submit Comman Command Results	Line to issue administrative commands to t rere information, including command sy d	he server. Enter a command an	d dick Submit Command. Issue the	<b>? □ × 1</b>

Figure A-6 Administration Center showing Command Line

#### Perform a restore of another node on your own client

Here are examples of Node Access List, Access Another Node and View Policy Information.

#### **Node Access List**

In order to allow other users access to your backup versions and archive copies, you must first grant authority by selecting **Utilities**  $\rightarrow$  **Node Access List...** from the Web client interface. The window shown in Figure A-7 is displayed.

	Node Access List				
	Grant Access to Node:	Filespace Name:	Directory:	Filename:	
					Add
					Change
					Delete
	OK	C	ancel	Help	
ļ					

Figure A-7 Web client: Node access list

Then add a node for which you wish to grant access to your backed up or archived filesystem or directory, as shown in Figure A-8.

Add Access Rule	<u>? × </u>
Permit Access to: Backed up 0 Grant Access to Node: SABAH	bjects
Filespace and Directory:	HAEL ile Level
Filename: ×	
Include subdirectories	
OK Cancel	Help

Figure A-8 Web client: Granting access to another node for filespace or directory

Having granted another node access to your filesystem or directory, this node is added to the Node Access List illustrated in Figure A-9.

l	🖥 Node Access List	t				
	Permit Access to: Backed up Objects Backed up Objects	Grant Access to Node: SARAH SARAH	Filespace Name: \\klchl2m\c\$ \\klchl2m\c\$	Directory: \*	Filename: × ×	Add
						Change
						Delete
	ОК		Cancel		Help	

Figure A-9 Web client: Node access list with added node

Granting another node access to your filesystem or directory can also be performed from the client command line. An example is shown in Example A-3.

Example: A-3 SET ACCESS and QUERY ACCESS

tsm> Set	Access Back	up \\klchl <mark>2m</mark> \	\c\$\* CHICO	
ANS1148I	'Set Access	command suc	ccessfully completed	
tsm> Set	Access Back	up \\klchl2m <sup>\</sup>	\c\$\*\* CHICO	
ANS1148I	'Set Access	' command suc	ccessfully completed	
tsm> q ac	:			
Туре	Node	User	Path	
Backup	SARAH		\\klchl2m\c\$\*	
Backup	SARAH		\\klchl2m\c\$\*\*	
Backup	CHICO	*	\\klchl2m\c\$\*	
Backup	CHICO	*	\\klchl2m\c\$\*\*	
ANS1148I	'Query Acces	ss' command s	successfully completed	
tsm>				

Now that node SARAH has been granted access by node RAPHAEL to his filesystem, node SARAH can now restore or retrieve data with **Access Another Node...** as described in the next section.

#### **Access Another Node**

In order to access information on the backup versions and archive copies of another node and also to restore the backup versions or retrieve the archives from the other user to your workstation, select **Utilities**  $\rightarrow$  **Access Another Node...** from the Web client interface. The dialog box is shown in Figure A-10.

Access Anothe	r User	×
	Enter Node to Access	
0000		
	Node Name: Taphae	
Set	Default Cancel Help	

Figure A-10 Web client: Access another node

You can then verify access to the data of another node by selecting File  $\rightarrow$  Connection Information, as shown in Figure A-11.

Connection Information	
TSM Server Conn	ection Information
Server Information	
Name:	POLONIUM1
Type:	Windows
Version:	Ver. 5, Rel. 3, Lev. 0.0
Last Access Date:	12/01/2004 18:51:00
Client Information	
Node Name:	SARAH
Accessing As Node:	raphael
Authorization Information	
Authority Level:	Client Owner
Delete Backup Files	"No"

Figure A-11 Web client: checking Connection Information: Accessing As Node

When accessing another node's data using the As Node functionality, clicking **Backup** or **Archive** results in a warning message seen in Figure A-12. This is because it only allows you to *restore* or *retrieve* data.



Figure A-12 Web client: Access another node: warning message

By clicking **Restore**, you can then restore the files of the other node, as shown in Figure A-13.

國 IBM Tivoli Storage Manager - [Restore]		
☐ File Edit Actions Utilities View Window	Help	_ 8 ×
🗉 🖋 温 🗄 🔍		
Restore Estimate Options	Point In Time	Help
🖃 🗐 💼 raphael	Name Size	Modified
🗈 🔲 🌇 Backup Sets	desktop6.ndk 192.00 KB	11/02/2004 14:1
🖻 – 🔲 🗁 notes		
😟 🗝 🗖 🔂 data		
🗄 🛄 🧰 xmlschemas		
J Displaying \\klcbl2m\c\$\notes\data		
For Help, press F1		1.

Figure A-13 Access Another Node: Restore file list



### Β

## Quick paths to performing tasks

This appendix contains tables giving you quick paths to performing common tasks.

#### Administrator

Table B-1 shows quick paths to performing tasks concerning an administrator.

	Task	Path
	Add an administrator	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the Administrators table, click Select Action, select Add Administrator, and click Go.</li> </ol>
	Remove an administrator	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the Administrators table, select an administrator.</li> <li>Click Select Action, select Remove Administrator, and click Go.</li> </ol>
	Grant an administrator access to the Administration Center	<ol> <li>Click the Settings tab above the Work Items list.</li> <li>In the Settings list, click User and Group Management.</li> <li>In the Root table, click •all portal user groups•.</li> <li>In the •all portal user groups• table, click TSM_AdminCenter.</li> <li>In the TSM_AdminCenter portlet, click New user.</li> </ol>
	Lock/unlock an administrator	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the Administrators table, select an administrator.</li> <li>Click Select Action, select Modify Administrator, and click Go.</li> </ol>
	Rename an administrator	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the Administrators table, select an administrator.</li> <li>Click Select Action, select Modify Administrator, and click Go.</li> </ol>

#### **Client node**

Table B-2 shows quick paths to performing tasks concerning a client node.

Table B-2 Client node

Task	Path
Lock/unlock a client node	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Policy Domains table, select a server.</li> <li>Click Select Action, select Search for Client Node, and click Go.</li> <li>Click Update Table</li> <li>In the Client Nodes table, click the name of a client node.</li> <li>In the node's properties notebook, click the Security tab.</li> </ol>
Query the activity log for all messages about a particular client node	<ol> <li>Click Health Monitor in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's health information portlet, click Activity Log.</li> <li>In the Filter list, click No filter and select Client Node Name.</li> <li>In the Search string field, type the name of the client node.</li> <li>Click Update Table.</li> <li>The activity log can also be displayed from the server's properties notebook.</li> </ol>

#### **Database and database volumes**

Table B-3 shows quick paths to performing tasks concerning the database and database volumes.

 Table B-3
 Database and database volumes

Task	Path
Display overall status of the database	<ol> <li>Click Health Monitor in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's health information portlet, click Database and Recovery Log Information.</li> </ol>

Task	Path
Display details about database volumes, including the status of mirror volumes	<ol> <li>Click Health Monitor in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Server Properties, and click Go.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Database table, click the name of a volume.</li> </ol>
Specify the size of the database buffer pool	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Database table, select a database volume.</li> <li>Click Select Action, select Database Properties, and click Go.</li> </ol>

#### **Disk drives**

Table B-4 shows quick paths to performing tasks concerning disk drives.

Table B-4 Disk drives

Task	Path
Vary disk drives online and offline	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries table, click a library name.</li> <li>In the library's properties notebook, click the Drives tab.</li> <li>In the Drives table, select a drive.</li> <li>Click Select Action, select Modify Drive, and click Go.</li> </ol>

#### **Expiration processes**

Table B-5 shows quick paths to performing tasks concerning the expiration processes.

Table B-5	Expiration	processes

Task	Path
Specify the amount of time between automatic expiration processes	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the General tab.</li> </ol>

#### LAN-free data movement

Table B-6 shows quick paths to performing tasks concerning LAN-free data movement.

Table B-6 LAN-free data movement

Task	Path
Enable LAN-free data movement	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, select a client node.</li> <li>Click Select Action, select Enable LAN-free Data Movement, and click Go.</li> </ol>

#### Library volumes

Table B-7 shows quick paths to performing tasks concerning library volumes.

Table B-7 Library volumes

Task	Path
Check in and label volumes for a library	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties notebook, click the Volumes tab.</li> <li>In the Volumes table, click Select Action, select Add Volumes, and click Go.</li> </ol>
Check out volumes from a library	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties notebook, click the Volumes tab.</li> <li>In the Volumes table, click Select Action, select Check Out Volumes, and click Go.</li> </ol>

#### Network-attached storage (NAS) file server

Table B-8 shows quick paths to performing tasks concerning a network-attached storage (NAS) file server.

Table B-8	Network-attached storage	(NAS)	) file server
-----------	--------------------------	-------	---------------

Task	Path
Protect a network-attached storage (NAS) file server	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Data Movers, and click Go.</li> <li>In the server's data movers table, click Select Action, select Create NAS Data Mover, and click Go.</li> </ol>
Schedule NDMP backups for NAS file servers	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrative Schedules tab.</li> <li>Click Select Action, select Create a Schedule, and click Go.</li> </ol>

#### **Restore session**

Table B-9 shows quick paths to performing tasks concerning a restore session.

Table B-9 Restore session

Task	Path
Specify the maximum life of a restartable restore session	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the General tab.</li> </ol>

#### Script

Table B-10 shows quick paths to performing tasks concerning a script.

#### Table B-10 Script

Task	Path
Create a server script	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Scripts tab.</li> <li>In the Scripts table, click Select Action, select Create Script, and click Go.</li> </ol>

Task	Path
Modify a server script	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Scripts tab.</li> <li>In the Scripts table, select a script.</li> <li>Click Select Action, select Modify Script, and click Go.</li> </ol>
Create a script that performs key maintenance tasks	<ol> <li>Click Server Maintenance in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Create a Maintenance Script, and click Go.</li> </ol>
Run a script	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the Scripts tab.</li> <li>In the Scripts table, select a script.</li> <li>Click Select Action, select Run Script, and click Go.</li> </ol>

#### Server

Table B-11 shows quick paths to performing tasks concerning a server.

	Task	Path
	Rename a server	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Remove Server Connection, and click Go.</li> <li>Click Select Action, select Add Server Connection, and click Go.</li> </ol>
	Create a schedule for a server (administrative schedule)	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrative Schedules tab.</li> <li>In the Schedules table, click Select Action, select Create a Schedule, and click Go.</li> </ol>
	Modify a schedule for a server (administrative schedule)	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Administrative Schedules tab.</li> <li>In the Schedules table, select a schedule.</li> <li>Click Select Action, select Modify Schedule, and click Go.</li> </ol>

Task	Path
Issue a command to a server from the command line	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Use Command Line, and click Go.</li> <li>The command line is also available from the Servers tables that are displayed by clicking the following items in the Work Items list:         <ul> <li>Health Monitor</li> <li>Enterprise Management</li> <li>Policy Domains and Client Nodes</li> <li>Server Maintenance</li> </ul> </li> </ol>
Set up one server as the configuration manager for other, managed servers	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Set Up Enterprise Configuration, and click Go.</li> </ol>
Set up server-to-server communication	<ul> <li>Part A:</li> <li>1. Click Enterprise Management in the Work Items list.</li> <li>2. In the Servers table, select a server.</li> <li>3. Click Select Action, select Server-to-Server</li> <li>Communication Settings, and click Go.</li> <li>Part B:</li> <li>1. Click Enterprise Management in the Work Items list.</li> <li>2. In the Servers table, click the name of a server.</li> <li>3. In the servers and server groups portlet, click Servers.</li> <li>4. In the Servers table, click Select Action, select Define</li> <li>Server, and click Go.</li> </ul>

#### Server group

Table B-12 shows quick paths to performing tasks concerning a server group.

Table B-12 Server group

Task	Path
Create a server group	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the servers and server groups portlet, click Server Groups.</li> <li>In the Server Groups table, click Select Action, select Create a Server Group, and click Go.</li> </ol>

#### Storage device

Table B-13 shows quick paths to performing tasks concerning a storage device.

Table B-13 Storage device

Task	Path
Add a new storage device for the server to use	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>Click Select Action, select Add a Storage Device, and click Go.</li> <li>The wizard helps you to create a library, drives, paths, a device class, and storage pools for the device.</li> </ol>
View the status of a storage device	<ol> <li>Click Health Monitor in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's health information portlet, click Storage Device Status.</li> </ol>

#### Storage pool

Table B-14 shows quick paths to performing tasks concerning a storage pool.

Table B-14	Storage pool
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Task	Path
Display information about a storage pool volume	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's Storage Pools table, click the name of a storage pool.</li> <li>In the storage pool's properties notebook, click the Volumes tab.</li> </ol>
Rename a storage pool	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's Storage Pools table, select a storage pool.</li> <li>Click Select Action, select Modify Storage Pool, and click Go.</li> </ol>

#### **Volume history**

Table B-15 shows quick paths to performing tasks concerning volume history.

Table B-15 Volume history

Task	Path
Display volume history	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Volume History, and click Go.</li> </ol>
Modify volume history	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Volume History, and click Go.</li> <li>In the Volumes table, select a volume.</li> <li>Click Select Action, select Modify Volume History, and click Go.</li> </ol>
Backup volume history	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Volume History, and click Go.</li> <li>In the Volumes table, select a volume.</li> <li>Click Select Action, select Backup Volume History, and click Go.</li> </ol>

# С

### Quick paths to creating IBM Tivoli Storage Manager objects

This appendix contains convenient path references for quickly creating and modifying objects.

#### Administrator

Table C-1 shows the quick paths for the administrator.

Task	Path
Create	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Server Properties, and click Go.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the table, click Select Action, select Add Administrator, and click Go.</li> </ol>
View and modify	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Server Properties, and click Go.</li> <li>In the server's properties notebook, click the Administrators tab.</li> <li>In the table, select an administrator.</li> <li>Click Select Action, select Modify Administrator, and click Go.</li> </ol>

#### **Backup Set**

Table C-2 shows the quick paths for the Backup Set.

Table C-2 Backup Set

Task	Path
Create	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's policy domains table, click a name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, click the name of a node.</li> <li>In the node's properties notebook, click the Backup Sets tab.</li> <li>In the Backup Sets table, click Select Action, select Generate backup set, and click Go.</li> </ol>
View and modify	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's policy domains table, click a name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, click the name of a node.</li> <li>In the node's properties notebook, click the Backup Sets tab.</li> <li>In the Backup Sets table, select a backup set.</li> <li>Click Select Action, select Modify Backup set, and click Go.</li> </ol>

#### Client node (including its file spaces)

Table C-3 shows the quick paths for the client node and its file spaces.

Task	Path
Create	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's policy domains notebook, click a domain name.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the table, click Select Action, select Create a Client Node, and click Go.</li> </ol>
View and modify	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's policy domains notebook, click a domain name.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the table, select a node name.</li> <li>In the table, click Select Action, select Modify Client Node, and click Go.</li> </ol>

Table C-3 Client node including file spaces

#### **Data Mover**

Table C-4 shows the quick paths for the Data Mover.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>Click Select Action, select View Data Mover, and click Go.</li> <li>In the server's data movers portlet, click Select Action, select Create NAS Data Mover, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Data Mover, and click Go.</li> <li>In the server's data movers portlet, select a data mover.</li> <li>Click Select Action, select Modify Data Mover, and click Go.</li> </ol>

Table C-4 Data Mover

#### Database space trigger

Table C-5 shows the quick paths for the database space trigger.

Table C.5	Databasa snace	triagor
Table C-5	Dalabase space	ungger

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Database table, click Select Action, select Create Space Trigger, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Database table, select a database volume.</li> <li>Click Select Action, select Modify Space Trigger, and click Go.</li> </ol>

#### **Database volume**

Table C-6 shows the quick paths for the database volume.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Database table, click Select Action, select Add Volume, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Database and Log tab.</li> <li>In the Database table, select a database volume.</li> <li>Click Select Action, select Extend or Reduce, and click Go.</li> </ol>

#### **Device class**

Table C-7shows the quick paths for the device class.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>Click Select Action, select View Device Class, and click Go.</li> <li>In the server's device classes portlet, click Select Action, select Create a Device Class, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Device Class, and click Go.</li> <li>In the server's device classes portlet, select a device class.</li> <li>Click Select Action, select Modify Device Class, and click Go.</li> </ol>

#### Drive

Table C-8 shows the quick paths for the drive.

Table	C-8	Drive

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click the name of a library.</li> <li>In the library's properties portlet, click the Drives tab.</li> <li>In the table, click Select Action, select Add a Drive, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click the name of a library.</li> <li>In the library's properties portlet, click the Drives tab.</li> <li>In the table, select a drive.</li> <li>Click Select Action, select Modify Drive, and click Go.</li> </ol>

#### Library

Table C-9 shows the quick paths for the Library.

Table C-9 Library

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click Select Action, select Create a Library, and click Go.</li> <li>In the Select a Server table, select a server and click Create a Library.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, select a library.</li> <li>Click Select Action, select Modify Library, and click Go.</li> </ol>

#### Management class (including copy groups)

Table C-10 shows the quick paths for the management class.

Table C-10	Management	class	includina	copv	aroups
10010 0 10	managomon	onuou	niolaanig	oop,	groupo

Task	Path	
Create	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Management Classes.</li> <li>In the table, click Select Action, select Create Management Class, and click Go.</li> </ol>	
View and modify	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Management Classes.</li> <li>In the table, select a management class.</li> <li>Click Select Action, select Modify Management Class, and click Go.</li> </ol>	

#### **Option set**

Table C-11 shows the quick paths for the option set.

Task	Path	
Create	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Option Sets.</li> <li>In the table, click Select Action, select Create an Option Set, and click Go.</li> </ol>	
View and modify	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Option Sets.</li> <li>In the table, select an option set.</li> <li>Click Select Action, select Modify Option Set, and click Go.</li> </ol>	

#### Path for a drive

Table C-12 shows the quick paths for the path for a drive.

Table C-12 Path for a drive

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Drive Paths tab.</li> <li>In the table, click Select Action, select Add Path, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Drive Paths tab.</li> <li>In the table, select a drive path.</li> <li>Click Select Action, select Modify Path, and click Go.</li> </ol>

#### Path for a library

Table C-13 shows the quick paths for the path for a library.

Table C-13	Path for a library
Table C-13	rain ior a norary

Task	Path	
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Library Paths tab.</li> <li>In the table, click Select Action, select Add Path, and click Go.</li> </ol>	
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Library Paths tab.</li> <li>In the table, select a library path.</li> <li>Click Select Action, select Modify Path, and click Go.</li> </ol>	

#### **Policy Domain**

Table C-14 shows the quick paths for the Policy Domain.

Table C-14 Policy domain

Task	Path
Create	<ol> <li>Click Policies and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click Select Action, select Create a Policy Domain, and click Go.</li> </ol>
View and modify	<ol> <li>Click Policies and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, select the name of a domain.</li> <li>Click Select Action, select Modify Policy Domain, and click Go.</li> </ol>

#### The role of policy sets

Experienced administrators of Tivoli Storage Manager are probably familiar with policy sets, which contain the management classes within a policy domain. The Administration Center eliminates the need to validate or activate a policy set when you make changes to management classes. In the Administration Center, you work only with the active policy set. Any changes that you make to management classes are immediately activated, without additional effort on your part.

#### Profile (for a configuration manager server)

Table C-15 shows the quick paths for the profile.

Table C-15	Profile for a configu	ıration manager server

Task	Path
Create	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server that is a configuration manager.</li> <li>In the server's profiles table, click Select Action, select Create Profile, and click Go.</li> </ol>
View and modify	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server that is a configuration manager.</li> <li>In the server's profiles table, select a profile.</li> <li>Click Select Action, select Modify Profile, and click Go.</li> </ol>

#### **Recovery log space trigger**

Table C-16 shows the quick paths for the recovery log space trigger.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties notebook, click the Database and Log tab.</li> <li>In the Recovery Log table, click Select Action, select Create Space Trigger, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties portlet, click the Database and Log tab.</li> <li>In the Recovery Log table, select a recovery log.</li> <li>Click Select Action, select Modify Space Trigger, and click Go.</li> </ol>

Table C-16 Recovery space log trigger

#### **Recovery log volume**

Table C-17 shows the quick paths for the recovery log volume.

Table C-17	Recovery loo	volume
	110001019109	voiunio

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Database and Log tab.</li> <li>In the Recovery Log table, click Select Action, select Add Volume, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Database and Log tab.</li> <li>In the Recovery Log table, select a recovery log volume.</li> <li>Click Select Action, select Extend or Reduce, and click Go.</li> </ol>

#### Schedule for client nodes

Table C-18 shows the quick paths for the schedule for client nodes.

Task	Path
Create	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Node Schedules.</li> <li>In the table, click Select Action, select Create a Schedule, and click Go.</li> </ol>
View and modify	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's policy domains notebook, click the name of a domain.</li> <li>In the domain's properties portlet, click Node Schedules.</li> <li>In the table, select a schedule.</li> <li>Click Select Action, select Create a Schedule, and click Go.</li> </ol>

 Table C-18
 Schedule for client nodes

#### Schedule for a server (administrative schedule)

Table C-19 shows the quick paths for the schedule for a server.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's properties portlet, click the Administrative Schedules tab.</li> <li>In the table, click Select Action, select Create a Schedule, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Administrative Schedules tab.</li> <li>In the table, select a script.</li> <li>Click Select Action, select Modify Schedule, and click Go.</li> </ol>

Table C-19 Administrative schedule for a server

#### Server (other Tivoli Storage Manager servers) Task

Table C-20 shows the quick paths for the server tasks.

Task	Path
Create	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the table, click Select Action, select Add Server Connection, and click Go.</li> </ol>
View and modify	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the table, select a server.</li> <li>Click Select Action, select Modify Server Connection, and click Go.</li> </ol>

Table C-20 Add or modify Server

#### Server group

Table C-21 shows the quick paths for the server group.

Table C-21	Server aroup
	ociver group

Task	Path
Create	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the servers and server groups portlet, click Server Groups.</li> <li>In the Server Groups table, click Select Action, select Create a Server Group, and click Go.</li> </ol>
View and modify	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the servers and server groups portlet, click Server Groups.</li> <li>In the Server Groups table, select a server group.</li> <li>Click Select Action, select Modify a Server Group, and click Go.</li> </ol>

#### Server script

Table C-22 shows the quick paths for the server script.

Table C-22	Server script
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Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Scripts tab.</li> <li>In the table, click Select Action, select Create Script, and click Go.</li> <li>To get help in creating a script that performs key maintenance tasks:         <ol> <li>Click Server Maintenance in the Work Items list.</li> <li>In the table, click Select Action, select Create a Maintenance Script, and click Go.</li> </ol> </li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, click a server name.</li> <li>In the server's properties portlet, click the Scripts tab.</li> <li>In the table, select a script.</li> <li>Click Select Action, select Modify Script, and click Go.</li> <li>To modify a maintenance script:         <ol> <li>Click Server Maintenance in the Work Items list.</li> <li>In the table, select a maintenance script.</li> <li>Click Select Action, select Modify Maintenance Script, and click Go.</li> </ol> </li> </ol>

#### Storage pool

Table C-23 shows the quick paths for the storage pool.

Task	Path
Create	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's storage pools portlet, click Select Action, select Create a Storage Pool, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's storage pools portlet, select a storage pool.</li> <li>Click Select Action, select Modify Storage Pool, and click Go.</li> </ol>

#### Subscription to a profile (for a managed server)

Table C-24 shows the quick paths for the subscription to a profile.

	Table C-24	Subscription to a profile
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Task	Path
Create	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a managed server.</li> <li>In the server's Subscriptions table, click Select Action, select Create Subscription, and click Go.</li> </ol>

#### Volumes in a library

Table C-25 shows the quick paths for volumes in a library.

Table C-25	Volumes in a library

Task	Path
Create (check in, or check in and label)	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Volumes tab.</li> <li>In the table, click Select Action, select Add Volumes, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Libraries for all Servers table, click a library name.</li> <li>In the library's properties portlet, click the Volumes tab.</li> <li>In the table, select a volume.</li> <li>Click Select Action, select Modify Volume, and click Go.</li> </ol>

#### Volumes in a storage pool

Table C-26 shows the quick paths for volumes in a storage pool.

Table C-26	Volumes in a storage pool
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Task	Path
Create (check in, or check in and label)	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's storage pools portlet, click a storage pool name.</li> <li>In the storage pool's properties notebook, click the Volumes tab.</li> <li>In the volumes table, click Select Action, select Add Volume, and click Go.</li> </ol>
View and modify	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's storage pools portlet, click a storage pool name.</li> <li>In the storage pool's properties notebook, click the Volumes tab.</li> <li>In the table, select a volume.</li> <li>Click Select Action, select Modify Volume or View Contents, and click Go.</li> </ol>

## D

### Administration Center Wizards

This appendix contains tables giving you information about the wizards in the Administration Center that help guide you through common configuration tasks.

#### **Enterprise management**

Table D-1 shows the descriptions and paths of the wizards concerning enterprise management.

Wizard	Description	Path
Set up enterprise configuration	Used to set up a configuration manager and managed servers. You must set up the configuration manager server before setting up its managed servers.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Set Up Enterprise Configuration, and click Go.</li> </ol>
Define a server	Used to enable server-to-server communications.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the Servers and Server Groups portlet, click Servers.</li> <li>In the Servers table, click Select Action, select Define Server, and click Go.</li> </ol>
Create a server group	Used to create a group of defined servers, which can be used to facilitate command routing.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the Servers and Server Groups portlet, click Server Groups.</li> <li>In the Server Groups table, click Select Action, select Create a Server Group, and click Go.</li> </ol>
Create a profile	Used to create new profiles for configuration manager servers.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server defined as a configuration manager.</li> <li>In the server's Profiles table, click Select Action, select Create Profile, and click Go.</li> </ol>
Create a subscription	Used to create new profile subscriptions for managed servers.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, click the name of a server defined as a managed server.</li> <li>In the server's Profiles table, click Select Action, select Create Subscription, and click Go.</li> </ol>

Table D-1 Enterprise management
Wizard	Description	Path
Import or export a server	Used to import or export server definitions.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select either Import Server or Export Server, and click Go.</li> </ol>
Create administrative schedule	Used to set up a schedule to perform administrative tasks.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Server Properties, and click Go.</li> <li>In the server's properties notebook, click the Administrative Schedules tab.</li> <li>In the Administrative Schedules table, click Select Action, select Create a Schedule, and click Go.</li> </ol>
Import or export administrator	Used to import or export administrator definitions.	<ol> <li>Click Enterprise Management in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Server Properties, and click Go.</li> <li>In the server's properties notebook, click the Administrators tab, select the name of the administrator, click Select Action, select either Import Administrator or Export Administrator and click Go.</li> </ol>

## Storage devices

Table D-2 shows the descriptions and paths of the wizards concerning storage devices.

Table D-2 Storage devices

Wizard	Description	Path
Add storage device	Used to create a library, drives, paths, a device class, and storage pools for a storage device.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Add a Storage Device, and click Go.</li> </ol>
Create a library	Provides a fast way to define a library and its drives.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Create Library, and click Go.</li> </ol>

Wizard	Description	Path
Create a device class	Used to create a device class, which represents a set of storage devices with similar characteristics.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Device Classes, and click Go.</li> <li>In the server's Device Classes table, click Select Action, select Create a Device Class, and click Go.</li> </ol>
Create a storage pool	Used to set up a primary or copy storage pool for use.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, and click Go.</li> <li>In the server's Storage Pools table, click Select Action, select Create a Storage Pool, and click Go.</li> </ol>
Protect a NAS file server	Used to create a complete configuration so that the server can back up a network-attached storage (NAS) file server using network data management protocol (NDMP).	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Data Movers, and click Go.</li> <li>In the server's Data Movers table, click Select Action, select Create NAS Data Mover, and click Go.</li> </ol>
Create a collocation group	Used to create a collocation group to store data for selected client nodes on as few volumes as possible.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, click View Collocation Groups, and click Go.</li> <li>In the server's Collocations Groups table, click Select Action, select Create Collocation Group, and click Go.</li> </ol>
Add volumes	Used to check volumes into the library inventory, and label them if necessary. Also used to label volumes without checking them in.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>In the Libraries for All Servers table, click the name of a library, select the Volumes tab.</li> <li>In the library Properties table, click Select Action, select Add Volumes, and click Go.</li> </ol>
Restore volumes	Used to restore all files on damaged volumes in a primary storage pool that was backed up to a copy storage pool.	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Storage Pools, click Go.</li> <li>In the server's Storage Pools table, select a storage pool.</li> <li>Click Select Action, select Restore Volumes, and click Go.</li> </ol>

Wizard	Description	Path
Delete volume history	Used to delete volume history file records that are no longer needed (for example, records for obsolete database backup volumes).	<ol> <li>Click Storage Devices in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select View Volume History, and click Go.</li> <li>In the Volume History table, select a volume.</li> <li>Click Select Action, select Delete Volume History, and click Go.</li> </ol>

## Policy domains and client nodes

Table D-3 shows the descriptions and paths of the wizards concerning policy domains and client nodes.

Table D-3 Policy domains and client nodes

Wizard	Description	Path
Create a client node	Used to create a client node.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, click Select Action, select Create a Client Node, and click Go.</li> </ol>
Create client node schedule	Used to set up a schedule for automating client node operations.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Node Schedules.</li> <li>In the Schedules table, click Select Action, select Create a Schedule, and click Go.</li> </ol>

Wizard	Description	Path
Create a management class	Used to create a new management class.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Management Classes.</li> <li>In the Management Classes table, click Select Action, select Create Management Class, and click Go.</li> </ol>
Create an option set	Used to create an option set, which allows you to centrally manage many client node processing options.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Option Sets.</li> <li>In the Option Sets table, click Select Action, select Create an Option Set, and click Go.</li> </ol>
Create a policy domain	Used to create a policy domain with a default management class.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click Select Action, select Create a Policy Domain, and click Go.</li> </ol>
Enable LAN-free data movement	Used to set up a Storage Agent so that it can move data on behalf of client nodes over a SAN directly to storage devices.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, select a client node.</li> <li>Click Select Action, select Enable LAN-free Data Movement, and click Go.</li> </ol>

Wizard	Description	Path
Generate a backup set	Used to create a point-in-time copy of a client node's data. The copy is created directly from server storage, so the data does not have to be transferred over the network to create the backup set.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, click the name of a client node.</li> <li>In the node's properties notebook, click the Backup Sets tab.</li> <li>In the Backup Sets table, click Select Action, select Generate Backup Set, and click Go.</li> </ol>
Import or export client node	Used to import or export client node definitions.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, select a client node.</li> <li>Click Select Action, select either Import Client Node or Export Client Node, and click Go.</li> </ol>
Import or export policy domain	Used to import or export policy domain definitions.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the Policy Domains table, select a domain.</li> <li>Click Select Action, select either Import Policy Domain or Export Policy Domain, and click Go.</li> </ol>
Restore by file name (NAS)	Used to restore files for a NAS file server by file name when a table of contents was created at the time of backup, or when you know the names of individual files to restore.	<ol> <li>Click Policy Domains and Client Nodes in the Work Items list.</li> <li>In the Servers table, click the name of a server.</li> <li>In the server's Policy Domains table, click the name of a domain.</li> <li>In the domain's properties portlet, click Client Nodes.</li> <li>In the Client Nodes table, click the name of a NAS client node.</li> <li>In the NAS client's Properties notebook, click the File Spaces tab.</li> <li>In the File Spaces table, click Select Action, select Restore by File Name, and click Go.</li> </ol>

## Server maintenance

Table D-4 shows the description and path of the wizard concerning server maintenance.

Table D-4 Server maintenance

Wizard	Description	Path
Create maintenance script	Used to create a maintenance script to automatically run the essential processes that protect the server database and storage pools. The script helps keep the server running well.	<ol> <li>Click Server Maintenance in the Work Items list.</li> <li>In the Servers table, select a server.</li> <li>Click Select Action, select Create maintenance script and click Go.</li> </ol>

# Е

## Frequently asked questions: Administration Center

This appendix contains frequently asked questions and answers about general information, installation, and use of the Administration Center.

**Note:** The Tivoli Storage Manager Server and the Administrations Center can be installed on the same machine. The Administration Center requires, at a minimum, 512 MB RAM in addition to the RAM required for the Tivoli Storage Manager Server.

For the latest recommendations on the Administration Center installation, use keyword TSMADMINCENTER when you visit:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

## **Basics**

Table E-1 answers some general questions to help introduce you to the Administration Center.

What is the Administration Center?	The Administration Center is a new Web-based interface for centrally configuring and managing IBM Tivoli Storage Manager Version 5.3 servers. This new task-oriented interface replaces the previous administrative Web interface. The Administration Center provides wizards to help guide you through common configuration tasks. Properties notebooks allow you to modify settings and perform advanced management tasks.
What are the key features of the Administration Center?	<ul> <li>You only need to log in once to access multiple Tivoli Storage Manager servers from a single interface. You can easily monitor the health of your storage environment. Regular status updates are provided for:</li> <li>Scheduled events</li> <li>The server database and recovery log (using rules based on best practices)</li> <li>Storage devices, including information about offline drives and paths, and mounted volumes.</li> <li>You can filter and sort storage objects, such as client nodes and library volumes.</li> <li>You can use wizards to more easily perform complex tasks, such as:</li> <li>Creating schedules to perform client node and administrative operations.</li> <li>Creating a server maintenance script to perform database and storage pool backup, migration, expiration, and reclamation.</li> <li>Configuring storage devices. A comprehensive wizard helps you create a library, add drives, check in media volumes, and create storage pools.</li> </ul>
What is the IBM Integrated Solutions Console?	The Integrated Solutions Console, or ISC, is a component framework that allows you to install components provided by multiple IBM applications, and access them from a single Web interface. The Administration Center is installed as an Integrated Solutions Console component.

Table E-1 Basics of the Administration Center

Have other IBM applications been enabled for use in the Integrated Solutions Console?	Several IBM applications provide components that can be installed in the Integrated Solutions Console, and more are being developed.
Do I need a separate Integrated Solutions Console instance for each Tivoli Storage Manager server?	No. The Administration Center is the only Tivoli Storage Manager interface that is currently using the Integrated Solutions Console. However, Web clients can be accessed from the Administration Center.
Can I still use the previous administrative Web interface?	The Administration Center replaces the administrative Web interface. The previous administrative Web interface cannot be used with Version 5.3 servers. Because the interface has been completely redesigned, you should expect to spend some time learning to use it. To assist you in this transition, a set of animated tutorials is provided in the Administration Center (just click <b>Getting Started</b> in the Work Items list). These tutorials are designed to help you learn how to navigate the Administration Center and perform basic tasks. You can obtain more information by searching the knowledge base for Tivoli Storage Manager from the ibm.com support Web site (http://www.ibm.com/support). For information about creating common Tivoli Storage Manager objects, use the search term TSMADMINCENTER. For information about performing common administrative tasks, use the search term 1193101.
Why was the administrative Web interface replaced?	The Administration Center was created in response to customer feedback. Extensive user interviews were conducted to develop an interface that better supports common configuration and administration tasks. Moving to the Integrated Solutions console provides a framework that will allow for further improvements in the future, as well as better integration with other IBM products.
Can I use the Administration Center to manage all of my Tivoli Storage Manager servers?	The Administration Center can only be used with Version 5.3 servers.
Can I use the Administration Center to manage my client nodes?	You can access the Web client interface from the Administration Center. If you have the appropriate level of administrative authority, you can use this interface to perform client node management tasks.

Do I need a separate license to use the Administration Center?	No. The base product license for the Tivoli Storage Manager server includes support for the Administration Center and the Integrated Solutions Console.
How is security handled for the Administration Center?	Security is provided, or can be enabled, for each component of the Administration Center system. To secure communications between the Web browser and the Administration Center, you can configure the Integrated Solutions Console to use Secure Sockets Layer (SSL). This provides certificate-based 128-bit encryption. Instructions for configuring SSL are provided in the Administrator's Guide. Note that if the Web browser and Administration Center are behind a firewall, this might not be necessary. The Integrated Solutions Console user credentials and Tivoli Storage Manager administrator credentials stored in the WebSphere database are fully encrypted. If the Administration Center is used to manage Tivoli Storage Manager servers across a network, communications between the Administration Center and Tivoli Storage Manager servers are secured using Data Encryption Standard (DES) encryption.
What are the basic steps for setting up the Administration Center?	<ol> <li>These are the basic steps:         <ol> <li>Install and start your Tivoli Storage Manager Version 5.3 servers. Give each server a unique name.</li> <li>Install the Integrated Solutions Console. During the installation process, create an Integrated Solutions Console user ID and password.</li> <li>Install the Administration Center on the same system as the Integrated Solutions Console.</li> <li>Log in to the Integrated Solutions Console using a Web browser.</li> </ol> </li> <li>Add connections for the Tivoli Storage Manager servers you want to manage.</li> <li>Create additional Integrated Solutions Console user IDs and passwords for any other administrators who will access the Administration Center.</li> <li>For details, see the Tivoli Storage Manager Installation Guide and the Getting Started work item in the Administration Center.</li> </ol>

## Installation

Table E-2 answers some common questions you may have about installing the Administration Center.

Where should I install the Integrated Solutions Console? Do I need a dedicated machine?	The Integrated Solutions Console (along with the Administration Center) can be installed on the same system as a Tivoli Storage Manager server if the system meets the combined requirements for both applications. See the Installation Guide for detailed system requirements. If you plan to use the Administration Center to manage an environment with a large number of servers or administrators, consider installing the Administration Center on a separate system.
Which operating systems are supported for the Administration Center?	<ul> <li>The following operating systems are supported:</li> <li>AIX 5.1 or 5.2</li> <li>Sun Solaris 8</li> <li>SuSE Linux Enterprise Server 8 Powered by</li> <li>United Linux 1.0 (for Intel only)</li> <li>Red Hat Linux Advanced Server 2.1 (for Intel only)</li> <li>Windows 2000 Server and Advanced Server</li> <li>Windows Server 2003</li> </ul>
	For the most current information about Administration Center requirements, see the Tivoli Storage Manager Version 5.3 page of the support Web site: http://www.ibm.com/software/sysmgmt/products /support/IBMTivoliStorageManagerVersionRelea se.html

Table E-2 Installation of the Administration Center

What are the basic installation requirements?	<ul> <li>At least 512 MB of physical memory is suggested. The installation process requires 982 MB of available disk space, and an additional 679 MB of available space in the system temporary directory. After the Administration Center is installed, it occupies approximately 500 MB of disk space.If you are installing the Administration Center and a Tivoli Storage Manager server on the same system, the system must meet the combined minimum requirements for both applications. To estimate the minimum amount of memory needed to run both applications, add the following values:</li> <li>For the Administration Center: 512 MB</li> <li>For the Tivoli Storage Manager server: 32 MB + (the value specified for the BUFPOOLSIZE server option, in MB) + (1 MB x the number specified by the MAXSESSIONS server</li> </ul>
	operating system and any other applications, should also be factored into the total. For example, if you are using the default values for Tivoli Storage Manager and your operating system requires 256 MB, you would perform the following calculation:
	<ul> <li>89 MB for the Tivoli Storage Manager server (32 + 32 + 25)</li> <li>256 MB for the operating system</li> </ul>
	857 MB total
	requirements.
Do I have to use the wizard-based installation for the Administration Center?	No. In addition to the standard InstallShield wizard-based installation, command-based and silent installation options are also available. See the README.INSTALL file for instructions.
How long does the installation process take?	Installing the Integrated Solutions Console and Administration Center takes approximately 25 to 50 minutes, depending on processor speed. See the README.INSTALL file for more information.

Do I need to install or manage any additional components to use the Administration Center?	No. Although some of the underlying components of the Integrated Solutions Console are provided by WebSphere, you do not need to separately install or manage these components. You only need to manage the Administration Center itself, and to a lesser degree, the Integrated Solutions Console.

### **Using the Administration Center**

Table E-3 answers some questions to help get you started using the Administration Center.

Where do I start? After you log in to the Integrated Solutions Console, expand the Tivoli Storage Manager folder in the Work Items list and click Getting Started. The Tivoli Storage Manager welcome page is displayed. This page provides instructions, as well as animated tutorials designed to help you learn how to navigate the Administration Center and perform basic administrative How do I... The help for the Administration Center includes topics about how to create common Tivoli Storage Manager objects and perform common administrative tasks. You can obtain current information about these topics by searching the knowledge base for Tivoli Storage Manager from the ibm.com support Web site: http://www.ibm.com/support For current information about how to perform common administrative tasks, use the search term TSMADMINCENTER. Where is the command line? The command-line interface is available from all of the main server tables in the Administration Center. To access the command line, select a server, click Select Action, select Use Command Line, and click Go.

Table E-3 Using the Administration Center

Why aren't policy sets visible for policy domains?	To simplify the process of configuring and managing policy, the Administration Center does not expose policy sets. Instead, you always work with the active policy set. Any changes that you make to management classes are immediately activated, without additional effort on your part.
What's the difference between a Tivoli Storage Manager administrator name and an Integrated Solutions Console user ID?	When you install the Integrated Solutions Console, you are prompted to create a user ID and password. These credentials allow you to log in to the Integrated Solutions Console and access the Administration Center. In the Administration Center, Tivoli Storage Manager administrator credentials are only used when adding server connections. After server connections have been added, you can access all of these servers by logging in to the Integrated Solutions Console.
How do Tivoli Storage Manager administrators register to use the Administration Center?	As a best practice, create a separate Integrated Solutions Console user ID for each Tivoli Storage Manager administrator. If you add a new user ID to the TSM_AdminCenter group, the administrator will have access to all Administration Center functions, but will not be authorized to add other users to the Integrated Solutions Console. After logging in to the Integrated Solutions Console, each administrator must use their own Tivoli Storage Manager administrator credentials to add connections for the servers they will manage. In effect, this provides each administrator with a custom interface, which contains only the servers for which they have authority, and allows them to perform only the tasks allowed by their privilege class.
Can all Tivoli Storage Manager administrators use the Administration Center, regardless of their privilege class?	Yes. Any administrator with an Integrated Solutions Console user ID can log in and use their Tivoli Storage Manager administrator credentials to add connections for the servers they manage. The administrator credentials used to add a server connection determine the privilege class that will apply for the tasks performed on that server. As a best practice, create a separate Integrated Solutions Console user ID for each Tivoli Storage Manager administrator.

Why does the Administration Center require unique Tivoli Storage Manager server names?	<ul> <li>Using unique names for your Tivoli Storage Manager servers is a best practice. The Administration Center enforces this practice for the following reasons:</li> <li>Several Administration Center features rely on server-to-server communications, which requires unique server names.</li> <li>Because the Administration Center allows you to work with multiple servers from a single interface, using unique names helps to avoid confusion.</li> </ul>
How do I change the Integrated Solutions Console timeout?	By default, users are logged out of the Integrated Solutions Console after 30 minutes of inactivity. You can use the Administration Center Support Utility to adjust the timeout period. This utility, named supportUtil, is available in one of the following directories: [ISC root]\Tivoli\dsm\bin\ (Windows) [ISC root]\Tivoli\dsm\bin (UNIX and Linux) To start the utility, issue the following command: supportUtil.bat (Windows) supportUtil.sh (UNIX and Linux)
Are there any Tivoli Storage Manager functions not currently supported by the Administration Center?	The Administration Center supports most of the functions provided by the current product version. However, there are some exceptions. For example, Disaster Recovery Management is not currently supported, and must be configured and managed using the command-line interface. You can obtain a list of functions not currently supported by the Administration Center by searching the knowledge base for Tivoli Storage Manager from the ibm.com support Web site: http://www.ibm.com/support

To use the health monitor, do I need to configure it for each of my Tivoli Storage Manager servers?	When you install a Tivoli Storage Manager Version 5.3 server, an administrator named ADMIN_CENTER with the password ADMIN_CENTER is automatically created. The health monitor uses this administrator to access the server and obtain health information. Before you can use the health monitor, it must be configured. This consists of setting the default password for the ADMIN_CENTER administrator and optionally adjusting the health monitor refresh interval. This configuration only needs to be done once, regardless of the number of administrators and server connections you add. The new password you specify will be applied to all of the servers that are connected to the Administration Center. By default, the ADMIN_CENTER administrator is locked. For each server connection you add, you can specify whether to unlock the ADMIN_CENTER administrator to enable health monitoring.
Can I run the Administration Center as a Windows service?	Yes. When you install the Administration Center on a Windows system, it is automatically installed as a service.
How can I best optimize performance of the Administration Center?	For performance information, search the knowledge base for Tivoli Storage Manager from the IBM support Web site: http://www.ibm.com/support Use the search term 1193443.
How do I back up the Integrated Solutions Console?	Currently, you must back up the Integrated Solutions Console root directory to ensure that the credential information stored in its database is protected. If this credential information is lost and cannot be restored, you will have to recreate any server connections and Integrated Solutions Console user IDs you have created.
How does the Administration Center handle scheduling across time zones?	Any client node or administrative schedules you create will run according to the time used by the Tivoli Storage Manager server. If the Integrated Solutions Console machine or the machine running the Web browser is located in a different time zone, you will need to take the time difference into account when creating schedules.

## Troubleshooting and additional information

Table E-4 includes information about troubleshooting problems and finding additional resources.

How do I diagnose and resolve Administration Center issues?	Informational messages are provided for most errors that occur in the Administration Center. These messages typically provide a recommended action to help you resolve the error. In some cases, additional information from the server is also provided. If you are unable to resolve an error, see the Administration Center section of the Problem Determination Guide, which is available from the Tivoli Storage Manager publications Web site at: http://publib.boulder.ibm.com/infocenter/tiv ihelp/index.jsp
Is there documentation available for using the Administration Center?	Installation information is provided in the Tivoli Storage Manager Installation Guide, which is shipped with the product. General information about using the Administration Center is provided in the Tivoli Storage Manager Administrators Guide, which is available on the publications CD. Online help is also available. For context-specific help, click the •?• icon in any work page or portlet. For concept and task help, as well as information about using the Integrated Solutions Console, click the •Help• link at the upper right corner of the console.
Where can I get the latest Administration Center information?	For the latest information, including known issues, see the Administration Center readme file. The most current version of this readme file is available from the Tivoli Storage Manager Version 5.3 page of the support Web site: http://www.ibm.com/software/sysmgmt/products /support/IBMTivoliStorageManagerVersionRelea se.html

Table E-4 Troubleshooting and additional information



# F

# Tables of the changes and enhancements by versions

This appendix contains tables giving you an overview of the changes or enhancement for a given version.

### **Client versions**

The following sections provide an overview of changes for IBM Tivoli Storage Manager Client listed by version.

#### Table of Version 5.1.5 TSM Client enhancements

S W Changes Α H. Ν Μ L Enhanced domain processing х Х х х Х х Enhanced query backup and query archive commands х х х Х х Х New backup-archive option to preserve last access date of files х Х Х Х х x Support for a globally unique identifier (GUID) х х х Х 64-bit support for the Storage Manager HP-UX client х Linux86 client support for the General Parallel File System (GPFS) Х LAN-free data movement support on linux86 client х Storage Agent 5.1 (October 2002) - for Linux!!! Х Support for excluding specific system objects from backup processing х Enhanced image backup and restore processing (Windows 2000 only) х Ignore NTFS compression attribute х Support for DBCS installation path on Unicode-enabled clients х Support for monitoring or cancelling server-free operations (Windows х 2000) Support for Novell Cluster Services х No changes introduced in 5.1.5 to the Mac OS X N/A

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

#### Table of Version 5.2 TSM Client enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

Changes	Α	Н	L	S	W	Ν	М
Enhanced firewall security	х	х	х	х	х	х	
Enhancements for command line image restore operations	х	x	х	х	x		

Changes	Α	Н	L	S	w	Ν	М
Enhancements for the query filespace command	х	х	х	х	х		
Enhancements to the Web client interface	х	х	х	х	х	х	
NDMP file-level restore	x	х	х	х	х		
Separately installable language packs available	x	x	х	х	х		
Support for an external snapshot provider in the backup-archive clients	х	x	х	х	x	х	
Support for backing up files from one or more file space origins	x	х	х	x	х	х	
Support for backup and restore of the WebSphere Application Server (WAS)	x	x	x	x	x		
Support for displaying options and their settings via the command line	x	x	x	х	x	x	
Support for gathering Tivoli Storage Manager system information	x	x	x	x	х		
Support for processing EMC Celerra Network Attached Storage (NAS) file system images	x	-	J	x	х		
Veritas file systems, ACLs, and Veritas Volume Manager support on AIX (32-bit and 64-bit) clients	x	-	-	-			
Automounter support for Linux86 and Linux390 clients			х				
Open file support for backup and archive operations on Windows 2000 and Windows XP					x		
Support for Microsoft Automated System Recovery (ASR) on Windows Server 2003 and Windows XP					х		
Support for Microsoft Volume Shadowcopy Service (VSS) on Windows Server 2003					х		
Tivoli Storage Manager command line and GUI display actual image size stored on Tivoli Storage Manager server					х		
Enhanced ALL-LOCAL domain processing [NDS replica]						х	
Autofsrename							х
Inclexcl							х
Migrating to the Unicode-enabled client							х

#### Table of Version 5.2.2 TSM Client enhancements

Changes	Α	Н	L	S	W	Ν	М
Language support expanded to include Russian, Hungarian, Polish, and Czech	x	x	x	x	x		
Multi-session backup session enhancements	x	x	x	х	х	х	х
Removal of operand limits for backup and archive operations	x	X	х	x			х
Support for WebSphere Application Server (WAS) security	x	-	x	x	x		
Support for controlling symbolic link processing	x	x	х	x			
Backup and restore support for IBM TotalStorage SAN File System	x						
Tivoli Storage Manager backup-archive client Linux on iSeries			x				
Tivoli Storage Manager backup-archive client for Linux on Intel Itanium			х				
Support for Veritas Cluster Server cluster environment					х		
Backup and restore support for IBM TotalStorage SAN File System [Win2000 Client]					x		
Support for Novell NetWare 6.5 operating system						х	
Enhanced firewall security							х
Support for a Tivoli Storage Manager command line interface							х
Support for a Tivoli Storage Manager administrative client							х
Support for controlling symbolic link and alias processing							х
Support for displaying options and their settings via the command line [avail. since 5.1.5 for all others]							х
Support for encrypting data during backup or archive operation							х
Support for gathering Tivoli Storage Manager system information [avail. since 5.1.5 for all others]							х
Support for non-administrators to use Tivoli Storage Manager to manage their own data							x
Support for Tivoli Storage Manager as a background scheduler							x

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

#### Table of Version 5.3 TSM Client enhancements

Changes	Α	н	L	S	w	Ν	М
Dynamic client tracing	х	x	х	х	x		N/A
Enhanced encryption	х	x	x	х	x		N/A
Enhancements to query schedule command	х	х	x	x	x	х	N/A
Include-exclude enhancements	х	х	x	x	x	х	N/A
New links from the backup-archive client Java GUI to the Tivoli Storage Manager and Tivoli Home Pages	x	x	×	x	x		N/A
New options, Errorlogmax and Schedlogmax, and DSM_LOG environment variable changes	×	x	x	x	x		N/A
Optimized option default values	x	х	х	x	x	x	N/A
Support for deleting individual backups from a server file space	x	x	х	x	x	х	N/A
Tivoli Storage Manager Administration Center	×	x	х	х	x	х	N/A
Web client enhancements (and Java GUI in UNIX)	×	х	х	х	х	х	N/A
Client node proxy support [asnodename]	x	x	х	х			N/A
Tivoli Storage Manager backup-archive client for HP-UX Itanium 2		х					N/A
Linux for zSeries offline image backup			х				N/A
Journal based backup enhancements					x		N/A
Single drive support for Open File Support (OFS) for online image backups					x		N/A
New options, Errorlogmax and Schedlogmax						х	N/A

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

#### Server versions

The following sections will provide an overview of changes for IBM Tivoli Storage Manager Server listed by version.

#### Table of Version 5.1.5 TSM TSM Server enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	Α	Η	L	S	W	0	Z
Additional O/S platform support			х			х	

#### Table of Version 5.2 TSM TSM Server enhancements

Changes	Α	н	L	s	w	0	z
Accurate SAN Device Mapping	x	x	x	х	x		
Device Driver for Windows Server 2003					x		
IBM Device Driver for 3570, 3590, and IBM LTO Devices					х		
Increased Archive Retention Limits	x	х	х	х	х	x	х
Licensing changes	x	х	х	х	х	х	х
Linux for pSeries			х				
Linux for zSeries			х				
Macintosh OS X Unicode Support for Backup-Archive Client	х	х	х	х	х	х	х
Move Data by Node	х	х	х	х	х	х	х
Product Packaging & Name Changes	х	х	х	х	х	х	х
Server Performance Tuning TXNGROUPMAX	х	х	х	х	х	х	х
Server to Server Export and Import	х	х		х	х		х
Security Firewall Support	х	х	х	х	х	х	х
StorageTek VolSafe Support	х	х	х	х	х		
Support for SCSI Libraries with Multiple Drive Types	х	х	х	х	х		х
Support for Simultaneous Writes to Primary and Copy Storage Pools							х
TapeAlert Device Support	х	х	х	х	х		
Tape Autolabeling	х	х	х	х	х		

#### Table of Version 5.2.2 TSM Server enhancements

Changes	Α	Η	L	S	W	0	Ζ
Disaster Recovery Manager			х				
DVD support					х		
EMC Centera Support	x	x	х	х	x		
IBM 3592 Support	x	x	x	х	х	х	х
IBM Tivoli Storage Manager for Data Retention	x	x	х	x	x	х	х
NDMP Operations	x	x	x	х	x		
Operational Reporting	x	x	x	x	x	x	х
Sony AIT50 and AIT100 WORM Media Support	x	x	x	x	x		

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

#### **Table of Version 5.3 TSM Server enhancements**

Changes	Α	Н	L	S	w	0	Z
ACSLS Library Support Enhancements	х		х	х	х		
Accurate SAN Device Mapping	х		х	х			
Activity Log Management	х	x	х	х	х	х	х
Check-In and Check-Out Enhancements	х	х	х	х	х		
Collocation by Group	х	x	х	х	х	х	х
Communications Options			х		х		
Database Reorganization	х	х	х	х	х	х	х
Disk-only Backup	х	x	х	х	х	х	х
Enhancements for Server Migration and Reclamation Processes	х	x	х	х	х	х	х
IBM 3592 WORM Support	х	х	х	х	х	х	х
Improved Defaults	х	х	х	х	х	х	х
Increased Block Size for Writing to Tape					х		
LAN-free Environment Configuration	х	x	х	х	x	х	х

Changes	Α	Н	L	S	w	0	z
NDMP Operations	х	x	х	х	х		
Net Appliance SnapLock Support	х	x	х	х	x		
New Interface to Manage Servers: Administration Center	x	х	х	х	х	х	х
Server Processing Control in Scripts	x	x	х	х	x	х	х
Simultaneous Write Inheritance Improvements	х	x	x	х	x	х	x
Space Triggers for Mirrored Volumes	x	x	x	х	х	х	х
Storage Agent and Library Sharing Failover	x						
Support for Multiple Tivoli Storage Manager Client Nodes	х	x	x	х	x	x	х
Tivoli Storage Manager Scheduling Flexibility	x	x	x	X	x	x	х

## **Storage Agent versions**

The following sections will provide an overview of changes for IBM Tivoli Storage Manager Storage Agent listed by version.

#### Table of Version 5.1.5 Storage Agent enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	Α	Н	L	S	w	0	Ζ
Storage Agent for Linux was introduced			х				

#### Table of Version 5.2 Storage Agent enhancements

Changes	Α	Η	L	S	w	0	Ζ
Support for new Linux Platforms zSeries and pSeries			х				

#### Table of Version 5.2.2 Storage Agent enhancements

Changes	Α	Н	L	S	w	0	Z
TCPADMINPORT, TCPPORT and defaults	x	х	х	х	х		х
SHOW LANFREE	x	x	х	х	x		х
Storage Agent Compatibility and Support	х	x	х	х	х		х
Changed settings no longer require Storage Agent restart	x	x	x	x	x		х

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

#### Table of Version 5.3 Storage Agent enhancements

Changes	Α	Н	L	s	W	0	z
LAN-free Environment Configuration (VALIDATE LANFREE)	x	х	х	x	х		х
Considerations when using LAN free and simultaneous write	x	x	х	x	х		x
Multiple file system support for FILE device types	x	х	х	х	х		х
Multi-session No-Query Restore for LAN-free Path	x	х	х	х	х		х
LANFREETCPServeraddress	х	х	х	х	х		х
Shared Memory Protocol Support			х		х		
Supported Linux Platforms and Kernel Dependencies			х				
Shared Library Enhancement for z/OS							x



# G

## **Additional material**

This redbook refers to additional material that can be downloaded from the Internet as described below.

#### Locating the Web material

The Web material associated with this redbook is available in softcopy on the Internet from the IBM Redbooks Web server. Point your Web browser to:

ftp://www.redbooks.ibm.com/redbooks/SG246638

Alternatively, you can go to the IBM Redbooks Web site at:

ibm.com/redbooks

Select the **Additional materials** and open the directory that corresponds with the redbook form number, SG24-6638.

## Using the Web material

The additional Web material that accompanies this redbook includes the following files listed in Table G-1.

Table G-1 Additional material

File name	Description
IBM_Tivoli_Storage_Manager_V53_cmd_access.mov	This video shows how to access the command line using the new Administration Center.
IBM_Tivoli_Storage_Manager_V53_Unlock_Client_Node.mov	This video shows how to unlock a client node using the new Administration Center.
TivoliStorageManager53Tutorial.zip	This multi-media Macromedia Flash based tutorial provides an introduction to the new Administration Center.
corrections.zip	If it exists, this file contains updated information and corrections to the book.

#### Requirements for downloading the Web material

You should have a media player that is able to play .mov video files. In addition, you should have 25 MB of free disk space on your computer.

**Important:** The display quality depends on the video codec of your media player.

We accomplished excellent playback results for the mov files using Apples Quicktime player. To playback the mov Quicktime movies, please download the latest Quicktime player using the following Web site:

http://www.apple.com/quicktime/download/

The tutorials packed inside the TivoliStorageManager53Tutorial.zip file require MacroMedia Flash 6.0 or later. You can download the Flash player at:

http://www.macromedia.com/go/getflashplayer

#### How to use the Web material

Create a subdirectory (folder) on your workstation, and if applicable, unzip the contents of the Web material zip file into this folder.

## **Abbreviations and acronyms**

ABI	Application Binary Interface	CGI	Common Gateway Interface
ACE	Access Control Entries	CIFS	Common Internet File System
ACL	Access Control List	CIM	<b>Common Information Model</b>
AD	Microsoft Active Directory	CPI-C	Common Programming Interface for Communications
ADSM	ADSTAR Distributed Storage Manager	CPU	Central Processing Unit
AFS	Andrew File System	CSR	Client/server Runtime
AIX	Advanced Interactive eXecutive	DAC	Discretionary Access Controls
ANSI	American National Standards	DARPA	Defense Advanced Research Projects Agency
ΔΡΙ	Application Programming	DASD	Direct Access Storage Device
	Interface	DBM	Database Management
APPC	Advanced Program-to-Program	DCE	Distributed Computing Environment
APPN	Communication Advanced Peer-to-Peer	DCOM	Distributed Component Object Model
	Networking	DDE	Dynamic Data Exchange
ARPA	Advanced Research Projects Agency	DDNS	Dynamic Domain Name System
ASCII	American National Standard	DES	Data Encryption Standard
	Code for Information	DFS	Distributed File System
ASR	Automated System Recovery	DHCP	Dynamic Host Configuration
АТМ	Asynchronous Transfer Mode		Piolocol
BDC	Backup Domain Controller		Disaster REcovery Manager
BIND	Berkeley Internet Name		Directory Service Agent
	Domain		Domain Name Systemb
BSD	Berkeley Software	FFS	Encrypting File Systems
CA	Certification Authorities	EGID	Effective Group Identifier
CAL	Client Access License	EMS	Event Management Services
C-SPOC	Cluster single point of control	ERP	Enterprise Resources
CDE	Common Desktop		Planning
	Environment	ERRM	Event Response Resource Manager

ESCON	Enterprise System	I/O	Input/Output
	Connection	IP	Internet Protocol
ESP	Encapsulating Security	IPC	Interprocess Communication
FSS	Enterprise Storage Server	IPL	Initial Program Load
EUID	Effective Liser Identifier	IPsec	Internet Protocol Security
FAT	File Allocation Table	ISA	Industry Standard Architecture
FC	Fibre Channel	iSCSI	SCSI over IP
FDDIFEC	Fiber Distributed Data Interface	ISDN	Integrated Services Digital Network
FEC	Fast EtherChannel technology	ISNO	Interface-specific Network Options
FIFO	First In/First Out	ISO	International Standards
FQDN	Fully Qualified Domain Name		Organization
FSF	File Storage Facility	ISV	Independent Software
FTP	File Transfer Protocol	ITOO	vendor
FtDisk	Fault-Tolerant Disk	1150	Support Organization
GC	Global Catalog	JBOD	Just a Bunch of Disks
GDA	Global Directory Agent	JFS	Journaled File System
GDI	Graphical Device Interface	JVM	Java Virtual Machine
GDS	Global Directory Service	LAN	Local Area Network
GID	Group Identifier	LCN	Logical Cluster Number
GL	Graphics Library	LDAP	Lightweight Directory Access
GUI	Graphical User Interface		Protocol
НА	High Availability	LFS	Logical File System (AIX)
НАСМР	High Availability Cluster	LP	Logical Partition
ΗΔΙ	Hardware Abstraction Laver	LPC	Local Procedure Call
HBA	Host Bus Adapter	LUN	Logical Unit Number
HCI	Hardware Compatibility List	LVCB	Logical Volume Control Block
HSM	Hierarchical Storage	LVDD	Logical Volume Device Driver
	Management	LVM	Logical Volume Manager
НТТР	Hypertext Transfer Protocol	MBR	Master Boot Record
IBM	International Business	MDC	Meta Data Controller
	Machines Corporation	MDM	Multiple Device Manager
IDE	Integrated Drive Electronics	MFT	Master File Table
IDS	Intelligent Disk Subsystem	MIB	Management Information
IIS	Internet Information Server		Base

ММС	Microsoft Management	PHB	Per Hop Behavior
	Console	POSIX	Portable Operating System
MOCL	Managed Object Class Library		Interface for Computer Environment
MSCS	Microsoft Cluster Server	PP	Physical Partition
MSS	Modular Storage Server	PReP	PowerPC® Reference
MWC	Mirror Write Consistency	Dem	Plauolili Devoictant Storage Manager
NAS	Network Attached Storage	PSM	Persistent Storage Manager
NBC	Network Buffer Cache	PSN	Program Sector Number
NBPI	Number of Bytes per I-node	PV	Physical Volume
NDMP	Network Data Management	PVID	Physical Volume Identifier
	Protocol	QoS	Quality of Service
NFS	Network File System	RAID	Redundant Array of
NIM	Network Installation Management	RAS	Remote Access Service
NIS	Network Information System	RDBMS	Relational Database
NTFS	NT File System		Management System
NVRAM	Non-Volatile Random Access Memory	RISC	Reduced Instruction Set Computer
NetDDE	Network Dynamic Data Exchange	RMC	Resource Monitoring and Control
ODBC	Open Database Connectivity	RMSS	Reduced-Memory System
ODM	Object Data Manager		Simulator
ОМ	Object Manager	ROLTP	Relative OnLine Transaction Processing
OPAL	IBM Orchestration and	ROS	Read-Only Storage
	Provisioning Automation	RPC	Remote Procedure Call
os	Operating System	RSM	Removable Storage
OSF	Open Software Foundation	DOVD	Management
PAM	Pluggable Authentication	RSVP	Protocol
PCI	Peripheral Component	SAM	Security Account Manager
	Interconnect	SAN	Storage Area Network
PCMCIA	Personal Computer Memory Card International	SCSI	Small Computer System Interface
	Association	SDK	Software Developer's Kit
PDC	Primary Domain Controller	SFS	SAN File System
PDF	Portable Document Format	SID	Security Identifier
PFS	Physical File System	SMB	Server Message Block

SMIT	System Management	VPN	Virtual Private Network
CMD		VSM	Virtual System Management
SMP	Symmetric Multiprocessor	W3C	World Wide Web Consortium
SMS	Systems Management Server	WAN	Wide Area Network
SNA	Architecture	WLM	Workload Manager
SNMP	Simple Network Management Protocol	WWN WWW	World Wide Name World Wide Web
SP	System Parallel		
SQL	Structured Query Language		
SSA	Serial Storage Architecture		
SSL	Secure Sockets Layer		
SRM	Storage Resource Manager		
SVC	SAN Volume Controller		
TCP/IP	Transmission Control Protocol/Internet Protocol		
TDP	Tivoli Data Protection		
TEC	Tivoli Enterprise Console		
TOS	Type of Service		
TSM	IBM Tivoli Storage Manager		
UDB	Universal Database		
UDF	Universal Disk Format		
UFS	UNIX File System		
UID	User Identifier		
UNC	Universal Naming Convention		
UPS	Uninterruptable Power Supply		
URL	Universal Resource Locator		
VCN	Virtual Cluster Name		
VFS	Virtual File System		
VG	Volume Group		
VGDA	Volume Group Descriptor Area		
VGSA	Volume Group Status Area		
VGID	Volume Group Identifier		
VIPA	Virtual IP Address		
VP	Virtual Processor		
VPD	Vital Product Data		

## Glossary

## Α

**ACSLS** Automated Cartridge System Library Software; it functions as a central service provider for StorageTek library operations in heterogeneous environments. It allows you to collapse disparate, application-dedicated libraries to one centralized library or string of libraries accessed via a single point of control.

Agent A software entity that runs on endpoints and provides management capability for other hardware or software. An example is an SNMP agent. An agent has the ability to spawn other processes.

AL See arbitrated loop.

Allocated storage The space that is allocated to volumes, but not assigned.

Allocation The entire process of obtaining a volume and unit of external storage, and setting aside space on that storage for a data set.

**Arbitrated loop** A Fibre Channel interconnection technology that allows up to 126 participating node ports and one participating fabric port to communicate. See also Fibre Channel Arbitrated Loop and loop topology.

**Array** An arrangement of related disk drive modules that have been assigned to a group.

## В

**Bandwidth** A measure of the data transfer rate of a transmission channel.

**Bridge** Facilitates communication with LANs, SANs, and networks with dissimilar protocols.

## С

CIM Common Information Model.

**CIM agent** The code that is comprised of common building blocks that can be used instead of proprietary software or device-specific programming interfaces to manage CIM-compliant devices. A CIM agent is made up of the following components: agent code, a CIM object manager (CIMOM), client application device, device provider, and Service Location Protocol.

**CIM object manager (CIMOM)** The common conceptual framework for data management that receives, validates, and authenticates the CIM requests from the client application. It then directs the requests to the appropriate component or service provider.

**Client** A function that requests services from a server, and makes them available to the user. A term used in an environment to identify a machine that uses the resources of the network.

**Client application** A storage management program that initiates Common Information Model (CIM) requests to the CIM agent for the device. **Client authentication** The verification of a client in secure communications where the identity of a server or browser (client) with whom you wish to communicate is discovered. A sender's authenticity is demonstrated by the digital certificate issued to the sender.

**Client-server relationship** Any process that provides resources to other processes on a network is a server. Any process that employs these resources is a client. A machine can run client and server processes at the same time.

**Common Information Model (CIM)** A set of standards developed by the Distributed Management Task Force (DMTF). CIM provides a conceptual framework for storage management and an open approach to the design and implementation of storage systems, applications, databases, networks, and devices.

Console A user interface to a server.

**CSC** Client System Component (Term used in a STK ACSLS environment) It provides a seamless connection between backup applications and ACSLS Manager software.

**CSI** Client System Interface (Term used in a STK ACSLS environment) Interface to the CSC on an ACSLS server.

## D

**Data Center Model (DCM)** The IBM Tivoli Provisioning Manager data store and data schema. It includes a representation of all physical and logical assets.

**DB2 Universal Database** An IBM program product that helps leverage information by delivering the performance, scalability, reliability, and availability needed for the most demanding applications.

**Device driver** A program that enables a computer to communicate with a specific device, for example, a disk drive.

**Device Manager** One of three components that make up the IBM TotalStorage Multiple Device Manager. IBM TotalStorage Multiple Device Manager uses the Service Location Protocol (SLP) on the IBM Director to discover storage devices, creates managed objects to represent these discovered devices, and provides the user with access to device configuration functionality.

**Discovery** The process of finding resources within an enterprise, including finding the new location of monitored resources that were moved.

**Disk group** A set of disk drives that have been configured into one or more logical unit numbers. This term is used with RAID devices.

## Ε

**Enterprise network** A geographically dispersed network under the backing of one organization.

**ESS** See IBM TotalStorage Enterprise Storage Server.

**Event** In the Tivoli environment, any significant change in the state of a system resource, network resource, or network application. An event can be generated for a problem, for the resolution of a problem, or for the successful completion of a task. Examples of events are: the normal starting and s ping of a process, the abnormal termination of a process, and the malfunctioning of a server.
# F

**Fabric** The Fibre Channel employs a fabric to connect devices. A fabric can be as simple as a single cable connecting two devices. The term is often used to describe a more complex network utilizing hubs, switches, and gateways.

**FAStT Storage Server** A RAID controller device that contains Fibre Channel interfaces that connect the host systems and the disk drive enclosures. The FAStT Storage Server provides high system availability through use of hot-swappable and redundant components.

FC See Fibre Channel.

FCS See Fibre Channel standard.

**Fiber optic** The medium and the technology associated with the transmission of information along a glass or plastic wire or fiber.

**Fibre Channel** A technology for transmitting data between computer devices at a data rate of up to 1 Gb. It is especially suited for connecting computer servers to shared storage devices and for interconnecting storage controllers and drives.

**Fibre Channel Arbitrated Loop** A reference to the FC-AL standard, a shared gigabit media for up to 127 nodes, one of which can be attached to a switch fabric. See also arbitrated loop and loop topology. Refer to American National Standards Institute (ANSI) X3T11/93-275. **Fibre Channel standard** An ANSI standard for a computer peripheral interface. The I/O interface defines a protocol for communication over a serial interface that configures attached units to a communication fabric. Refer to ANSI X3.230-199x.

**File system** An individual file system on a host. This is the smallest unit that can monitor and extend. Policy values defined at this level override those that might be defined at higher levels.

## G

**Gateway** In the SAN environment, a gateway connects two or more different remote SANs with each other. A gateway can also be a server on which a gateway component runs.

# Н

Hardware zoning Hardware zoning is based on physical ports. The members of a zone are physical ports on the fabric switch. It can be implemented in the following configurations: one to one, one to many, and many to many.

**HBA** See host bus adapter.

**Host** Any system that has at least one internet address associated with it. A host with multiple network interfaces can have multiple internet addresses associated with it. This is also referred to as a server.

**Host bus adapter (HBA)** A Fibre Channel HBA connection that allows a workstation to attach to the SAN network.

**Hub** A Fibre Channel device that connects up to 126 nodes into a logical loop. All connected nodes share the bandwidth of this one logical loop. Hubs automatically recognize an active node and insert the node into the loop. A node that fails or is powered off is automatically removed from the loop.

# I

**IBM Director** A suite of tools and utilities that automates many of the processes required to manage systems, including capacity planning, asset tracking, preventive maintenance, diagnostic monitoring, and troubleshooting. It uses a graphical interface that provides easy access to both local and remote systems.

#### IBM TotalStorage Enterprise Storage

**Server (ESS)** Provides an intelligent disk storage subsystem for systems across the enterprise.

IP Internet protocol.

# J

Java A programming language that enables application developers to create object-oriented programs that are very secure, portable across different machine and operating system platforms, and dynamic enough to allow expandability.

Java plug-in A simple workflow that invokes only a single action. Java plug-ins provide workflow access to basic storage functions and can be combined into more complex workflows.

**Java runtime environment (JRE)** The underlying, invisible system on your computer that runs applets the browser passes to it. Java Virtual Machine (JVM) The execution environment within which Java programs run. The Java virtual machine is described by the Java Machine Specification which is published by Sun Microsystems. Because the Tivoli Kernel Services is based on Java, nearly all ORB and component functions execute in a Java virtual machine.

**JBOD** Just a Bunch Of Disks.

**JRE** See Java runtime environment.

JVM See Java Virtual Machine.

### L

**Logical device operation** A logical device operation (also logical operation) is an abstraction of an operation against a device in the Data Center Model.

**Logical unit number (LUN)** The LUNs are provided by the storage devices attached to the SAN. This number provides you with a volume identifier that is unique among all storage servers. The LUN is synonymous with a physical disk drive or a SCSI device. For disk subsystems such as the IBM Enterprise Storage Server, a LUN is a logical disk drive. This is a unit of storage on the SAN which is available for assignment or unassignment to a host server.

**Loop topology** In a loop topology, the available bandwidth is shared with all the nodes connected to the loop. If a node fails or is not powered on, the loop is out of operation. This can be corrected using a hub. A hub opens the loop when a new node is connected and closes it when a node disconnects. See also Fibre Channel Arbitrated Loop and arbitrated loop.

LUN See logical unit number.

**LUN assignment criteria** The combination of a set of LUN types, a minimum size, and a maximum size used for selecting a LUN for automatic assignment.

**LUN masking** This allows or blocks access to the storage devices on the SAN. Intelligent disk subsystems like the IBM Enterprise Storage Server provide this kind of masking.

# Μ

Managed object A managed resource.

**Managed resource** A physical element to be managed.

Management Information Base (MIB) A logical database residing in the managed system which defines a set of MIB objects. A MIB is considered a logical database because actual data is not stored in it, but rather provides a view of the data that can be accessed on a managed system.

MIB See Management Information Base.

**MIB object** A MIB object is a unit of managed information that specifically describes an aspect of a system. Examples are CPU utilization, software name, hardware type, and so on. A collection of related MIB objects is defined as a MIB.

# Ν

**Network topology** A physical arrangement of nodes and interconnecting communications links in networks based on application requirements and geographical distribution of users. **N\_Port node port** A Fibre Channel-defined hardware entity at the end of a link which provides the mechanisms necessary to transport information units to or from another node.

**NL\_Port node loop port** A node port that supports arbitrated loop devices.

**node** An addressable entity connected to an I/O bus or network. Used primarily to refer to computers, storage devices, and storage subsystems. The component of a node that connects to the bus or network is a port.

# 0

**Open system** A system whose characteristics comply with standards made available throughout the industry, and therefore can be connected to other systems that comply with the same standards.

### Ρ

**Point-to-point topology** It consists of a single connection between two nodes. All the bandwidth is dedicated for these two nodes.

**Port** An end point for communication between applications, generally referring to a logical connection. A port provides queues for sending and receiving data. Each port has a port number for identification. When the port number is combined with an Internet address, it is called a socket address. **Port zoning** In Fibre Channel environments, port zoning is the grouping together of multiple ports to form a virtual private storage network. Ports that are members of a group or zone can communicate with each other but are isolated from ports in other zones. See also LUN masking and subsystem masking.

**Protocol** The set of rules governing the operation of functional units of a communication system if communication is to take place. Protocols can determine low-level details of machine-to-machine interfaces, such as the order in which bits from a byte are sent. They can also determine high-level exchanges between application programs, such as file transfer.

# R

**RAID** Redundant array of inexpensive or independent disks. A method of configuring multiple disk drives in a storage subsystem for high availability and high performance.

# S

SAN See storage area network.

**SAN agent** A software program that communicates with the manager and controls the subagents. This component is largely platform independent. See also subagent.

**SCSI** Small Computer System Interface. An ANSI standard for a logical interface to computer peripherals and for a computer peripheral interface. The interface utilizes a SCSI logical protocol over an I/O interface that configures attached targets and initiators in a multi-drop bus topology.

**Server** A program running on a mainframe, workstation, or file server that provides shared services. This is also referred to as a host.

**Shared storage** Storage within a storage facility that is configured such that multiple homogeneous or divergent hosts can concurrently access the storage. The storage has a uniform appearance to all hosts. The host programs that access the storage must have a common model for the information on a storage device. You need to design the programs to handle the effects of concurrent access.

Simple Network Management Protocol (SNMP) A protocol designed to give a user the capability to remotely manage a computer network by polling and setting terminal values and monitoring network events.

**SMI-S** See Storage Management Initiative Specification.

**SNMP** See Simple Network Management Protocol.

**SNMP agent** An implementation of a network management application which is resident on a managed system. Each node that is to be monitored or managed by an SNMP manager in a TCP/IP network, must have an SNMP agent resident. The agent receives requests to either retrieve or modify management information by referencing MIB objects. MIB objects are referenced by the agent whenever a valid request from an SNMP manager is received.

**SNMP manager** A managing system that executes a managing application or suite of applications. These applications depend on MIB objects for information that resides on the managed system.

**SNMP trap** A message that is originated by an agent application to alert a managing application of the occurrence of an event.

**Software zoning** Is implemented within the Simple Name Server (SNS) running inside the fabric switch. When using software zoning, the members of the zone can be defined with: node WWN, port WWN, or physical port number. Usually the zoning software also allows you to create symbolic names for the zone members and for the zones themselves.

**SQL** Structured Query Language.

**Storage administrator** A person in the data processing center who is responsible for defining, implementing, and maintaining storage management policies.

**Storage area network (SAN)** A managed, high-speed network that enables any-to-any interconnection of heterogeneous servers and storage systems.

### **Storage Management Initiative**

**Specification (SMI-S)** A design specification developed by the Storage Networking Industry Association (SNIA) that specifies a secure and reliable interface that allows storage management systems to identify, classify, monitor, and control physical and logical resources in a storage area network. The interface is intended as a solution that integrates the various devices to be managed in a storage area network (SAN) and the tools used to manage them.

**storage pool** A collection of storage resources on a storage area network (SAN) that have been set aside for a particular purpose.

**Subagent** A software component of SAN products which provides the actual remote query and control function, such as gathering

host information and communicating with other components. This component is platform dependent. See also SAN agent.

**Subsystem masking** The support provided by intelligent disk storage subsystems like the Enterprise Storage Server. See also LUN masking and port zoning.

**Switch** A component with multiple entry and exit points or ports that provide dynamic connection between any two of these points.

**Switch topology** A switch allows multiple concurrent connections between nodes. There can be two types of switches, circuit switches and frame switches. Circuit switches establish a dedicated connection between two nodes. Frame switches route frames between nodes and establish the connection only when needed. A switch can handle all protocols.

T

TCP See Transmission Control Protocol.

**TCP/IP** Transmission Control Protocol/Internet Protocol.

**Topology** The physical and logical arrangement of devices in a storage area network (SAN). Topology can be displayed graphically, showing devices and their interconnections.

**Transmission Control Protocol (TCP)** A reliable, full duplex, connection-oriented, end-to-end transport protocol running on of IP.

W

WAN Wide Area Network.

**workflow** A sequenced set of operations that can be large and complex, or can be as simple as a single command. A workflow itself can be included as a step in other workflows.

# Ζ

**zone** A segment of a storage area network (SAN) fabric composed of selected storage devices nodes and server nodes. Only the members of a zone have access to one another.

zone member A device in a zone.

**zone set** A group of zones that function together on the fabric. All devices in a zone see only devices assigned to that zone, but any device in that zone can be a member of other zones in the zone set.

**Zoning** In Fibre Channel environments, zoning allows for finer segmentation of the switched fabric. Zoning can be used to instigate a barrier between different environments. Ports that are members of a zone can communicate with each other but are isolated from ports in other zones. Zoning can be implemented in two ways: hardware zoning and software zoning.

# **Other glossaries:**

For more information on IBM terminology, see the IBM Storage Glossary of Terms at:

http://www.storage.ibm.com/glossary.htm

For more information on Tivoli terminology, see the Tivoli Glossary at:

http://publib.boulder.ibm.com/tividd/glossary
/tivoliglossarymst.htm

# **Related publications**

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

### **IBM Redbooks**

For information on ordering these publications, see "How to get IBM Redbooks" on page 410. Note that some of the documents referenced here may be available in softcopy only.

### Redbooks

- ► IBM Tivoli Storage Management Concepts, SG24-4877-03.
- ► IBM Tivoli Storage Manager Implementation Guide, SG24-5416-02.
- Tivoli Storage Manager Version 5.1 Technical Guide, SG24-6554-00
- Tivoli Storage Manager Version 4.2 Technical Guide, SG24-6277-00
- Tivoli Storage Manager Version 3.7.3 & 4.1: Technical Guide, SG24-6110-00
- ADSM Version 3 Technical Guide, SG24-2236-01
- ► Tivoli Storage Manager Version 3.7: Technical Guide, SG24-5477-00
- Understanding the IBM TotalStorage Open Software Family, SG24-7098-00.
- Exploring Storage Management Efficiencies and Provisioning -Understanding IBM TotalStorage Productivity Center and IBM TotalStorage Productivity Center with Advanced Provisioning, SG24-6373-00.

#### Redpaper

 Integrating IBM Tivoli Storage Manager Operational Reporting with Event Management, REDP-3850-00

#### Tips

- Technote: 3592 Media Types, TIPS0419
- Technote: VMware Backup Considerations with IBM Tivoli Storage Manager, TIPS0398

### **Other publications**

These publications are also relevant as further information sources:

### Tivoli Storage Manager V5.3 Administrator's Guides

- TSM V5.3 for HP-UX Administrator's Guide, GC32-0772-03
- ► TSM V5.3 for Windows Administrator's Guide, GC32-0782-03
- TSM V5.3 for Sun Solaris Administrator's Guide, GC32-0778-03
- TSM V5.3 for Linux Administrator's Guide, GC23-4690-03
- ► TSM V5.3 for z/OS Administrator's Guide, GC32-0775-03
- TSM V5.3 for AIX Administrator's Guide, GC32-0768-03

### Tivoli Storage Manager V5.3 Administrator's References

- ► TSM V5.3 for HP-UX Administrator's Reference, GC32-0773-03
- TSM V5.3 for Sun Administrator's Reference, GC32-0779-03
- ► TSM V5.3 for AIX Administrator's Reference, GC32-0769-03
- ► TSM V5.3 for z/OS Administrator's Reference, GC32-0776-03
- TSM V5.3 for Linux Administrator's Reference, GC23-4691-03
- ► TSM V5.3 for Windows Administrator's Reference, GC32-0783-03

### **Tivoli Storage Manager V5.3 Data Protection Publications**

- ► ITSM for Mail 5.3: Data Protection for Lotus Domino for UNIX, Linux, and OS/400 Installation and User's Guide, SC32-9056-02
- ITSM for Mail 5.3: Data Protection for Lotus Domino for Windows Installation and User's Guide, SC32-9057-01

### Tivoli Storage Manager V5.3 Install Guide

- TSM V5.3 for AIX Installation Guide, GC32-1597-00
- ► TSM V5.3 for Sun Solaris Installation Guide, GC32-1601-00
- ► TSM V5.3 for Linux Installation Guide, GC32-1599-00
- ► TSM V5.3 for z/OS Installation Guide, GC32-1603-00
- ► TSM V5.3 for Windows Installation Guide, GC32-1602-00
- ► TSM V5.3 for HP-UX Installation Guide, GC32-1598-00

### Tivoli Storage Manager V5.3 Messages

► TSM V5.3 Messages, SC32-9090-02

### Tivoli Storage Manager V5.3 Performance Tuning Guide

► TSM V5.3 Performance Tuning Guide, SC32-9101-02

### Tivoli Storage Manager V5.3 Read This First

• *TSM V5.3 Read This First*, GI11-0866-06

### Tivoli Storage Manager V5.3 Storage Agent User's Guides

- ► TSM V5.3 for SAN for AIX Storage Agent User's Guide, GC32-0771-03
- ► TSM V5.3 for SAN for HP-UX Storage Agent User's Guide, GC32-0727-03
- ► TSM V5.3 for SAN for Linux Storage Agent User's Guide, GC23-4693-03
- TSM V5.3 for SAN for Sun Solaris Storage Agent User's Guide, GCGC32-0781-03
- ► TSM V5.3 for SAN for Windows Storage Agent User's Guide, GC32-0785-03

### Tivoli Storage Manager V5.3.0 Backup-Archive Clients

- ► TSM 5.3 Using the Application Program Interface, GC32-0793-03
- TSM 5.3 NetWare Backup-Archive Clients Installation and User's Guide, GC32-0786-05
- ► TSM 5.3 UNIX and Linux Backup-Archive Clients Installation and User's Guide, GC32-0789-05
- TSM 5.3 Windows Backup-Archive Client Installation and User's Guide, GC32-0788-05
- TSM 5.3 for Space Management for UNIX and Linux User's Guide, GC32-0794-03

### **Online resources**

These Web sites and URLs are also relevant as further information sources:

- IBM Tivoli Storage Manager product page: http://www.ibm.com/software/tivoli/products/storage-mgr/
- IBM Tivoli Storage Manager information center: http://publib.boulder.ibm.com/infocenter/tivihelp/index.jsp
- IBM Tivoli Storage Manager product support: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html
- ► IBM Tivoli Support:

http://www.ibm.com/software/sysmgmt/products/support

► IBM Tivoli Support - Tivoli support lifecycle:

http://www.ibm.com/software/sysmgmt/products/support/eos.html

- IBM Software Support Lifecycle Tivoli Product lifecycle dates: http://www.ibm.com/software/info/supportlifecycle/list/t.html
- Tivoli Support IBM Tivoli Storage Manager Supported Devices for AIX HPUX SUN WIN:

http://www.ibm.com/software/sysmgmt/products/support/IBM\_TSM\_Supported\_Devi
ces\_for\_AIXHPSUNWIN.html

► Tivoli Support - IBM Tivoli Storage Manager Version Release Information:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager VersionRelease.html

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**IBM Tivoli Storage Manager Version 5.3 Technical Guide** 



# IBM Tivoli Storage Manager Version 5.3 Technical Guide



Understand and use the new Administration Center This IBM Redbook presents an overview of IBM Tivoli Storage Manager Version 5.3, giving detailed descriptions of the changes provided in this new release. This book also covers the cumulative changes in the releases after Version 5.1.

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