Tivoli software

IBM

IBM Tivoli Storage Manager Version 5.3 Technical Guide

- Understand and use the new Administration Center
- Learn about enhancements and new functions
- Covering Versions 5.1.5, 5.2.x, and 5.3

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International Technical Support Organization

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.
The *IBM Tivoli Storage Manager Administrator's Reference 5.2/5.2.2* have been published April 2003/January 2004.
The *IBM Tivoli Storage Manager Administrator's Guide 5.2/5.2.2* have been published April 2003/December 2004.

The team that wrote this redbook

This redbook was produced by a team of specialists from around the world working at the International Technical Support Organization, San Jose Center.

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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.

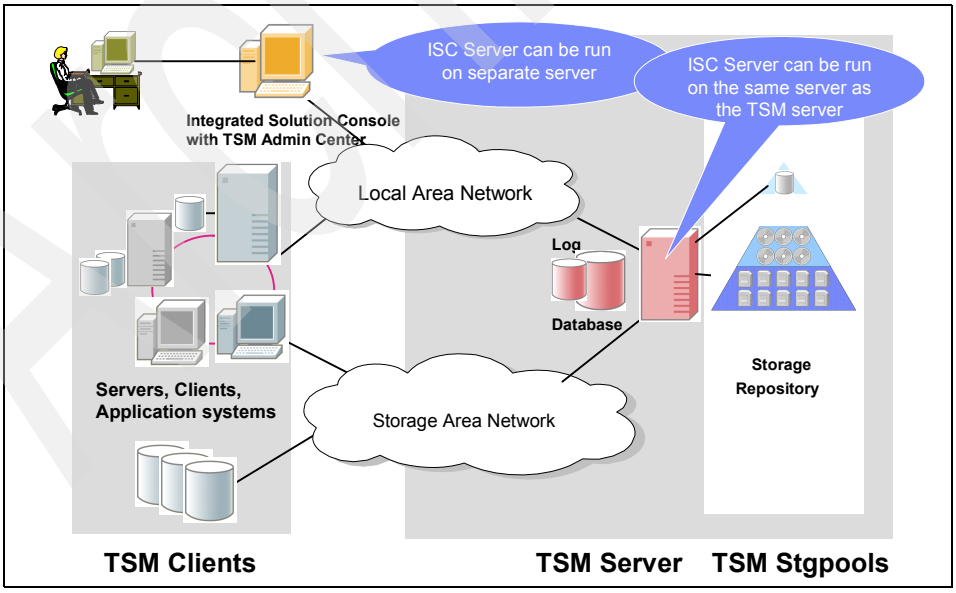

Figure 1-1 How the product components interrelate in version 5.3

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.

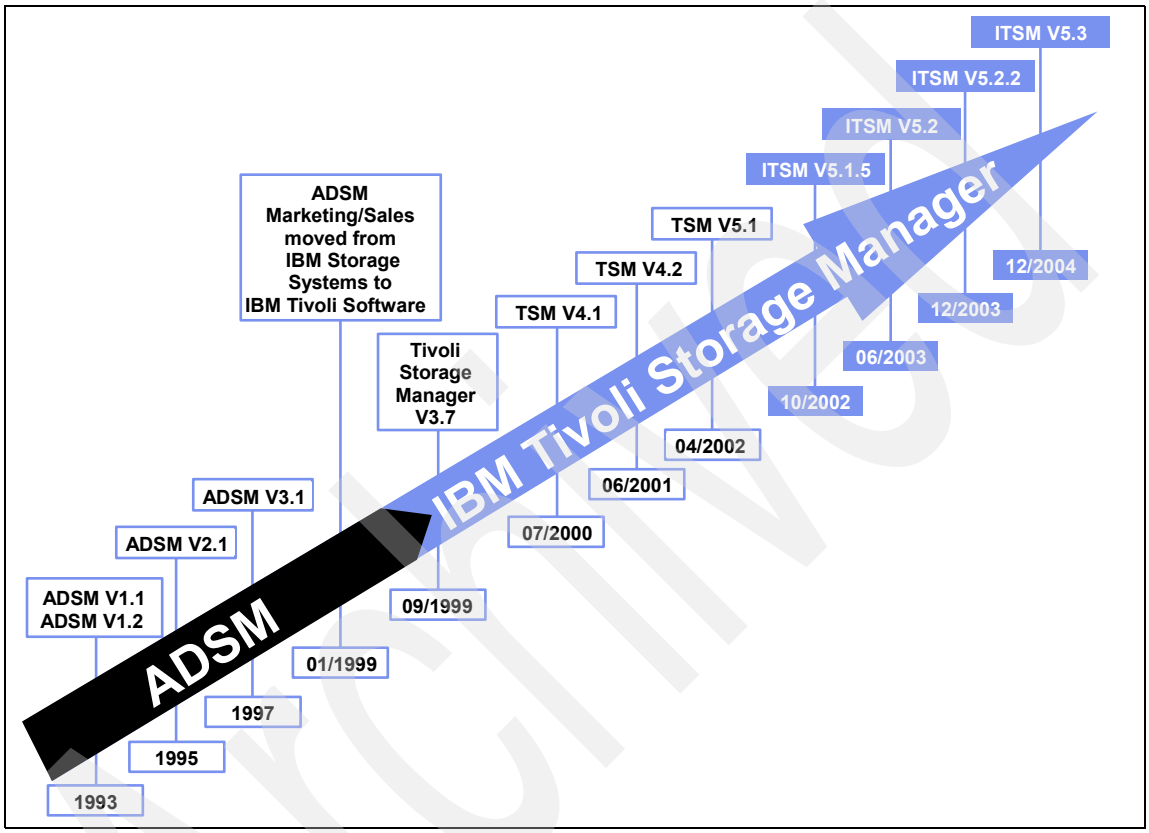

Figure 1-2 IBM Tivoli Storage Manager overall product progression

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™
- 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™ 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

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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™ (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™ 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*

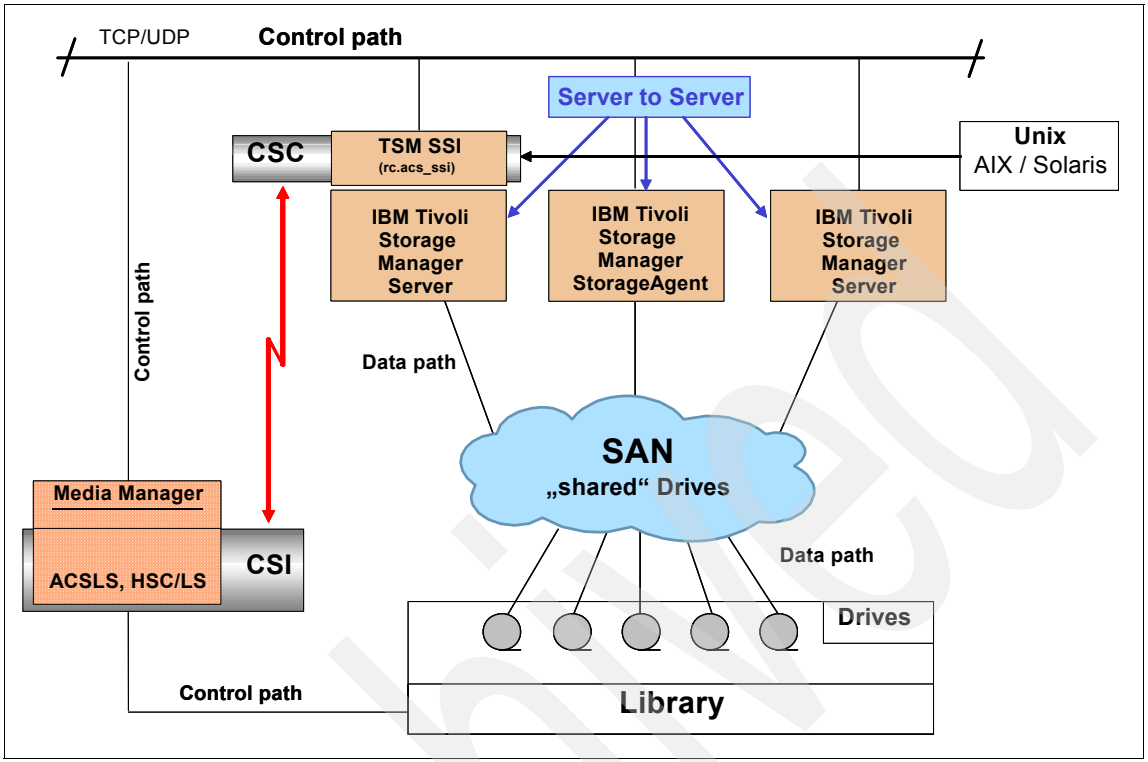

Figure 3-1 How the components for library-sharing work together

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 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 TSMLIB01 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.

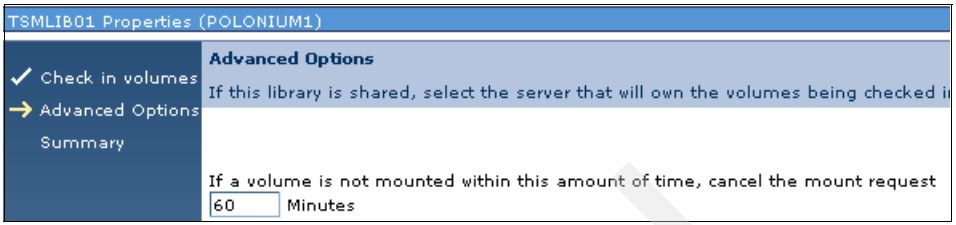

Figure 3-2 Administration Center check-in options - WAITTIME

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.

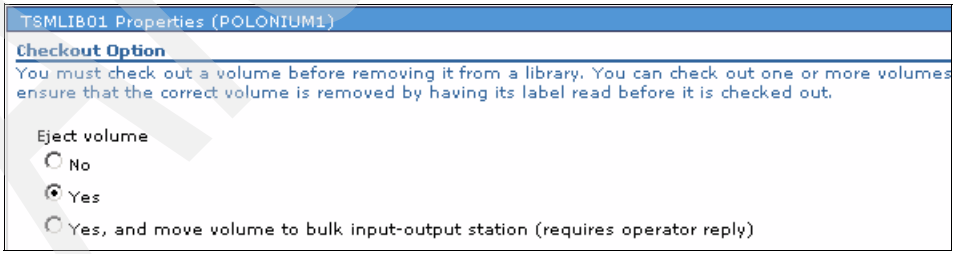

Figure 3-3 Administration Console Checkout Options - Remove No/Yes/to bulk

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.

.

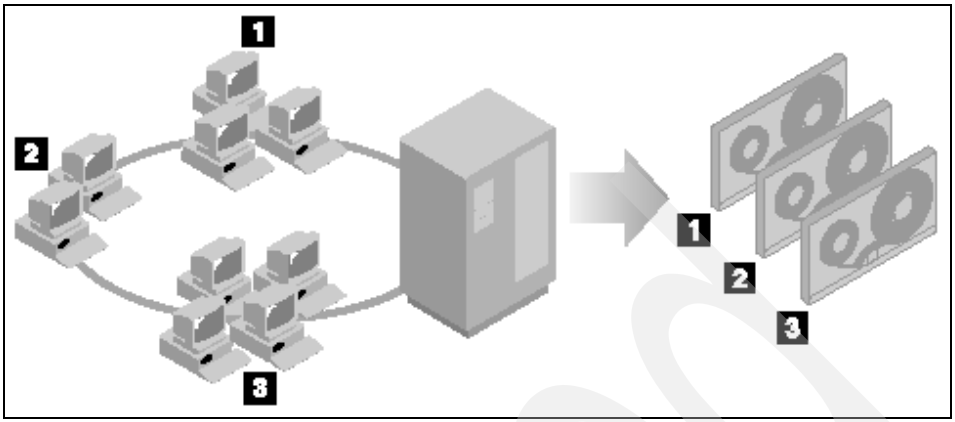

Figure 3-4 Example of collocation by group enabled

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.

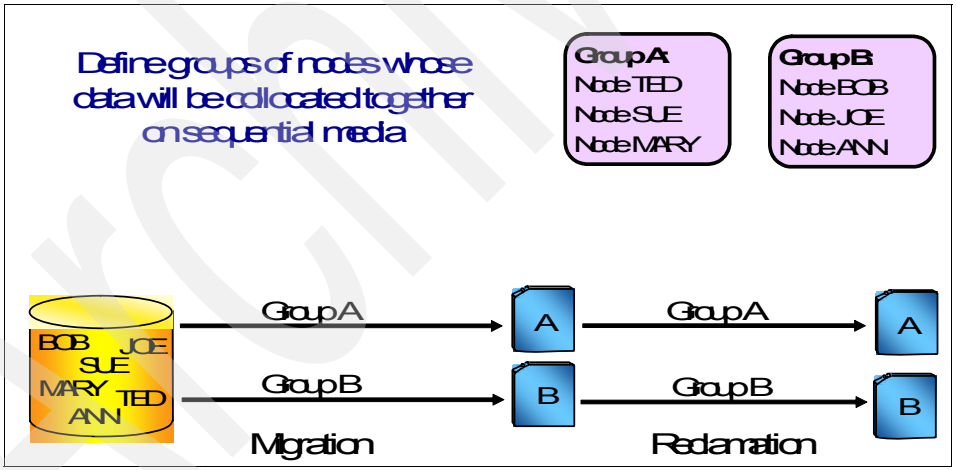

Figure 3-5 Group of nodes on sequential media

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  Days Since Days Since Locked?
                                   Name           Last Acce-   Password
                                                         ss        Set
------------------------- -------- -------------- ---------- ---------- -------
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 NODED COLLOCG=cg_example
Node Name         Volume Name                    Storage Pool       Physical
                                                 Name                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,COLLOCGROUP_NAME from nodes
NODE_NAME              COLLOCGROUP_NAME
------------------     ------------------
CRETE                  CG_EXAMPLE
CRETE1                 CG_EXAMPLE
CRETE2                 CG_EXAMPLE
POLONIUM
```

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

Table 3-1 Dependencies of 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

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.

Table 3-2 Random vs. sequential access DISK/FILE 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

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:

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

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.

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
```

Example 3-12 Validating LAN-free configuration

```
tsm: POLONIUM1>validate lanfree crete sa_crete
ANR0387I 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
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: POLONIUM1>validate lanfree crete sa_crete
ANR0387I 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- 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- ARCHIVELANF- Yes
                          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 1 storage pools capable of
LAN-free data movement and 3 storage pools not capable 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,THursday,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.

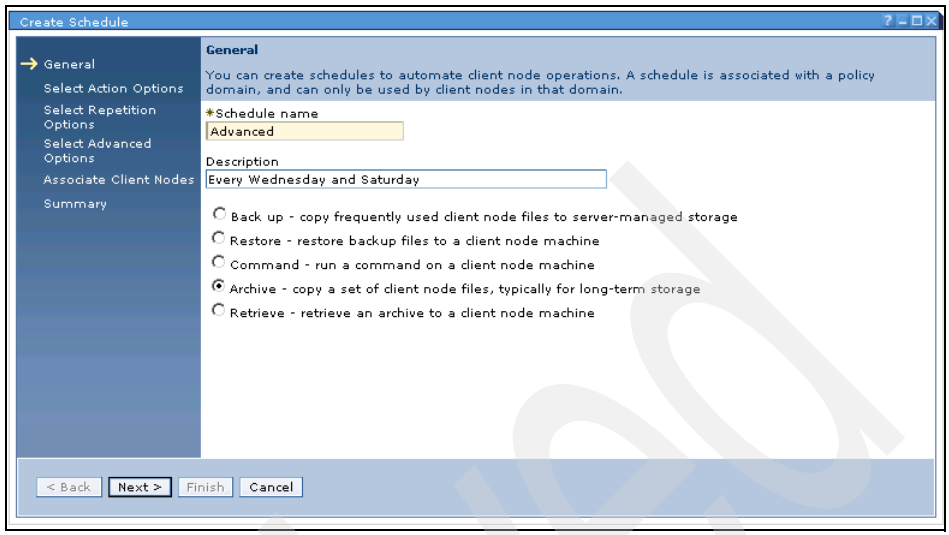

Figure 3-6 Advanced Schedule - Start Wizard

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.

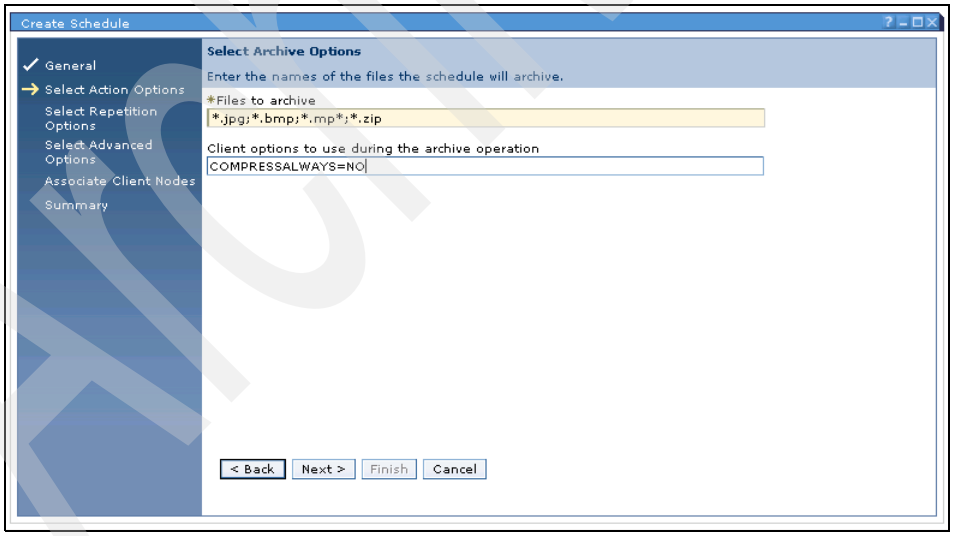

Figure 3-7 Advanced Schedule - Select Archive Options

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

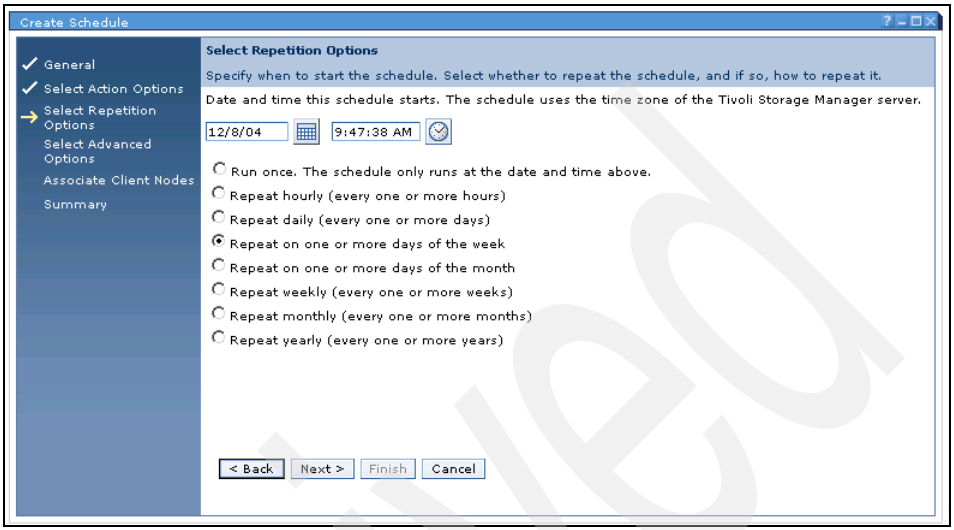

Figure 3-8 Advanced Schedule - Repetition Options

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.

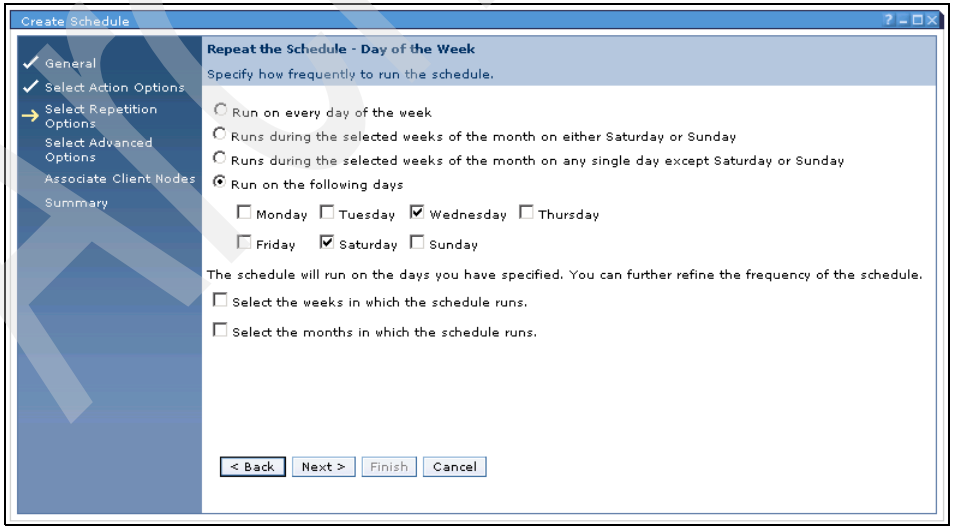

Figure 3-9 Advanced Schedule - Repeat the Schedule

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.

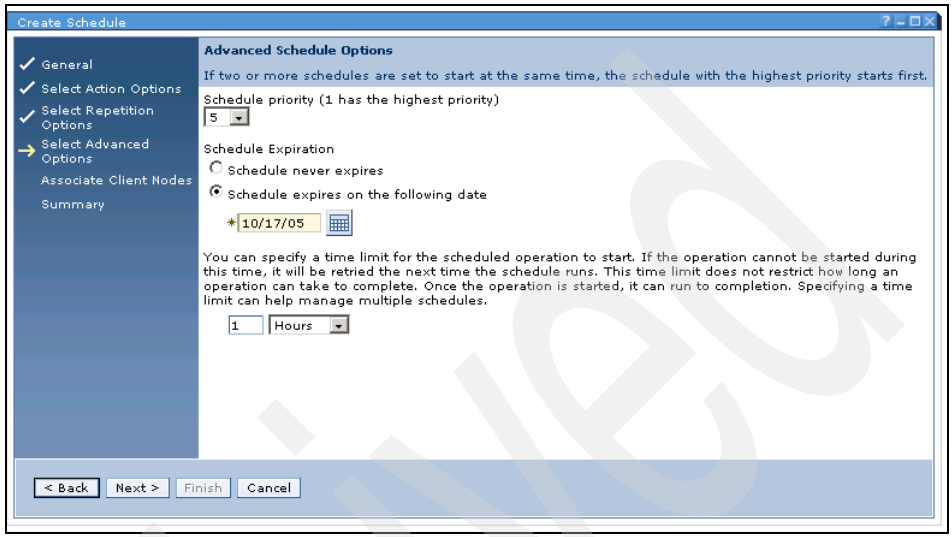

Figure 3-10 Advanced Schedule - Advanced Schedule Options

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

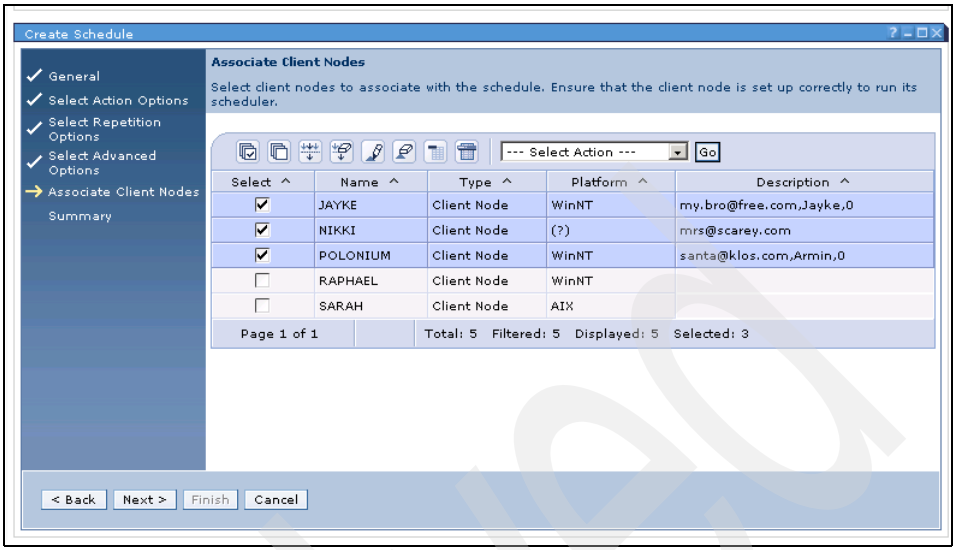

Figure 3-11 Advanced Schedule - Associate Nodes

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

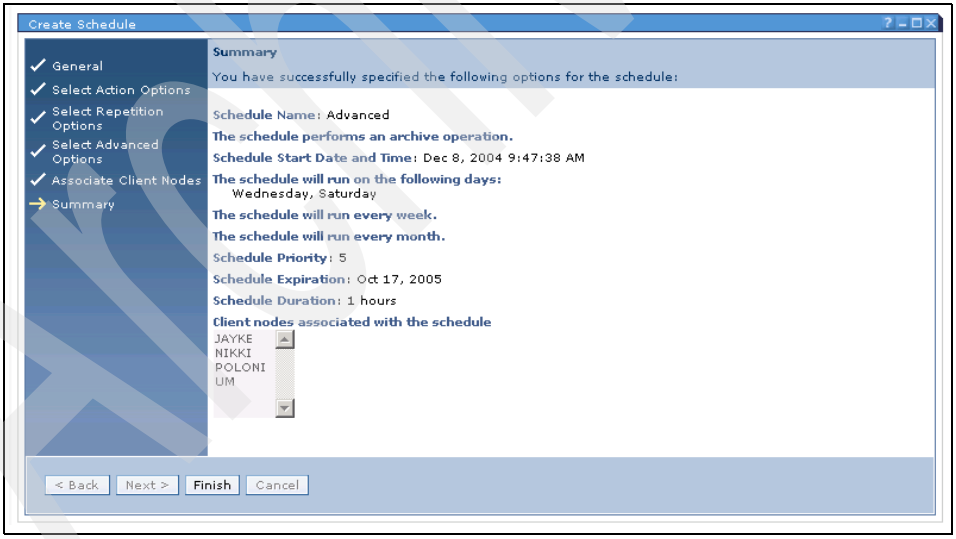

Figure 3-12 Advanced Schedule - Summary

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.

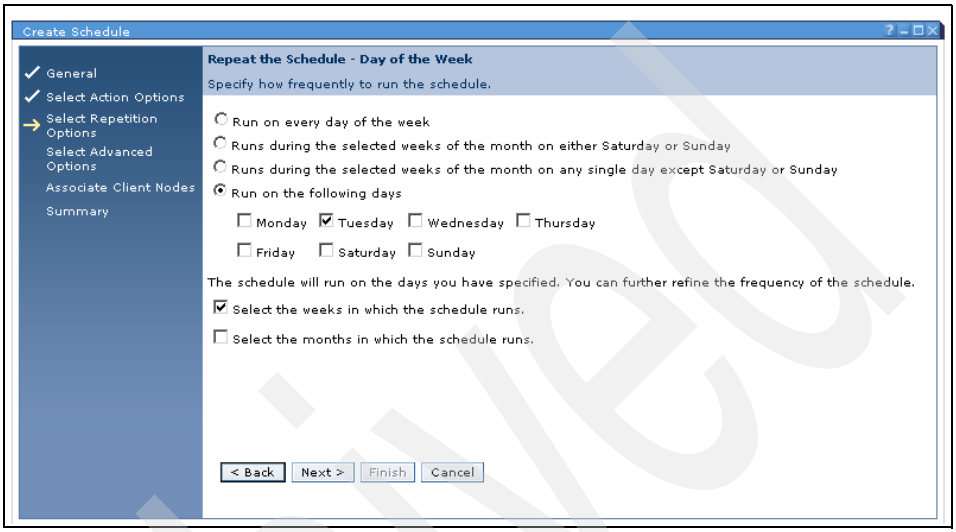

Figure 3-13 First and third Tuesday schedule

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

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

```
tsm: POLONIUM1>q act s=firstand
Date/Time           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 3-16 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 |Retention 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™ 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.

6

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.

7

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

8

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.

9

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.

10

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.

11

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.

Example 11-1 Output from the command SHOW LANFREE

```
Node  Storage  Operation Mgmt Class Destination  LAN-Free  Explanation
Name  Agent              Name       Name         capable?
----- -------- --------- ---------- ------------ --------- --------------------
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
```

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.

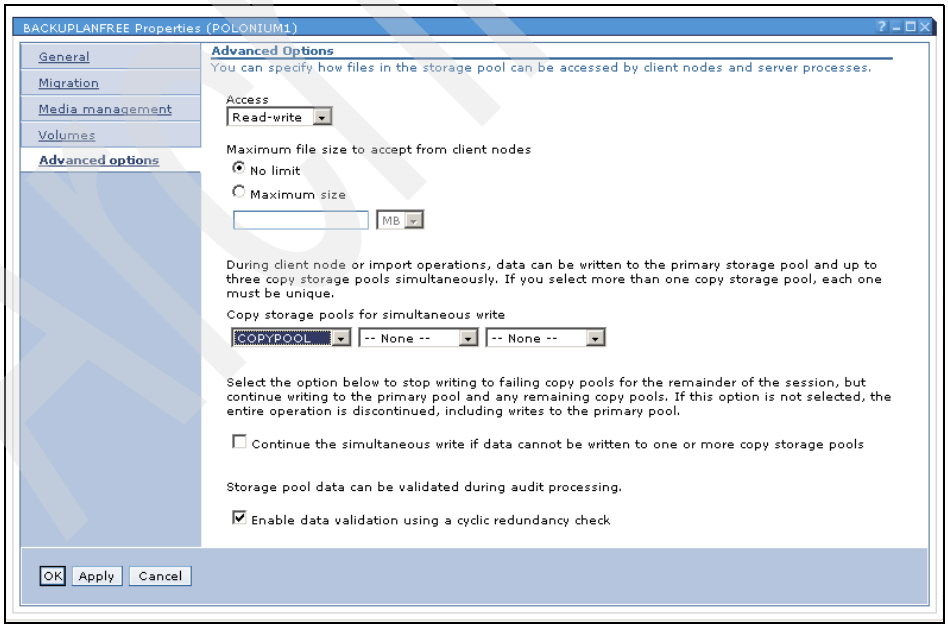

Figure 11-1 Storage Pool properties Advanced Options

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
ANR0387I 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- 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- ARCHIVELANF- Yes
                          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.
ANR0388I 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 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 *LANFREECommmethod=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.

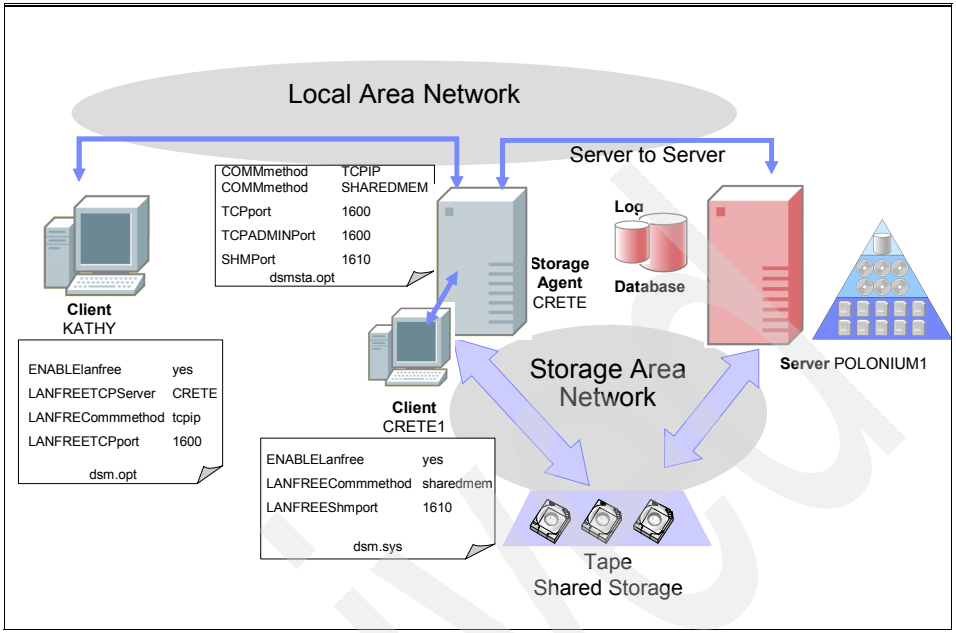

Figure 11-2 Components and connections in our LAN-free environment

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
ANR0387I 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
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.
```

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
ANR0387I 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
```

```
KATHY SA_CRETE BACKUP    STANDARD   BACKUPPOOL   No        Destination storage
                                                           pool is DISK.
KATHY SA_CRETE ARCHIVE   MC_FS_LAN- ARCHIVELANF- Yes
                          FREE       REE
KATHY 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 KATHY 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.
```

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
ANR0408I Session 2 started for server POLONIUM1 (Windows) (Tcp/Ip) for event
logging.
ANR0408I 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.
ANR0916I TIVOLI STORAGE MANAGER distributed by Tivoli is now ready for use.
TSM:SA_CRETE>
ANR0400I Session 9 started for node CRETE (AIX) (ShMem).
ANR0408I Session 10 started for server POLONIUM1 (Windows) (Tcp/Ip) for storage
agent.
ANR0408I Session 11 started for server POLONIUM1 (Windows) (Tcp/Ip) for library
sharing.
ANR0409I Session 11 ended for server POLONIUM1 (Windows).
ANR0408I Session 12 started for server POLONIUM1 (Windows) (Tcp/Ip) for library
sharing.
ANR0409I Session 12 ended for server POLONIUM1 (Windows).
ANR8337I LTO volume ABA928L1 mounted in drive DRIVE01 (/dev/rmt0).
ANR0511I Session 9 opened output volume ABA928L1.
ANR0514I Session 9 closed volume ABA928L1.
AANR0403I Session 9 ended for node CRETE (AIX).
ANR0408I 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 DRIVE01 (/dev/rmt0) in
library TSMLIB01.
ANR0409I Session 17 ended for server POLONIUM1 (Windows).
```

```
ANR0406I 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.
ANR0408I 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).
ANR0408I 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.
ANR0409I 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.

12

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™ 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.

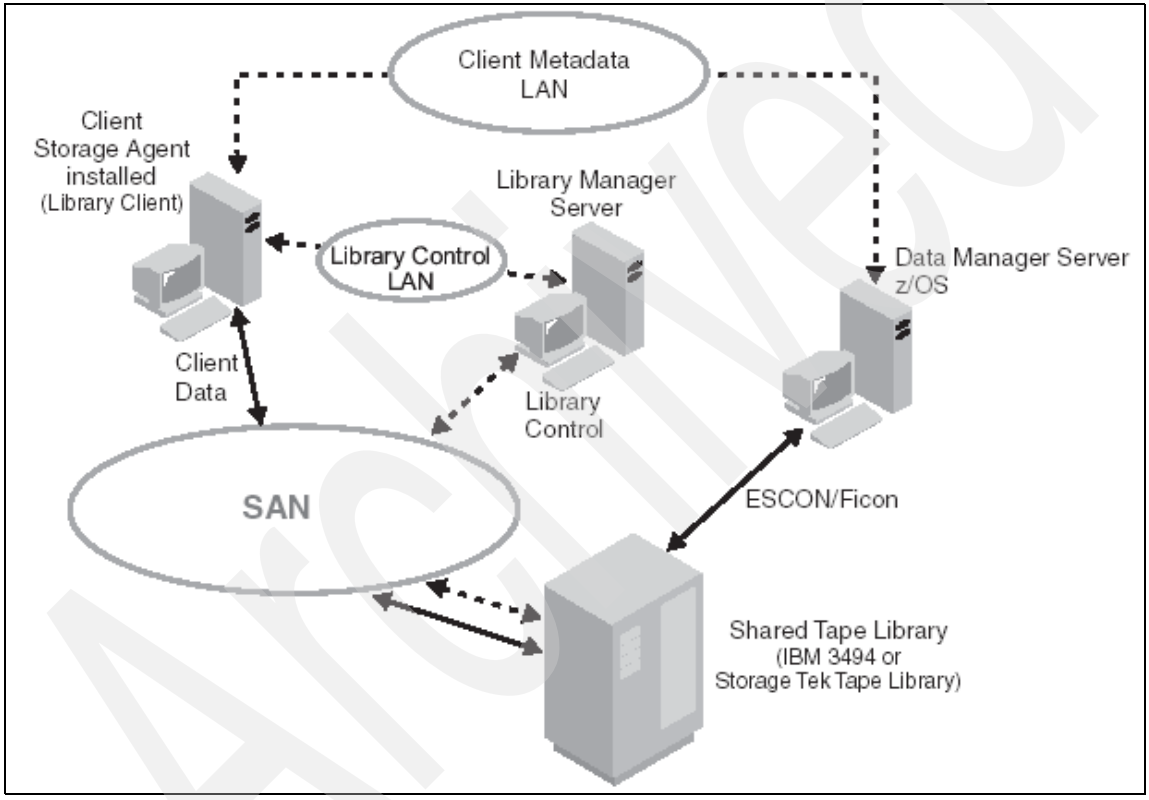

Figure 17-1 LAN-free data movement for z/OS

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/*
             Size      Backup Date        Mgmt Class A/I File
             ----      -----------        ---------- --- ----
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/
                   Modified: 11/23/04   17:37:20   Accessed: 11/23/04   17:37:42
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/IBMinvscout
                   Modified: 06/23/04   10:37:11   Accessed: 06/23/04   10:37:11
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/Tivoli
                   Modified: 11/23/04   13:31:49   Accessed: 11/23/04   15:58:53
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/csm
                   Modified: 11/23/04   17:37:25   Accessed: 11/23/04   17:37:42
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/diagnostics
                   Modified: 07/07/04   18:30:20   Accessed: 07/07/04   18:30:20
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/freeware
                   Modified: 11/23/04   13:49:34   Accessed: 11/23/04   15:58:53
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/hsc
                   Modified: 11/23/04   17:37:20   Accessed: 11/23/04   17:37:20
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/lost+found
                   Modified: 11/23/04   13:30:16   Accessed: 11/23/04   15:58:53
              512  B  11/24/04   09:11:37    MC_FS       A  /opt/pssp_to_csm
                   Modified: 07/07/04   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/*
             Size  Archive Date - Time    File - Expires on - Description
             ----  -------------------    ---------------------------
            2,048  B  11/25/04   15:35:09    /tmp/ 11/25/05   archive before
installation of isc
                   Modified: 11/25/04   15:31:37   Accessed: 11/25/04   15:33:23
              512  B  11/25/04   15:35:09    /tmp/.X11-unix 11/25/05   archive
before installation of isc
                   Modified: 11/25/04   09:30:46   Accessed: 11/25/04   15:33:23
              512  B  11/25/04   15:35:09    /tmp/.oslevel.datafiles 11/25/05
archive before installation of isc
                   Modified: 11/25/04   14:20:58   Accessed: 11/25/04   15:33:23
              512  B  11/25/04   15:35:09    /tmp/ISC_TEMP 11/25/05   archive
before installation of isc
                   Modified: 11/25/04   14:21:47   Accessed: 11/25/04   15:33:23
              512  B  11/25/04   15:35:09    /tmp/aaah3y_ya 11/25/05   archive
before installation of isc
                   Modified: 11/24/04   08:23:03   Accessed: 11/25/04   15:33:24
              512  B  11/25/04   15:35:09    /tmp/aaalbrzUa 11/25/05   archive
before installation 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.

Table 18-1 Overview of 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.

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. *You must have authorization to access the stored data of another node.*

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** → **View Policy Information** from the Web client interface, which then displays the policy information as shown Figure 18-1.

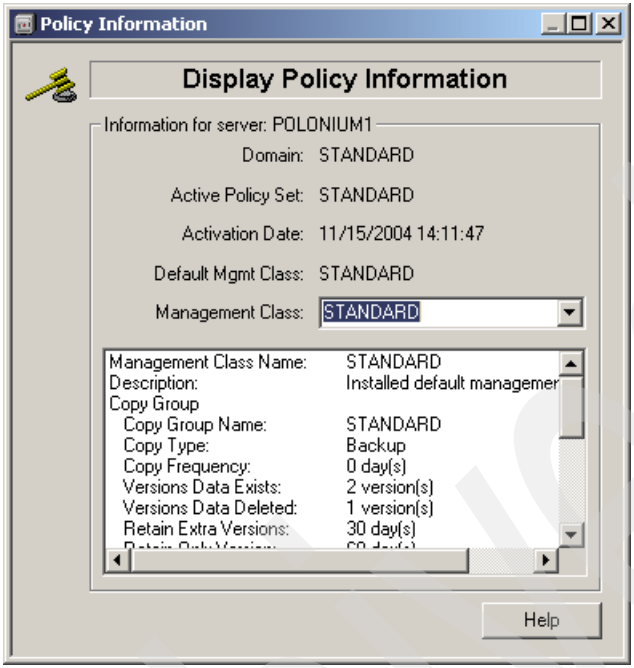

Figure 18-1 Viewing Policy Information

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:
                          \\klchl2m\c$
               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: 5S,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 Filespace
  #     Last Incr Date      Type    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 Incr Date      Type    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** → **Preview Include-Exclude** from the client interface.This brings up the Preview Include-Exclude dialog box shown in Figure 18-2.

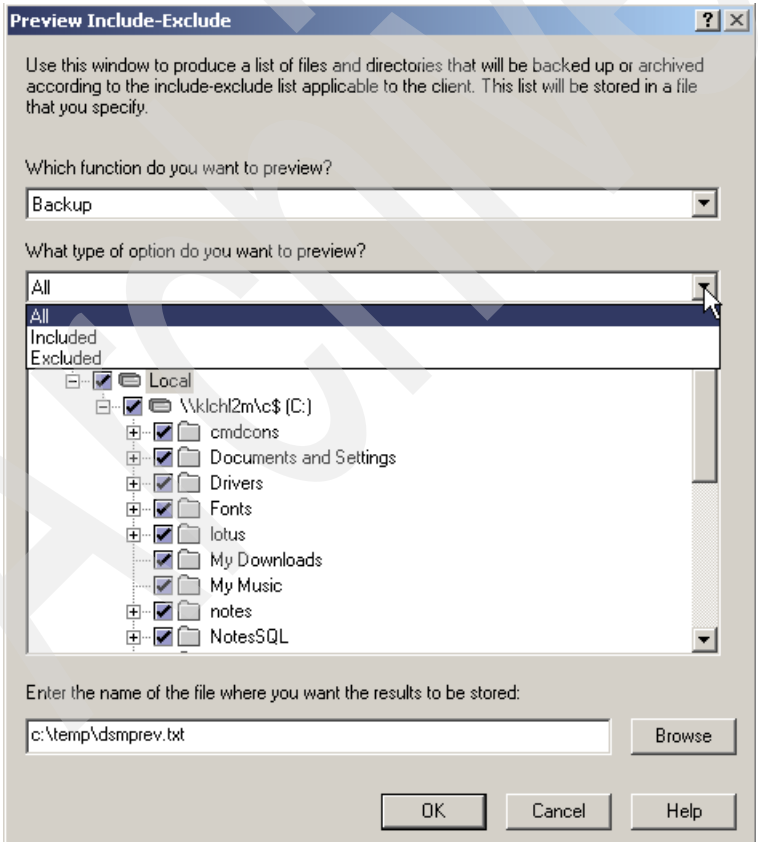

Figure 18-2 Web client: Preview Include-Exclude

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

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** → **File details...** from the Web or Java client interface.This brings up the Information Window shown in Figure 18-4.

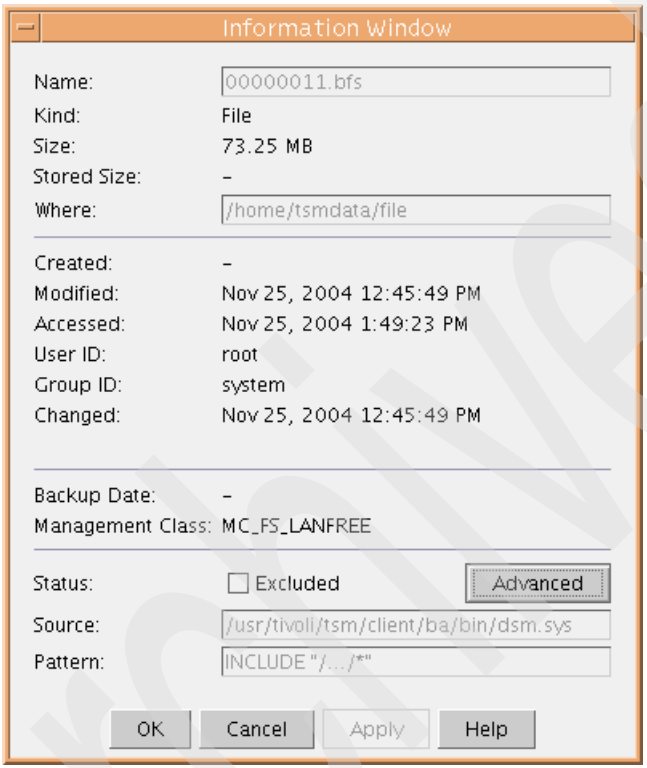

Figure 18-4 Client Web/Java GUI: Details of included and excluded objects

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

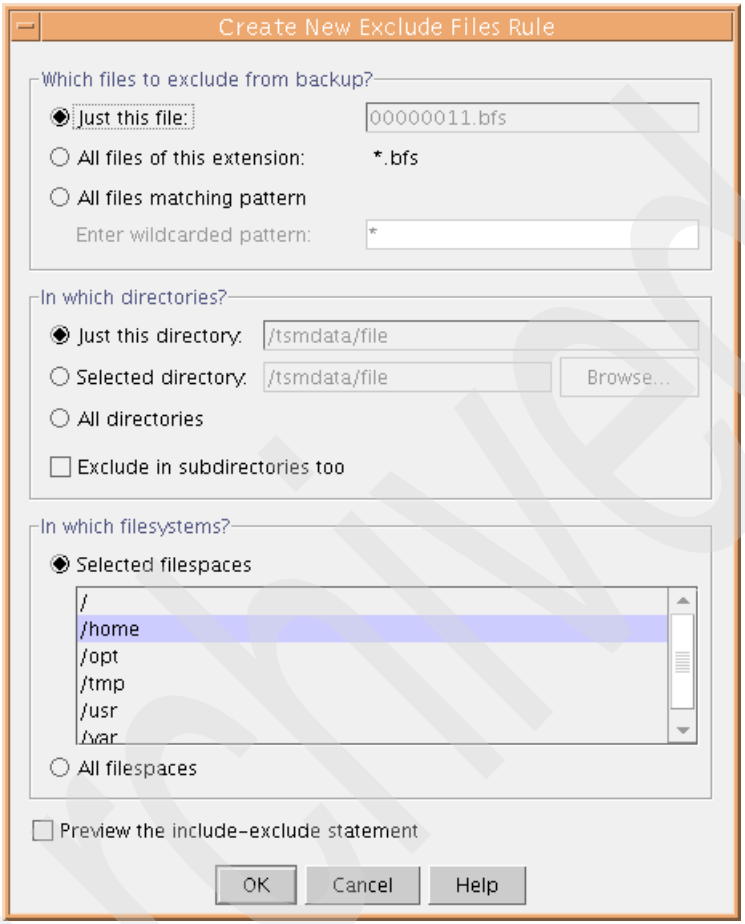

Figure 18-5 Client Web/Java GUI: Advanced options, include/exclude of objects

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).

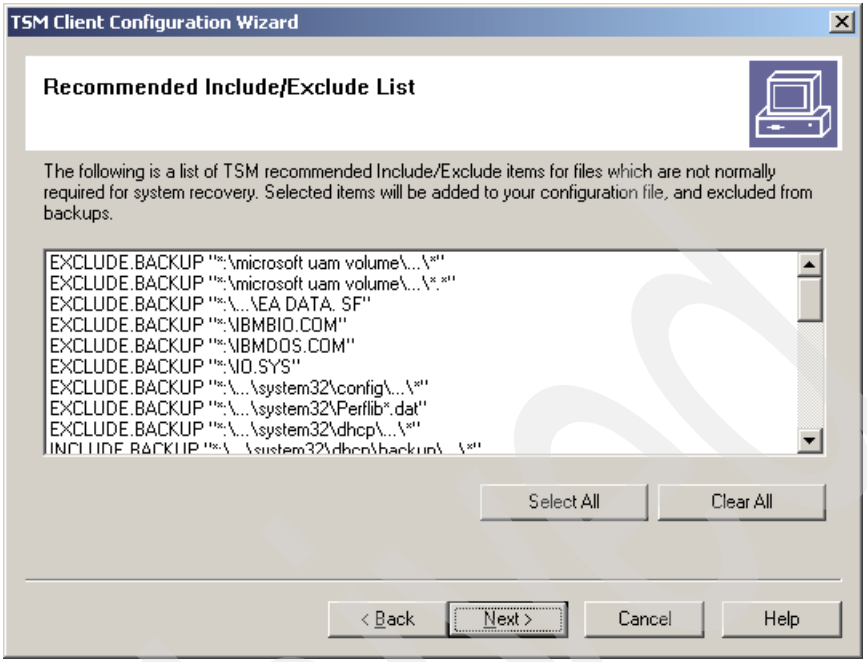

Figure 18-6 Client Configuration Wizard: Recommended Include/Exclude List

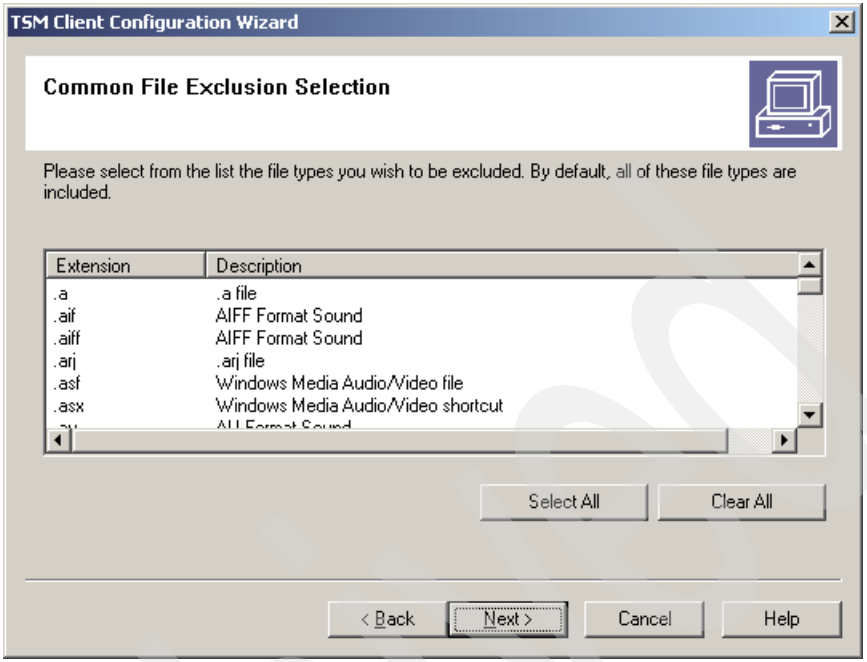

Figure 18-7 Client Configuration Wizard: Common File Exclusion Selection

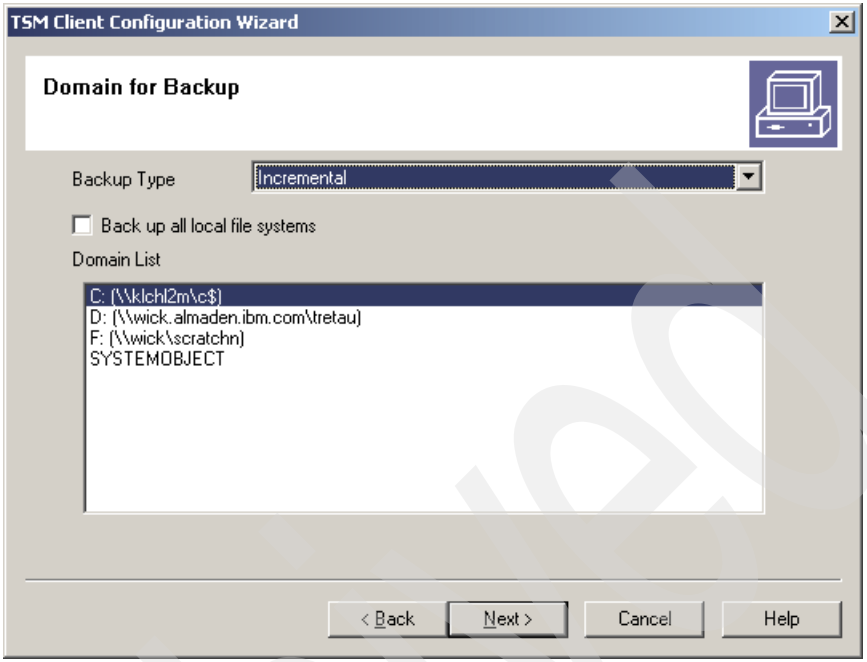

Figure 18-8 Client Configuration Wizard: Selection of Domain for Backup

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** → **Include Item(s)** or **Edit** → **Exclude Item(s)** from the Web and Java client interface. This brings up the resultant Backup window shown in Figure 18-9.

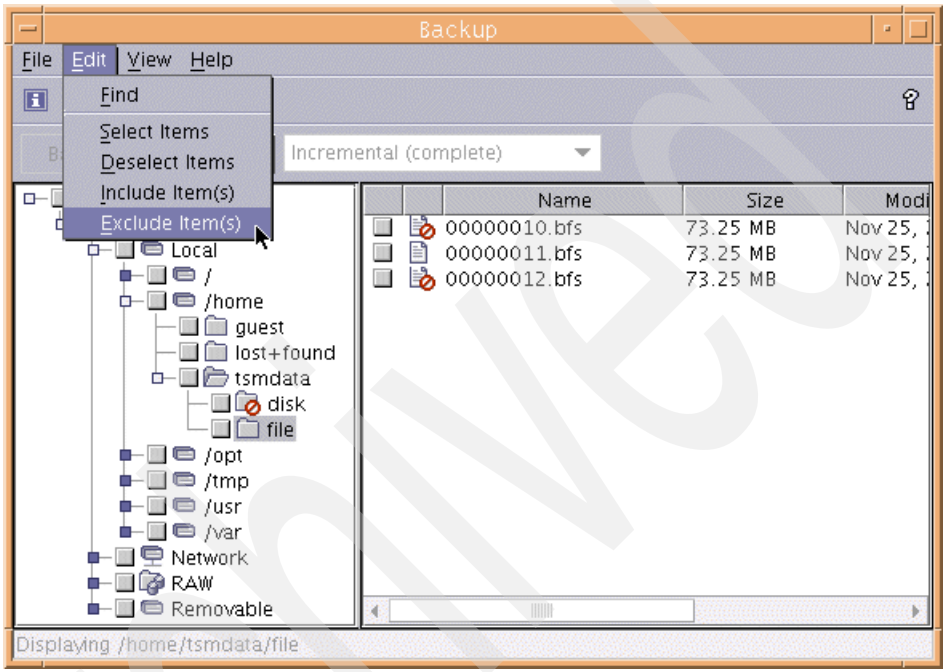

Figure 18-9 Client Web/Java GUI: Include/Exclude files or directories

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.

Example 18-9 Querying scheduled events: new fields

```
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/Time        File Size A/I  File
     ------------------------------------------------------------------------
     1. | 11/22/2004 17:36:52        100  B  A   \\polonium1\c$\Sdwork\apiver
     2. | 11/22/2004 17:36:52       1.53 KB  A   \\polonium1\c$\Sdwork\bluepa
     3. | 11/22/2004 17:36:52        107  B  A   \\polonium1\c$\Sdwork\c4ebcu
     4. | 11/22/2004 17:36:52        247  B  A   \\polonium1\c$\Sdwork\cbpdon
x    5. | 11/22/2004 17:36:52        147  B  A   \\polonium1\c$\Sdwork\imgpla
     6. | 11/22/2004 17:36:52      94.41 KB  A   \\polonium1\c$\Sdwork\issimo
     7. | 11/22/2004 17:36:52         43  B  A   \\polonium1\c$\Sdwork\monset
     8. | 11/22/2004 17:36:52       1.88 KB  A   \\polonium1\c$\Sdwork\MRF.IN
     9. | 11/22/2004 17:36:52       1.34 KB  A   \\polonium1\c$\Sdwork\mtm.in
x   10. | 11/22/2004 17:36:52       3.25 KB  A   \\polonium1\c$\Sdwork\remove
    11. | 11/22/2004 17:36:52       1.22 KB  A   \\polonium1\c$\Sdwork\web.in
    12. | 11/22/2004 17:36:52        109  B  A   \\polonium1\c$\Sdwork\binw32
    13. | 11/22/2004 17:36:52        109  B  A   \\polonium1\c$\Sdwork\binwin
    14. | 11/22/2004 17:36:52        109  B  A   \\polonium1\c$\Sdwork\binwin
        |
        |
        0---------10--------20--------30--------40--------50--------60--------7
<U>=Up  <D>=Down  <T>=Top  <B>=Bottom  <R#>=Right  <L#>=Left
<G#>=Goto Line #  <#>=Toggle Entry  <+>=Select All  <->=Deselect All
<#:#+>=Select A Range <#:#->=Deselect A Range  <O>=Ok  <C>=Cancel
pick>

Backup files will be deleted.  Do you wish to proceed? (Yes (Y)/No (N)) y
Backup Delete->             147 \\polonium1\c$\Sdwork\imgplat.ini [Sent]
Backup Delete->           3,329 \\polonium1\c$\Sdwork\removenis.ini [Sent]


Total number of objects deleted:          2
Total number of objects failed:           0
Total number of bytes transferred:        0  B
Data transfer time:                    0.00 sec
Network data transfer rate:            0.00 KB/sec
Aggregate data transfer rate:          0.00 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           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.

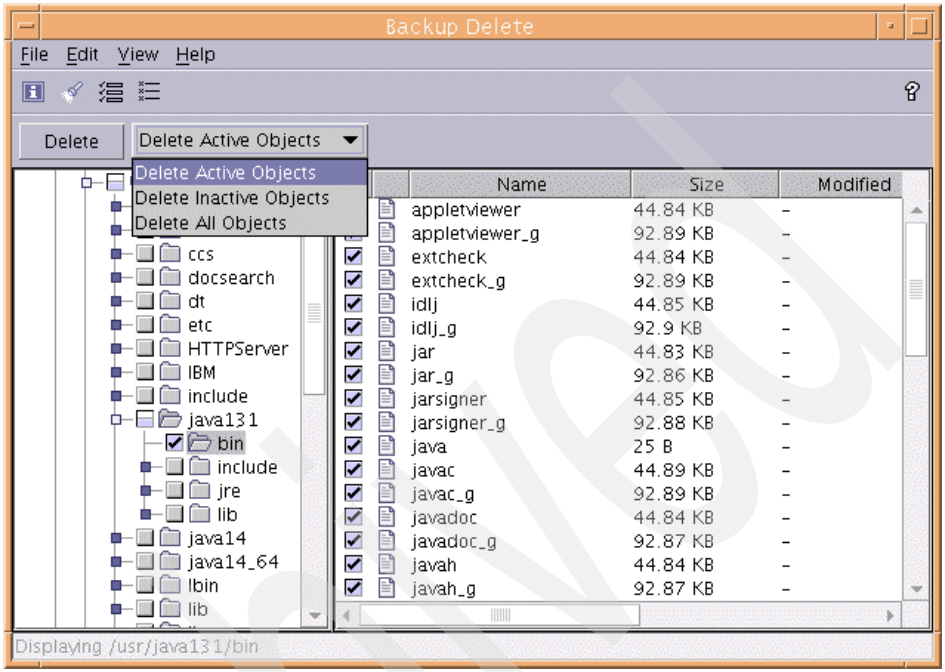

Figure 18-10 Client Web/Java GUI: Delete Backup Data from the Utilities menu

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.
Recommendation: Use the default value instead of specifying the *diskbuffsize* option.

largecommbuffers This option has been replaced by the *diskbuffsize* option. At this time, *largecommbuffers* 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 *largecommbuffers* will be ignored in favor of the *diskbuffsize* setting.
Recommendation: Discontinue the use of *largecommbuffers* 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 *tcpport* 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 *no* to *yes*. *tcpnodelay yes* 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.
Recommendation: Use the default of *yes*, 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.

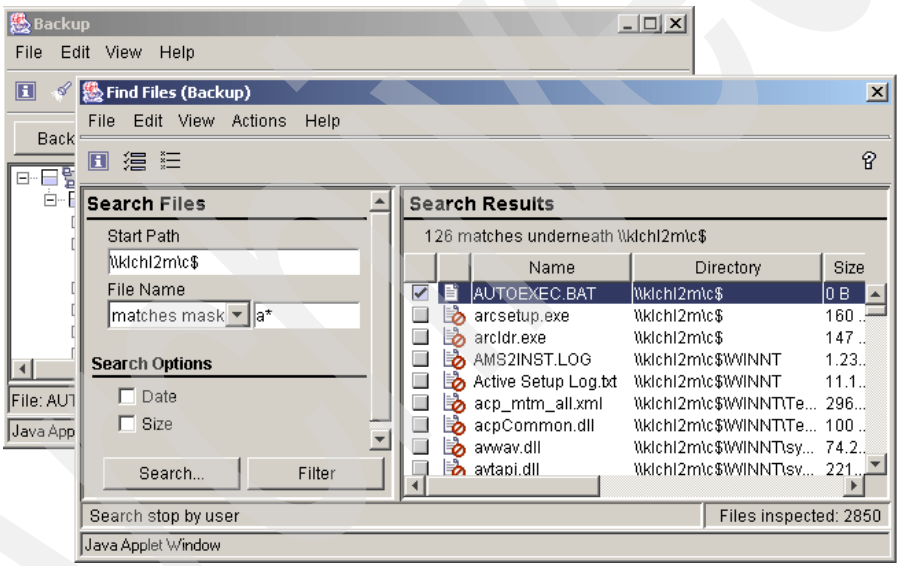

Figure 18-11 Finding files in the backup, restore, archive or retrieve window

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.

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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.

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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
Total number of objects backed up:        2
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
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%
Elapsed processing time:           00:00:04

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\jnlServer**

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.

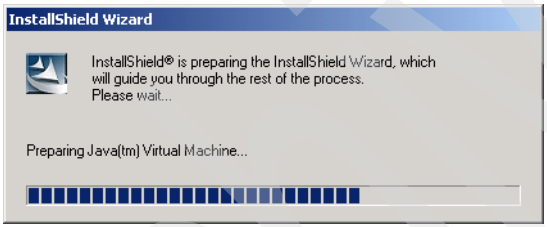


Figure 23-1 Java install

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.

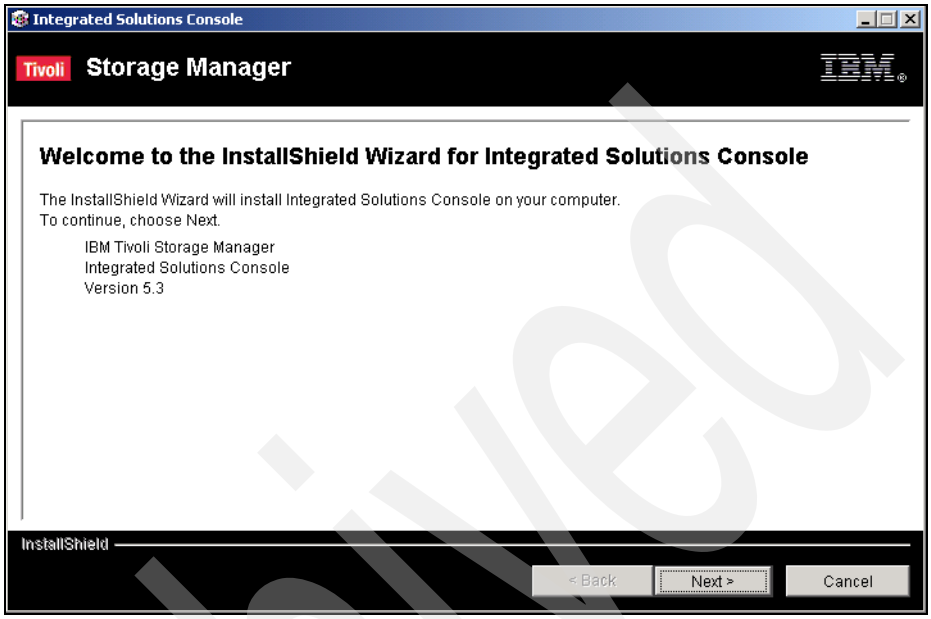


Figure 23-2 Initial Welcome window for ISC Install

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.

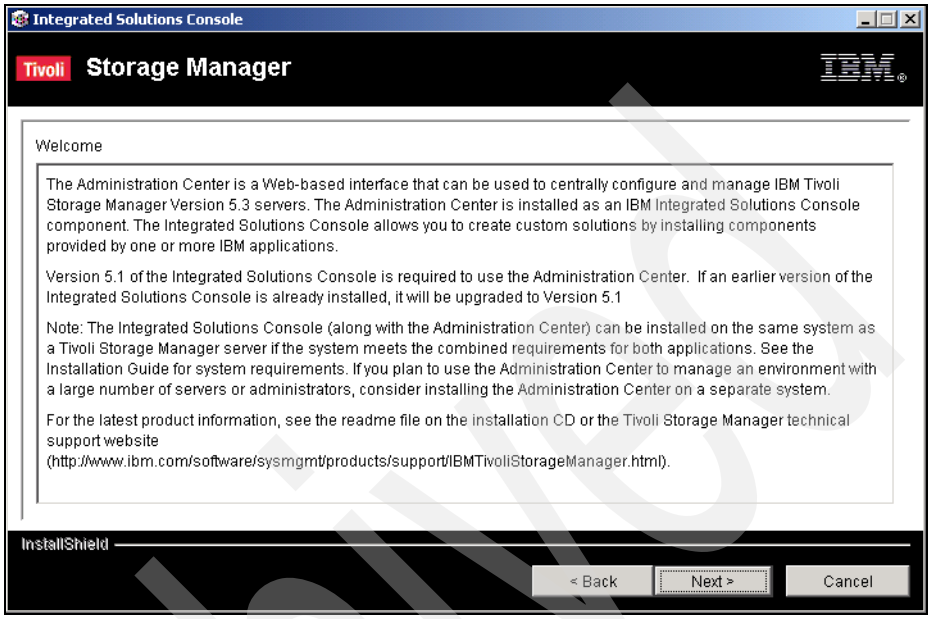


Figure 23-3 Second Welcome window

The next step is to accept the International Program License Agreement as in Figure 23-4. Click **Next** to continue.

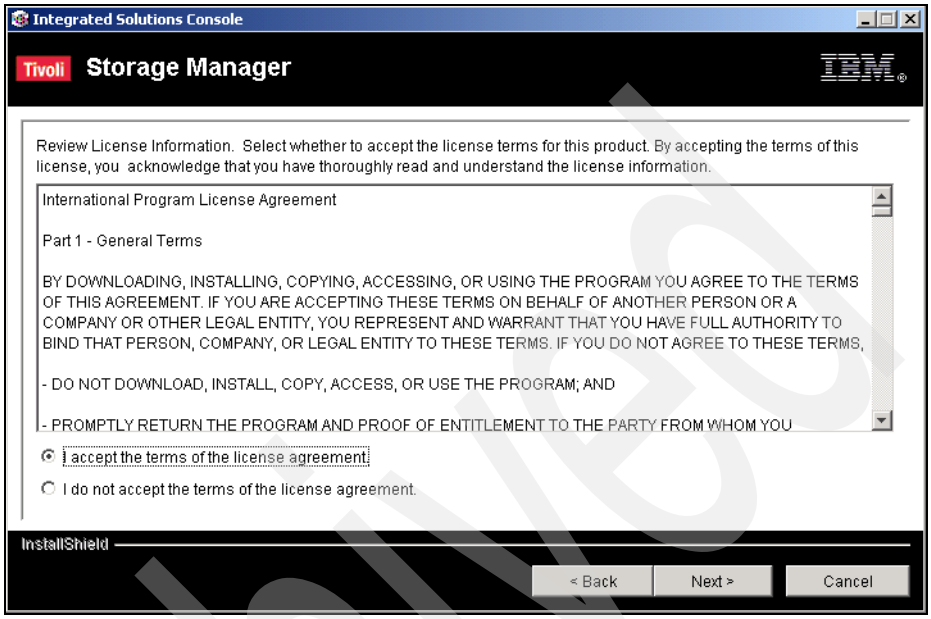


Figure 23-4 International Program License Agreement window

The next window allows the CD installation path to be entered or confirmed, as shown in Figure 23-5. Click **Next** to continue.

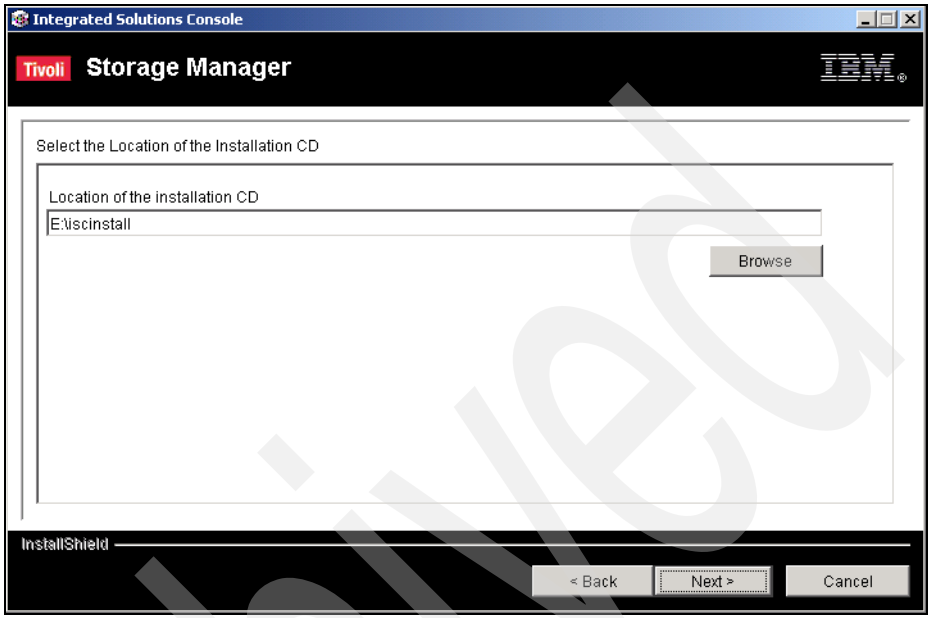


Figure 23-5 Location of Installation CD

The next step is to point to the installation destination, as shown in Figure 23-6. Then click **Next** to continue.

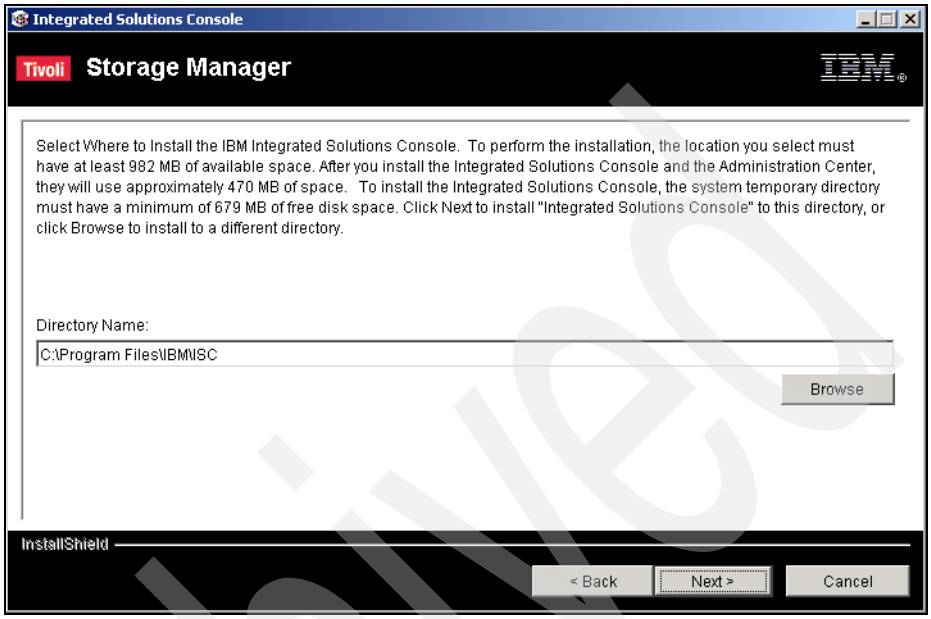


Figure 23-6 Install destination

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.

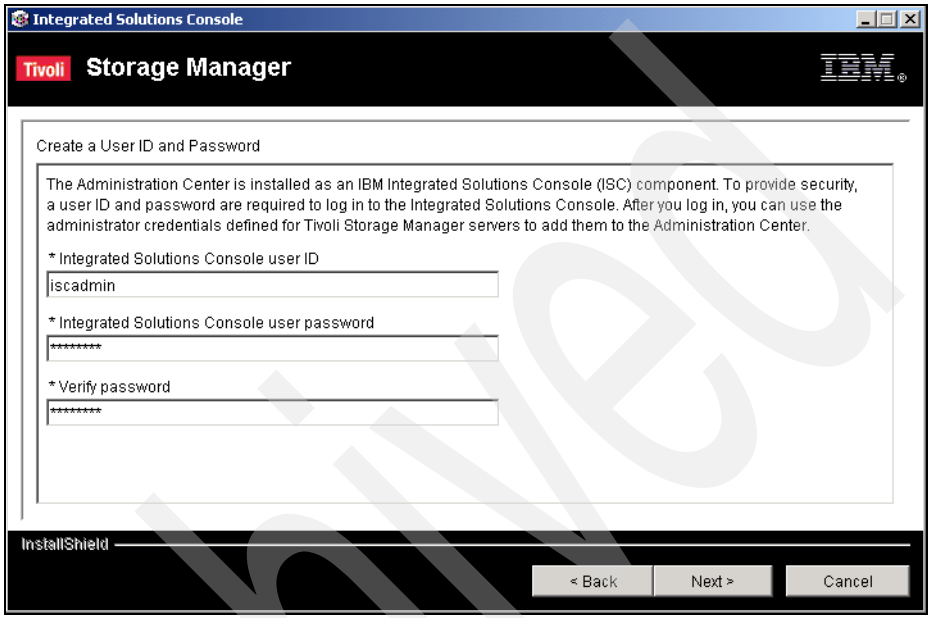


Figure 23-7 Create ISC administrator userid and password

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.

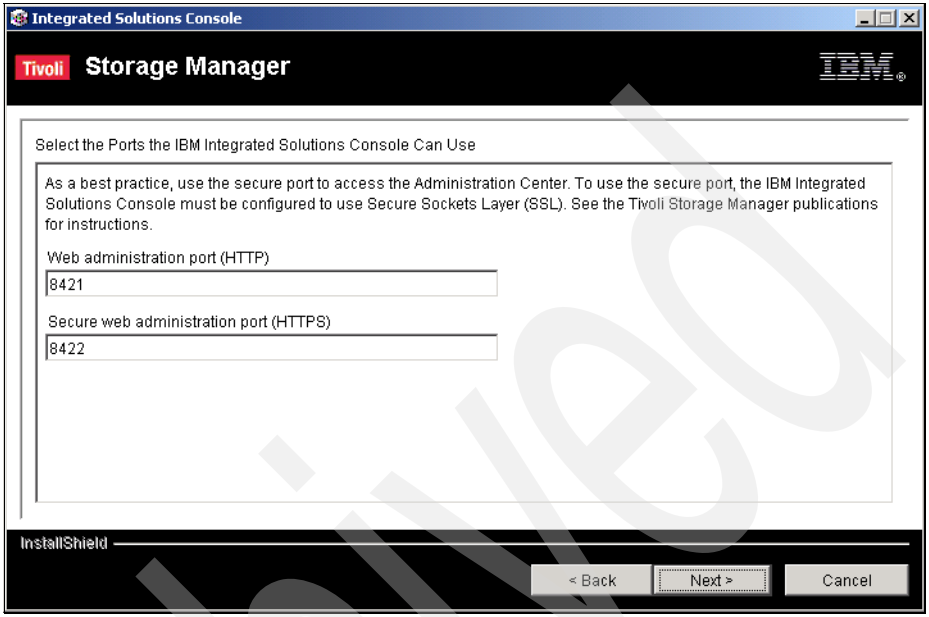


Figure 23-8 Select ports for ISC to use

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.

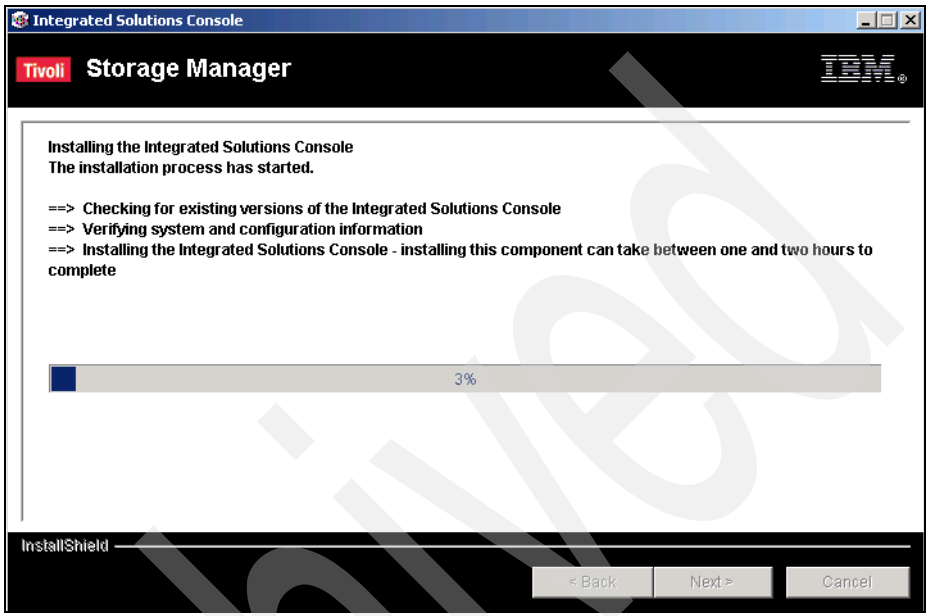


Figure 23-9 Installing the ISC

Once the installation has completed, you should see the window in Figure 23-10. Click **Next** to continue.

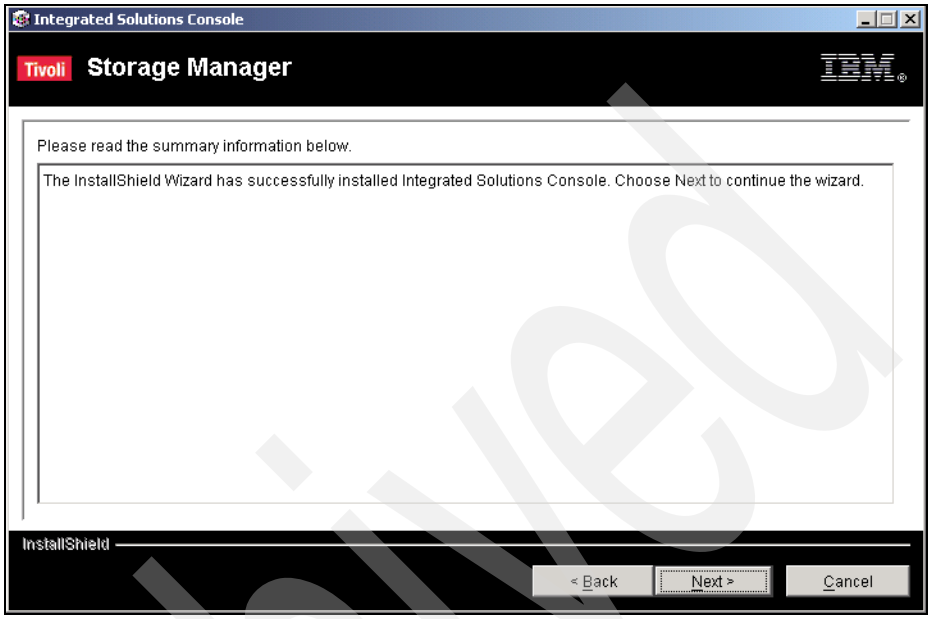


Figure 23-10 Installation completed successfully

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.

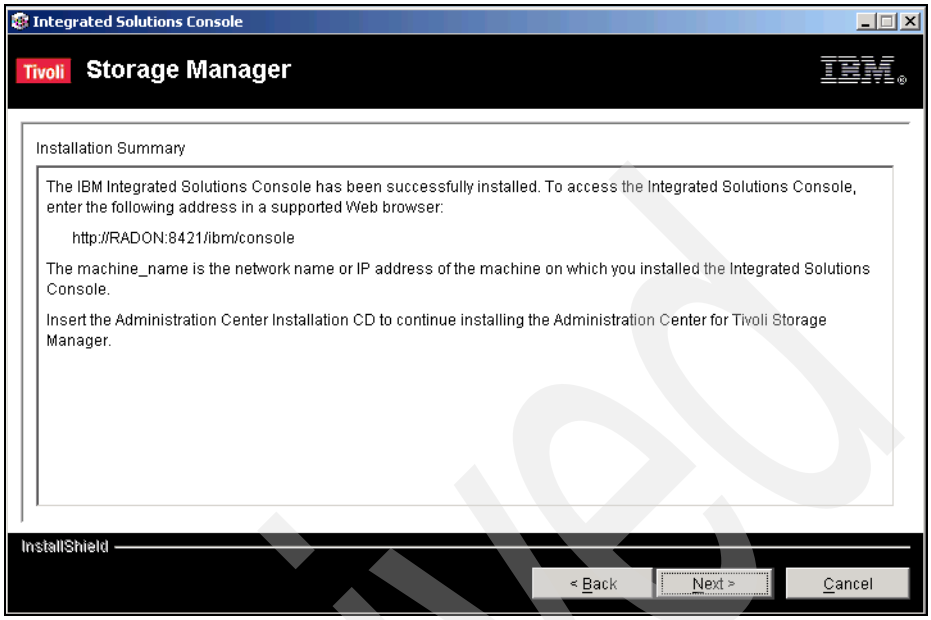


Figure 23-11 Installation summary and login details

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.

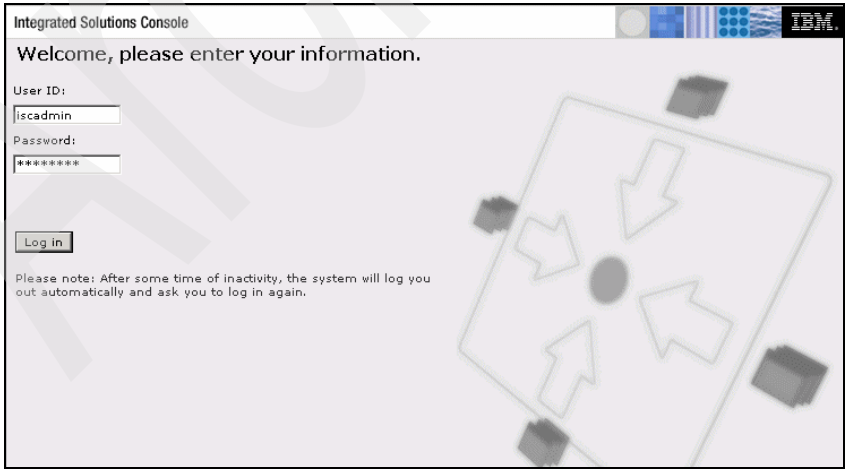


Figure 23-12 Automatically launched ISC Login page

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.

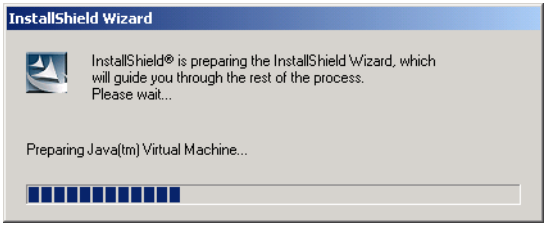


Figure 23-13 Java Virtual Machine preparation

Next, the InstallShield Welcome window is displayed. This is displayed in Figure 23-14.Click **Next** to continue the installation.

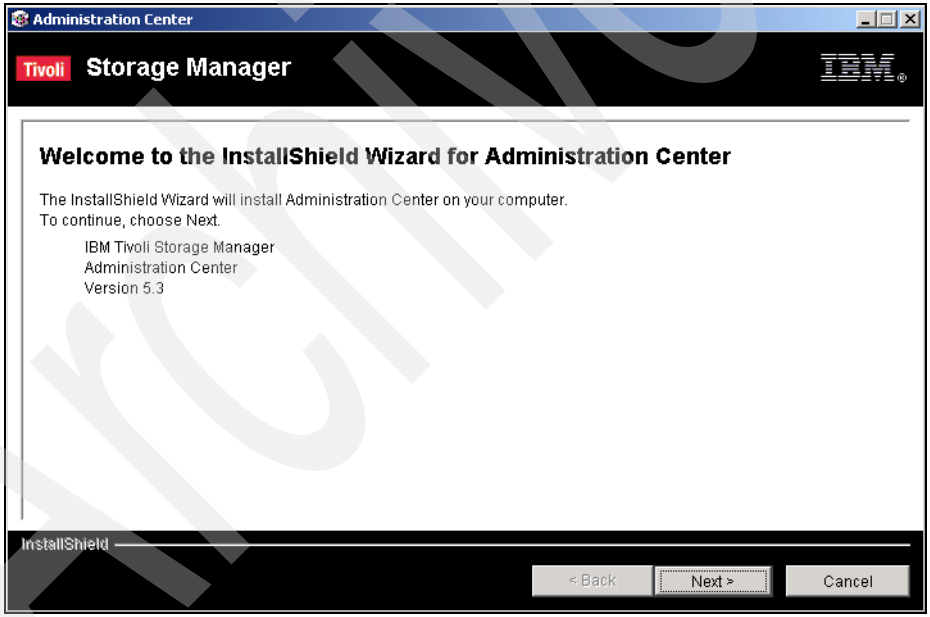


Figure 23-14 Welcome to InstallShield Wizard for Administration Center

You are then presented with the Administration Center detailed Welcome window, as shown in Figure 23-15.

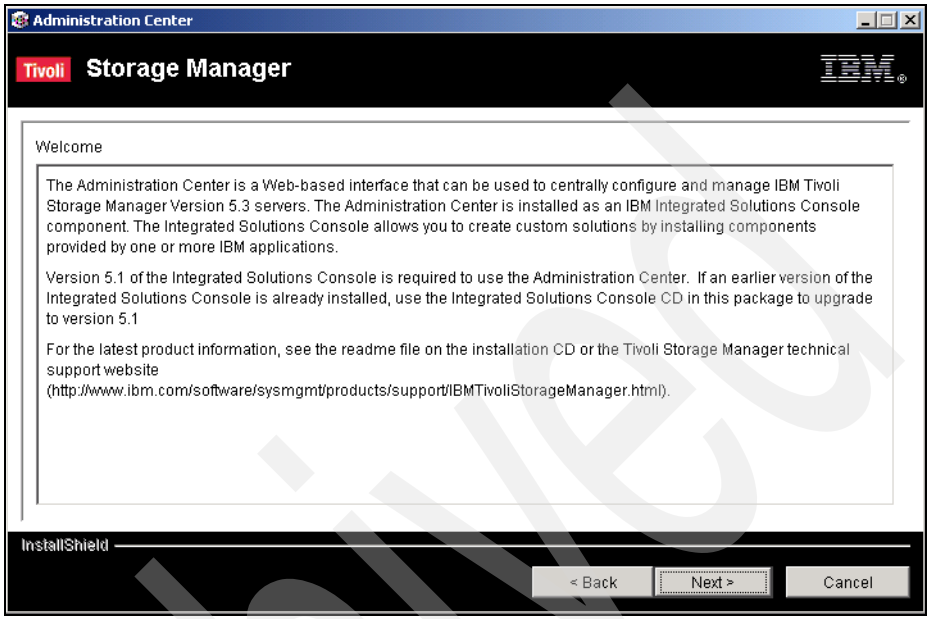


Figure 23-15 Second Welcome with further details

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.

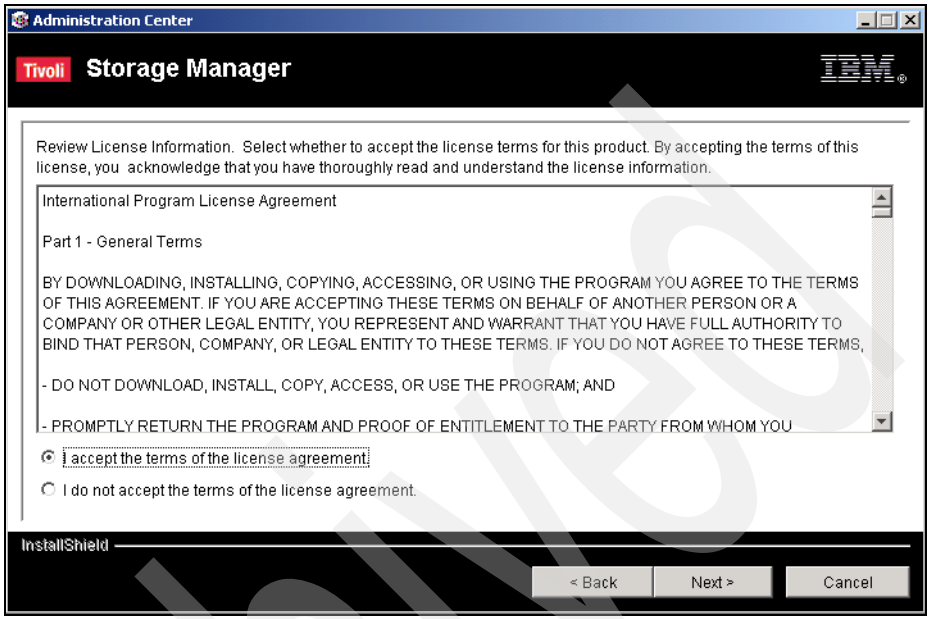


Figure 23-16 International Program License Agreement window

Once the agreement is accepted, the option to change the installation path and Web Administration Port is provided, as shown in Figure 23-17.

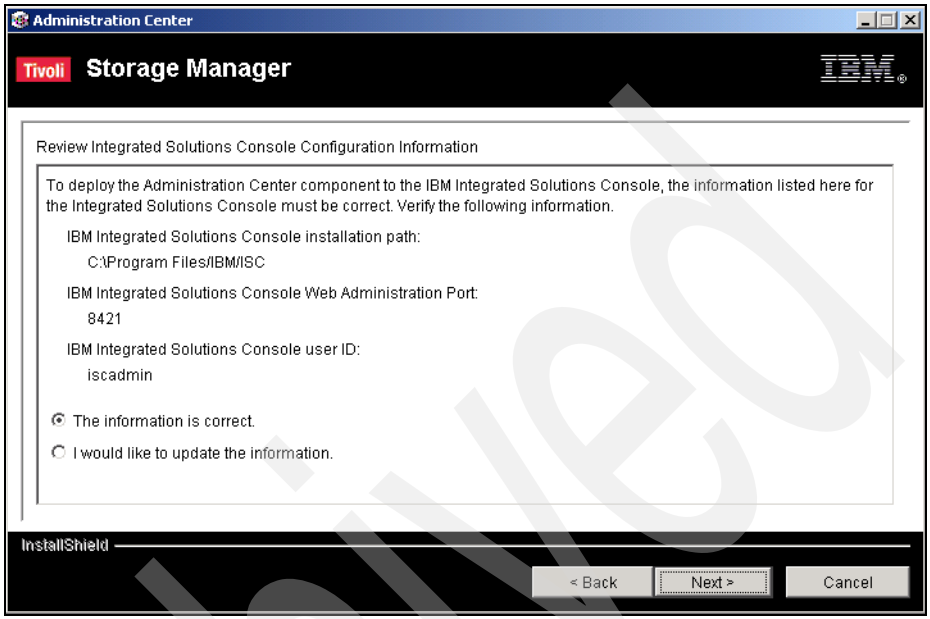


Figure 23-17 Review install path, Admin port and user ID

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.

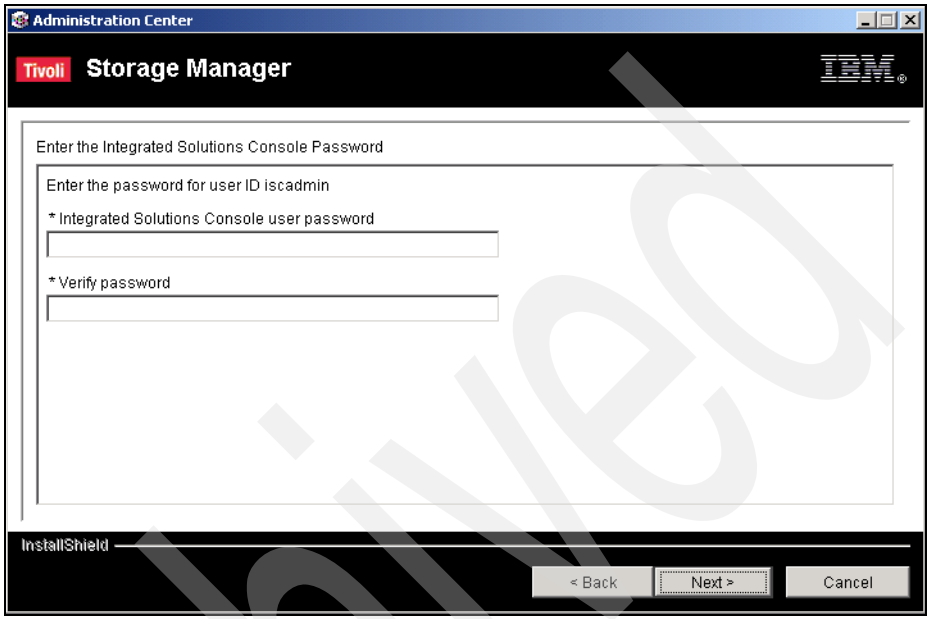


Figure 23-18 Enter ISC password

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.

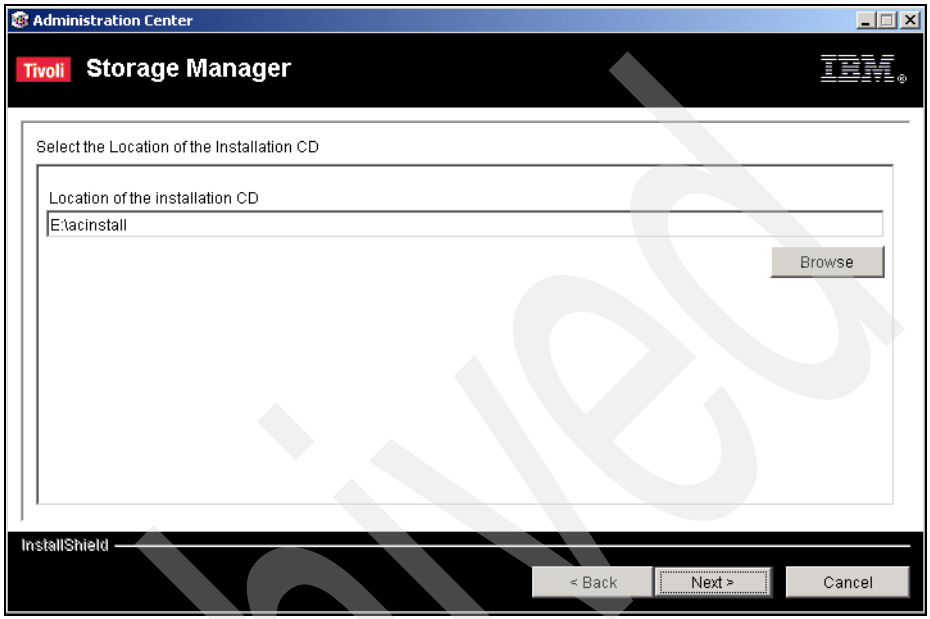


Figure 23-19 Select location of installation CD

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.

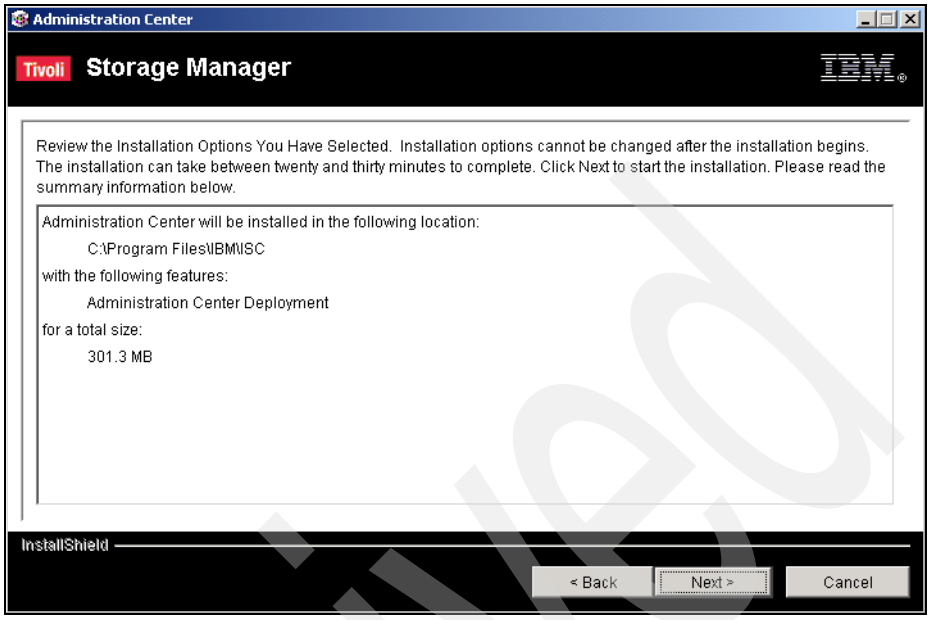


Figure 23-20 Final review of selected installation option

Figure 23-21 shows the installation beginning.

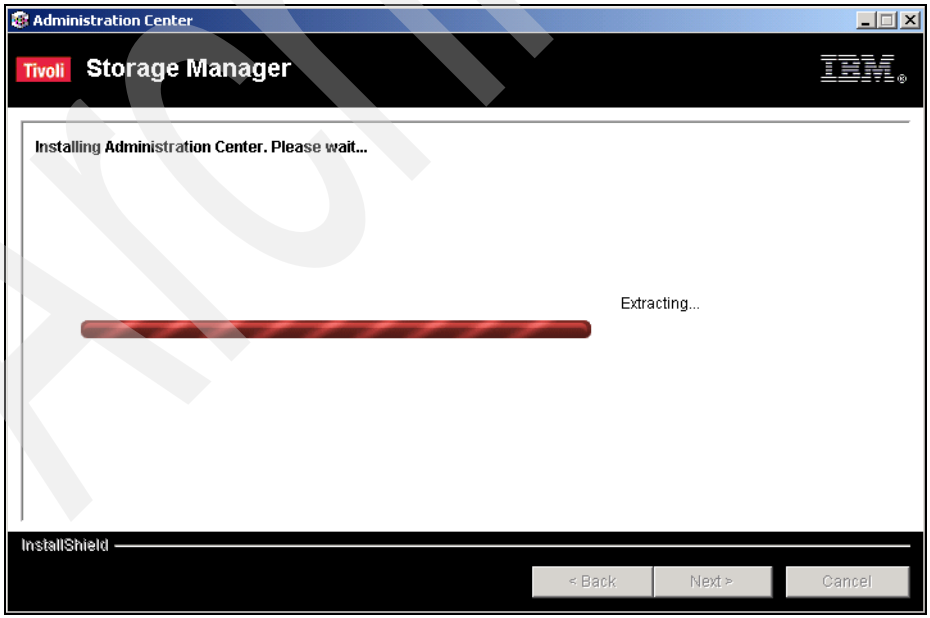


Figure 23-21 Installation commences

Figure 23-22 shows that the installation has completed successfully. Click **Next** to continue.

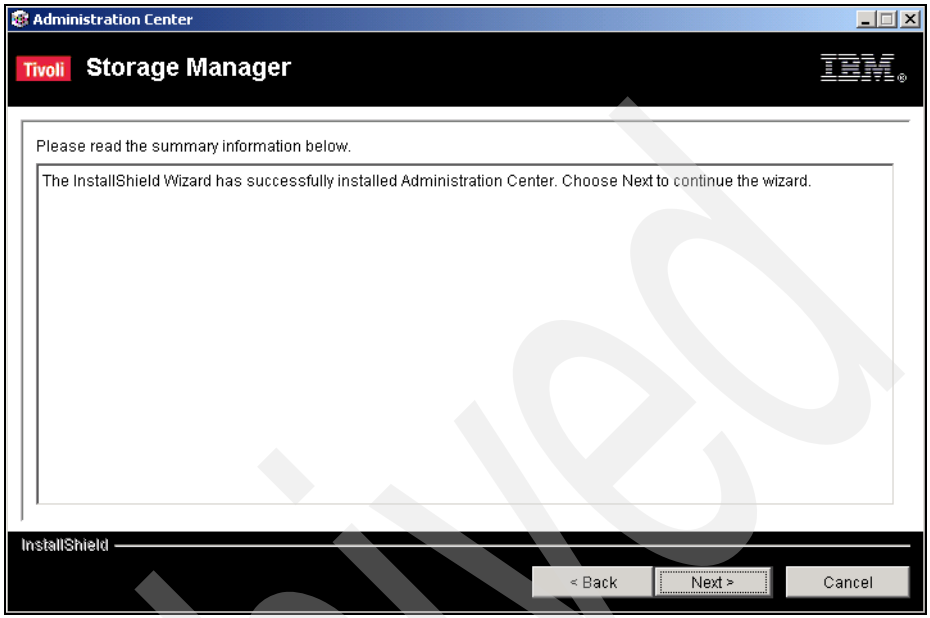


Figure 23-22 Installation successful

Figure 23-23 shows the installation summary.

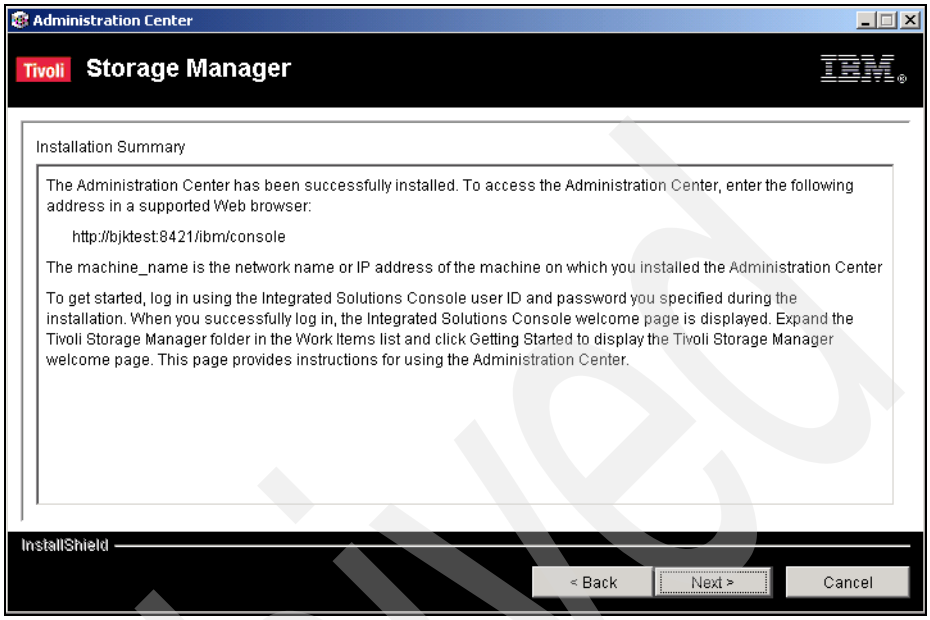


Figure 23-23 Installation summary

As with the ISC installation, the ISC is automatically launched, as shown in Figure 23-24, when you click **Next**.

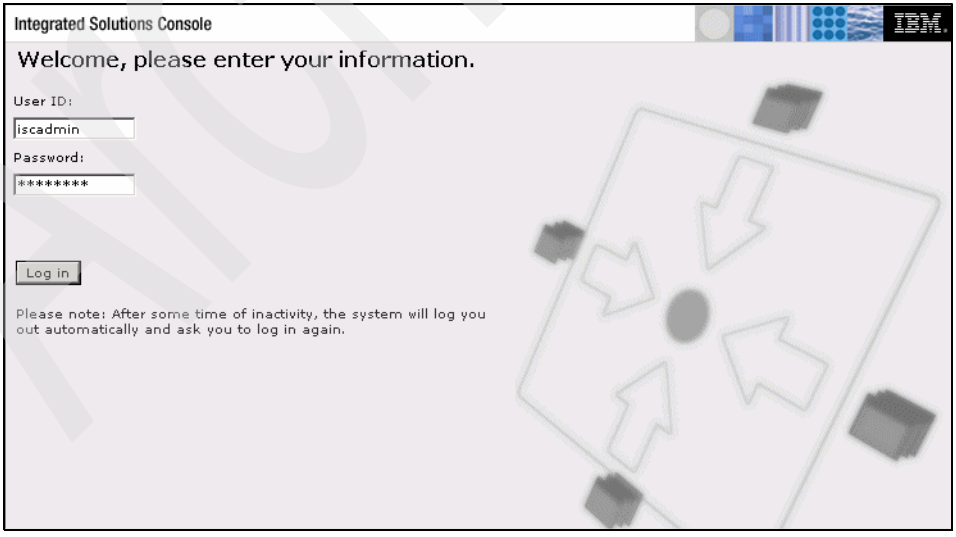


Figure 23-24 ISC Login automatically appears following install

Figure 23-25 shows the first view of the expanded Tivoli Storage Manager plugin.

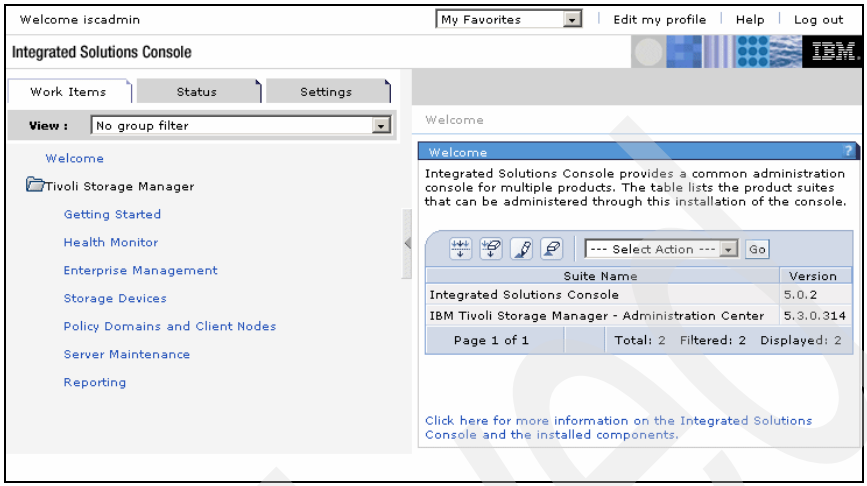


Figure 23-25 First login showing expanded Tivoli Storage Manager component

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.

Table 23-1 Restricted or unsupported commands

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 EVENTLOGGING, END EVENTLOGGING, ENABLE EVENTS, DISABLE EVENTS)	No Some SNMP options can be viewed in the interface, in a server's properties notebook
ENABLE SESSIONS	No
ESTIMATE DBREORG	No‘
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

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.

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.

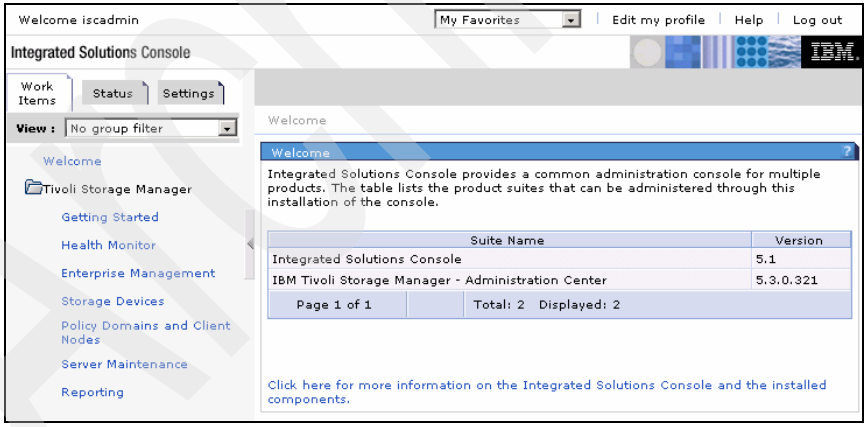


Figure 23-27 Tivoli Storage Manager plug-in expanded view

From the expanded view, clicking the Getting Started link displays the Welcome! window shown in Figure 23-28.

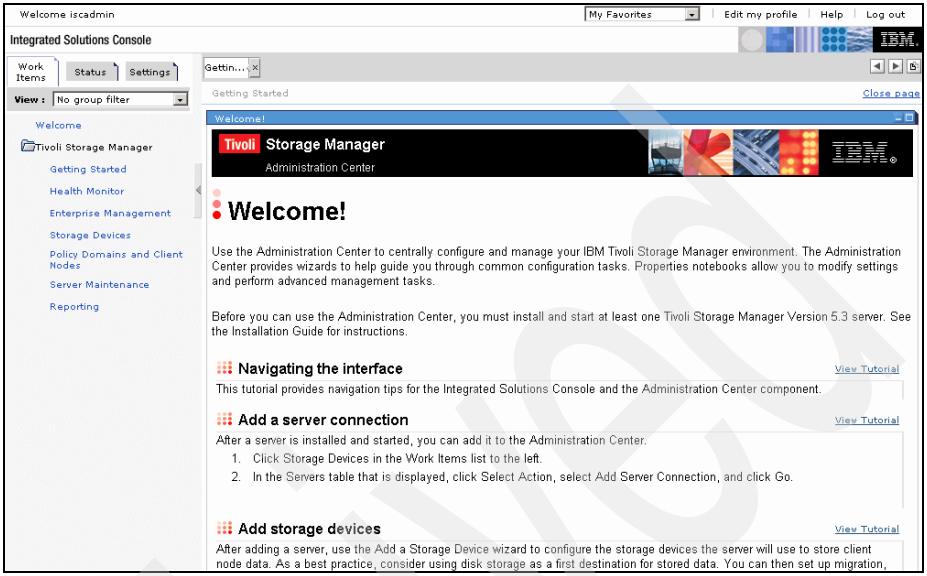


Figure 23-28 Getting Started window in ISC

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.

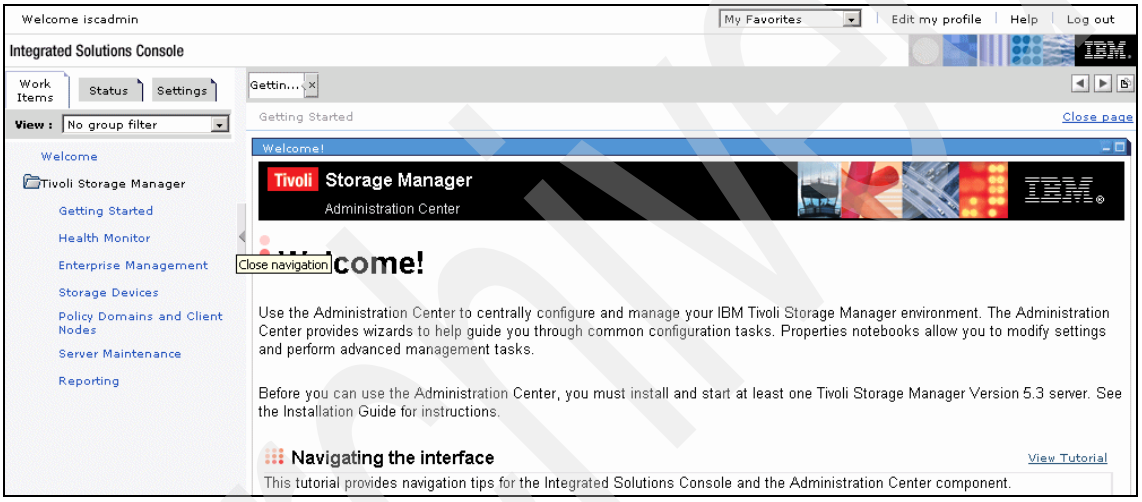


Figure 23-29 Contract navigation frame

Figure 23-30 shows the Navigation window contracted to give the portlet more space on the screen.

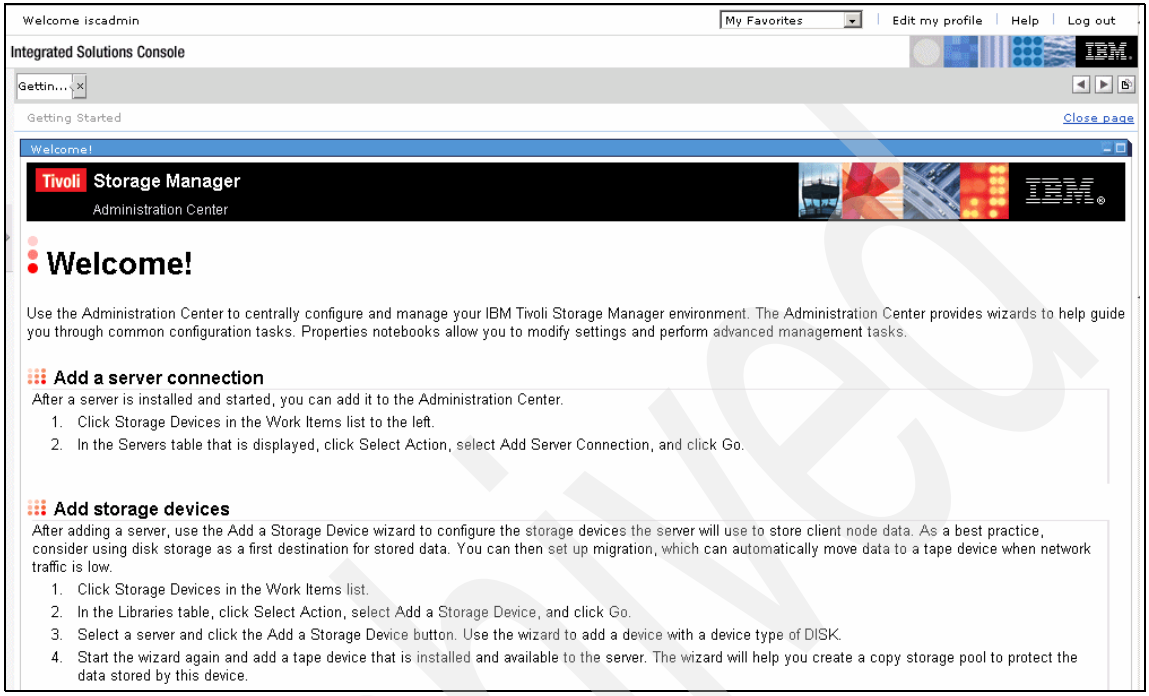


Figure 23-30 Navigation frame contracted

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.

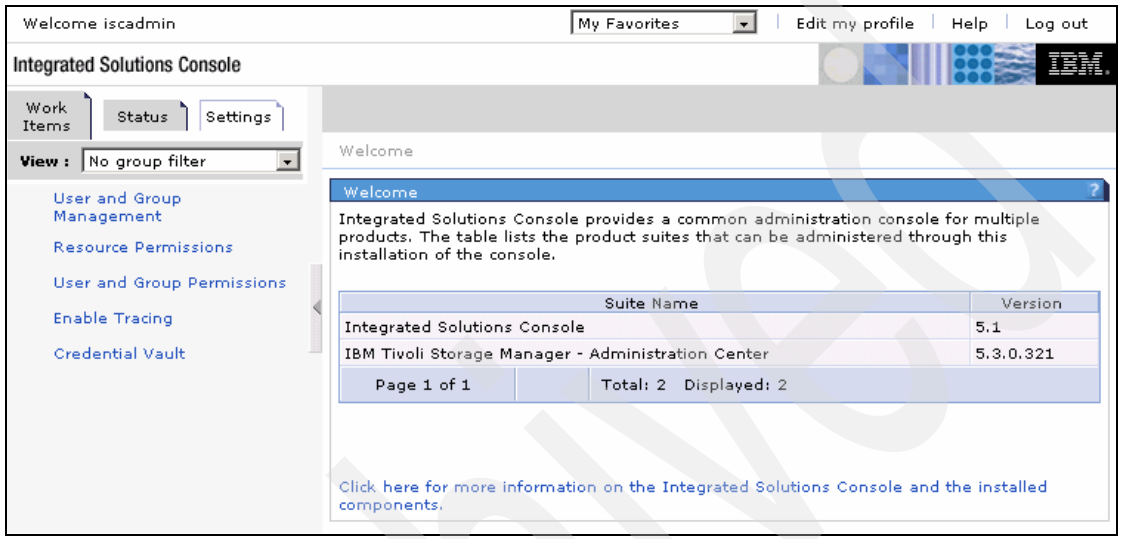


Figure 23-31 Click Settings in the Navigation Tab

2. Click **User and Group Management** in the Navigation Tree, as shown in Figure 23-32.

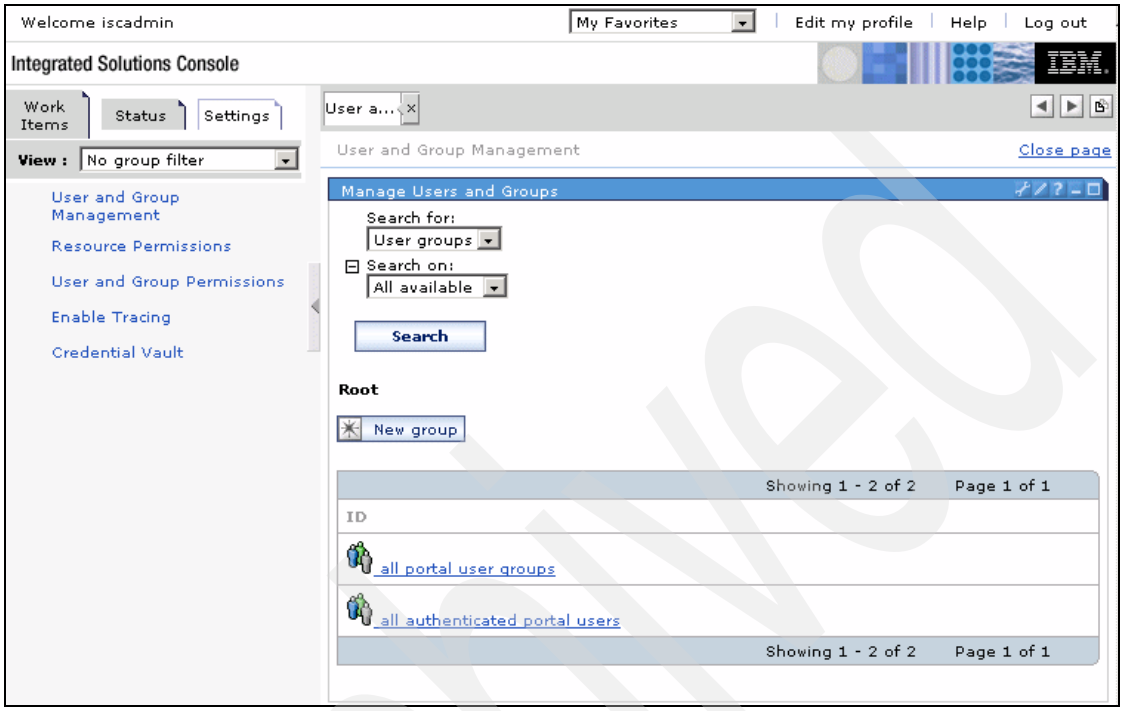


Figure 23-32 Manage Users and Groups portlet

3. Click “**all authenticated portal users**”, as shown in Figure 23-33.

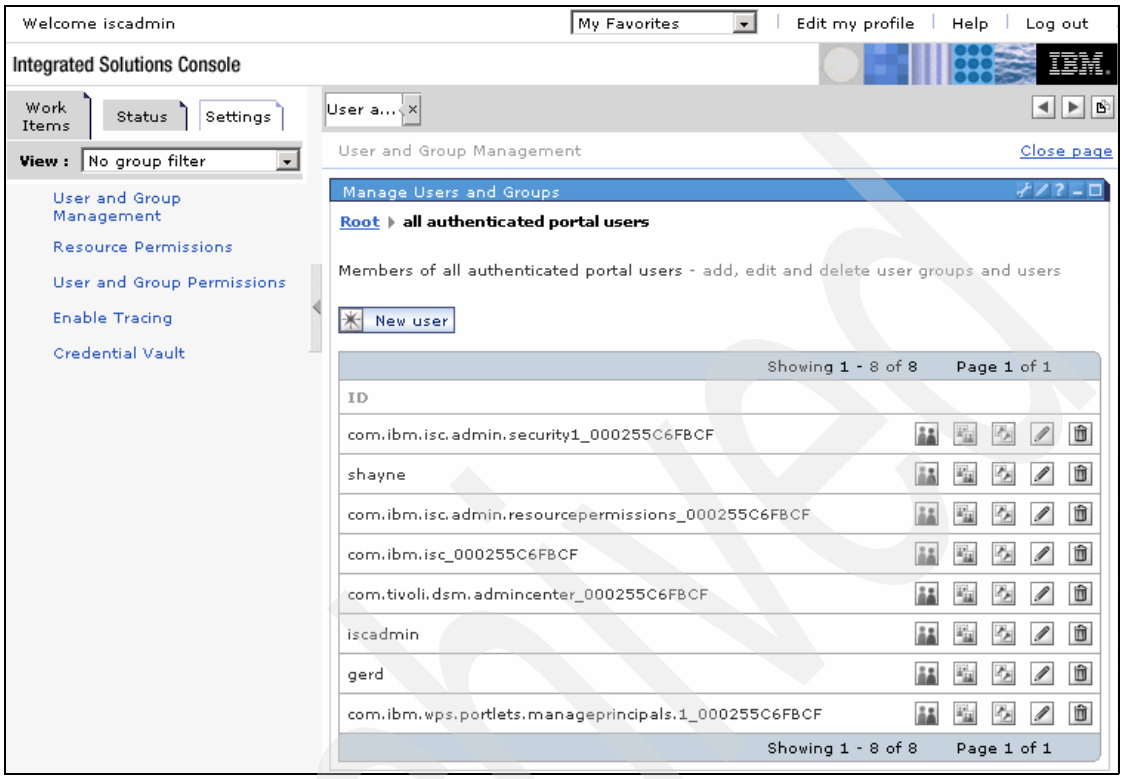


Figure 23-33 All authenticated users view

4. Click the **New user** button, as shown in Figure 23-34.

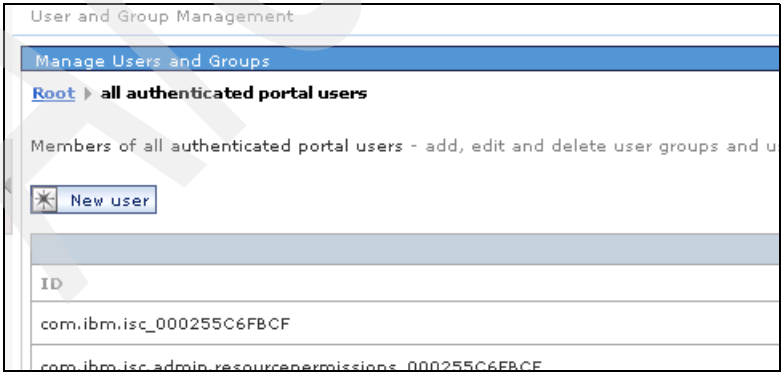


Figure 23-34 New user button

5. Enter the details of the new ISC administrator, as shown in Figure 23-35.

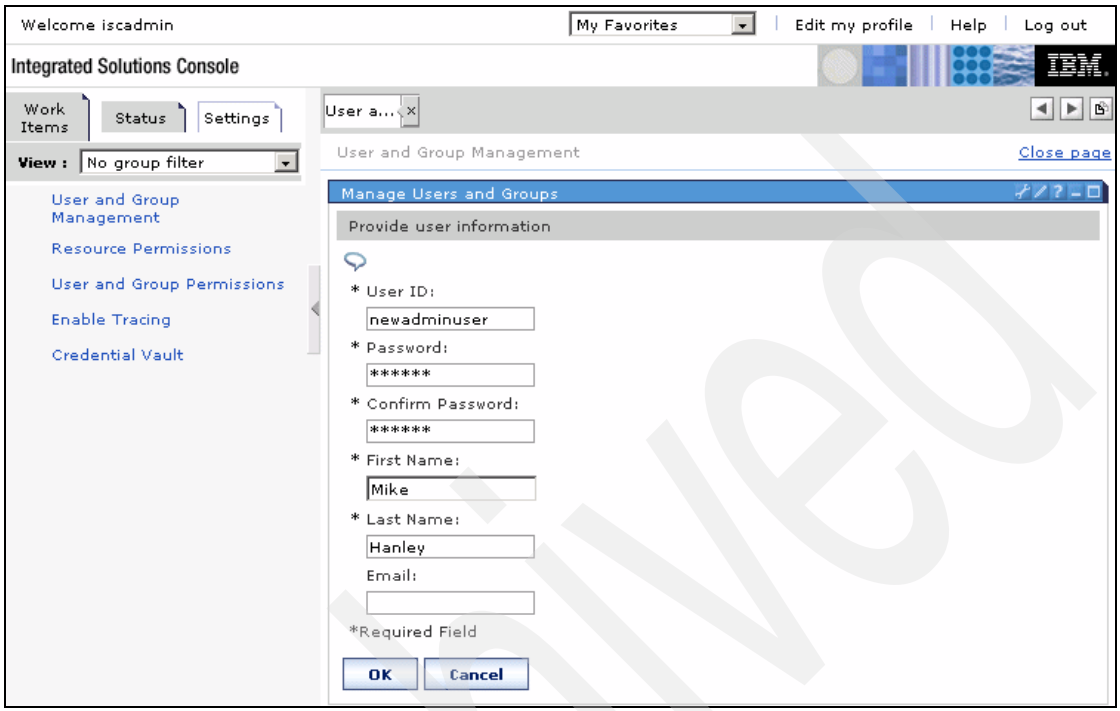


Figure 23-35 ISC Admin user details

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.

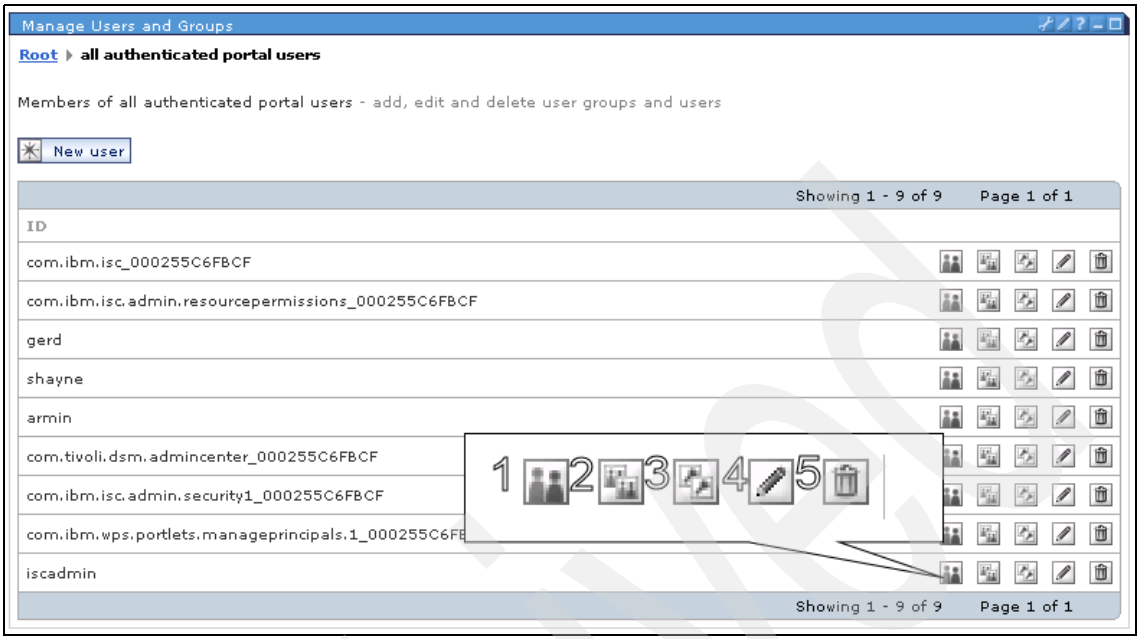


Figure 23-36 All authenticated portal users Icons

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.

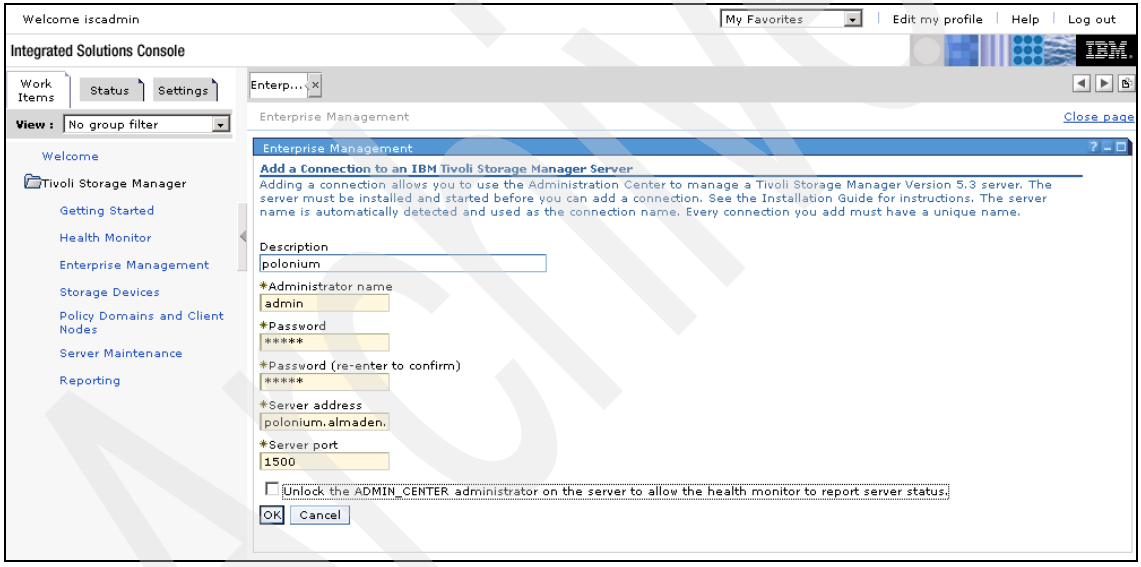


Figure 23-37 Enter server name and admin details

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.

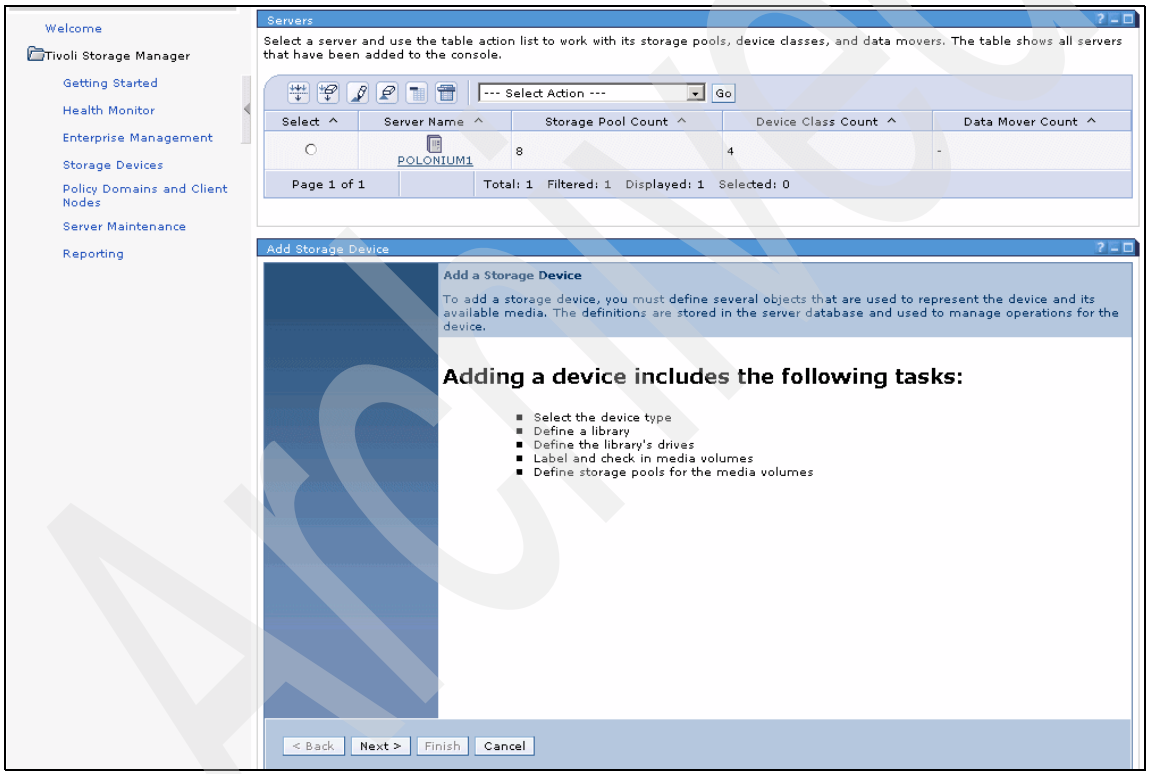


Figure 23-38 Add Storage Device wizard

5. Click **Next** to start the wizard and the initial window will be shown as seen in Figure 23-39.

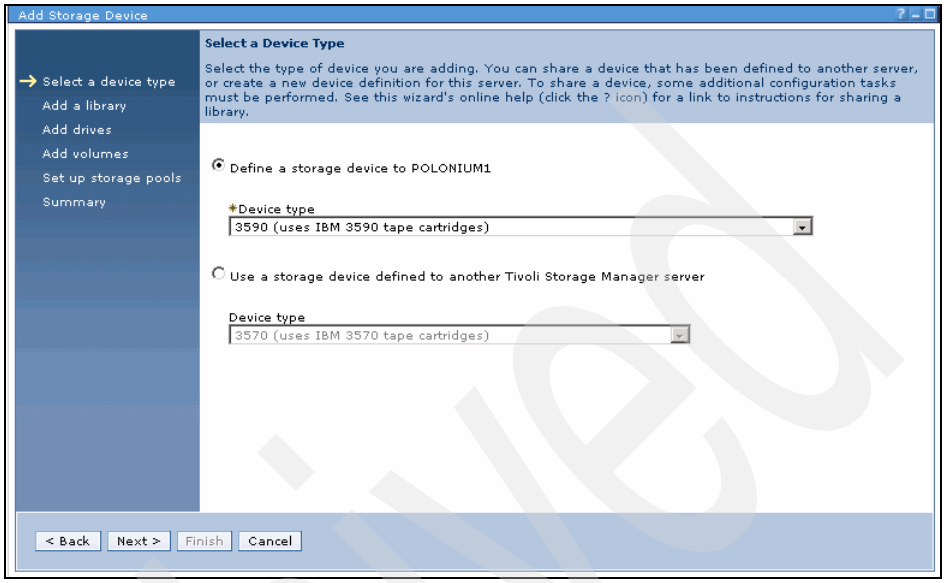


Figure 23-39 Select Device Type

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.

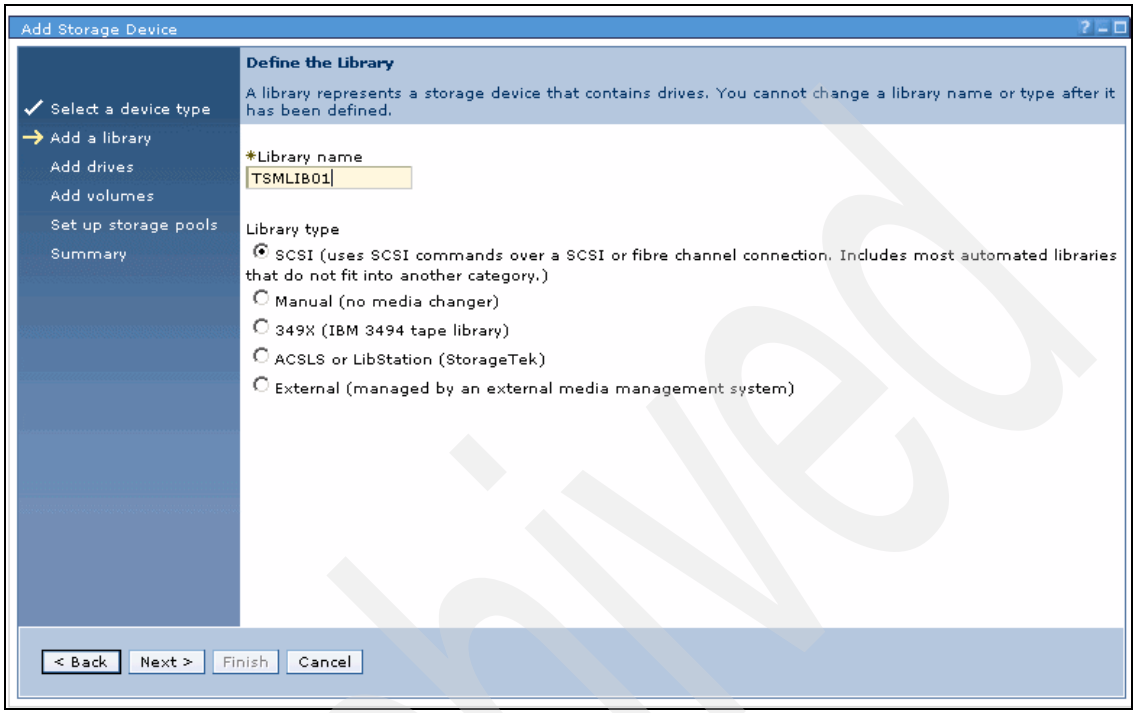


Figure 23-40 Define Library

7. Enter the library name and type and click **Next** to display the SCSI library settings window illustrated next in Figure 23-41.

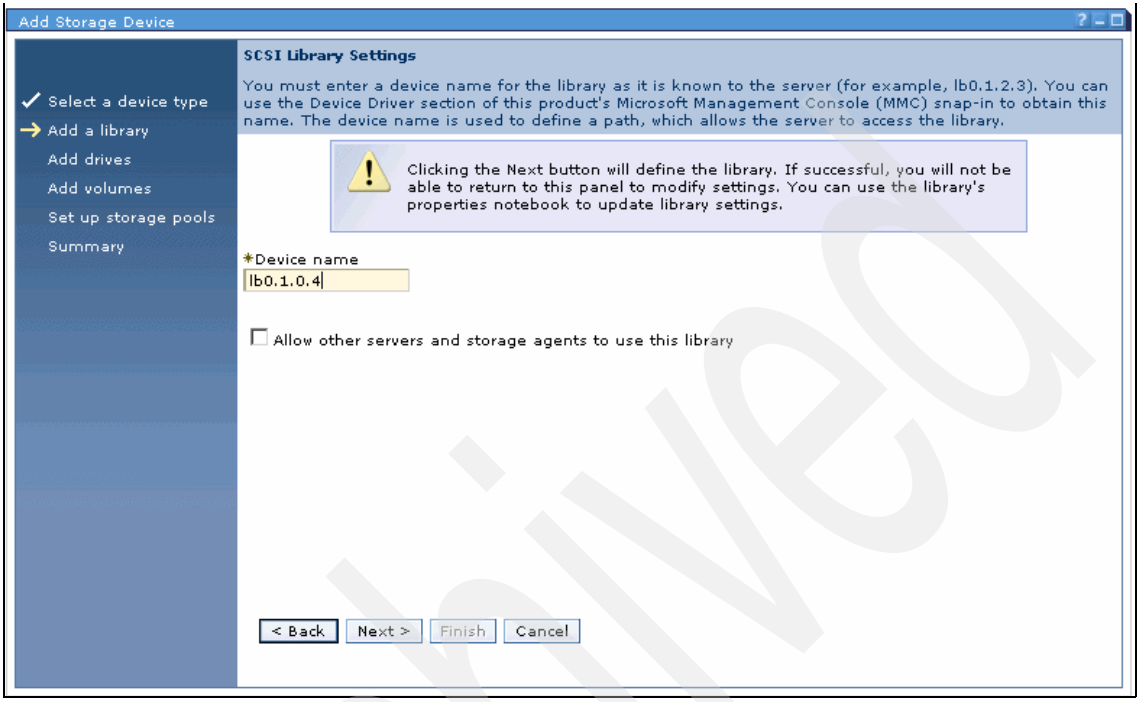


Figure 23-41 Define SCSI settings

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.

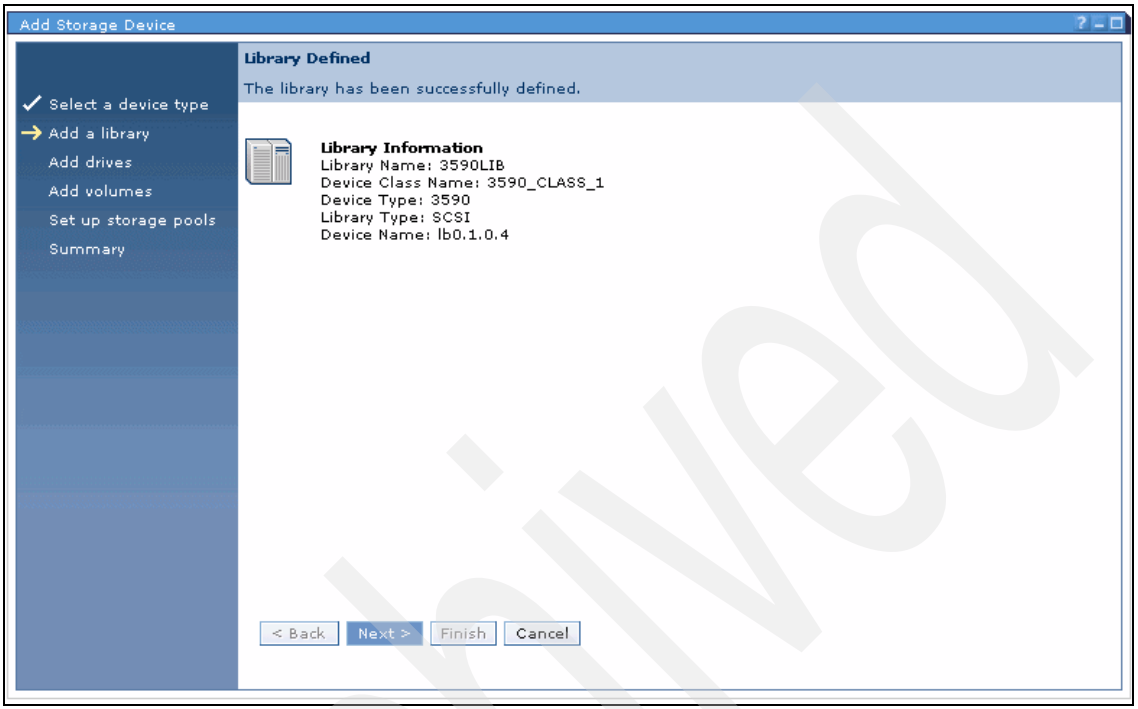


Figure 23-42 Library successfully defined

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**.

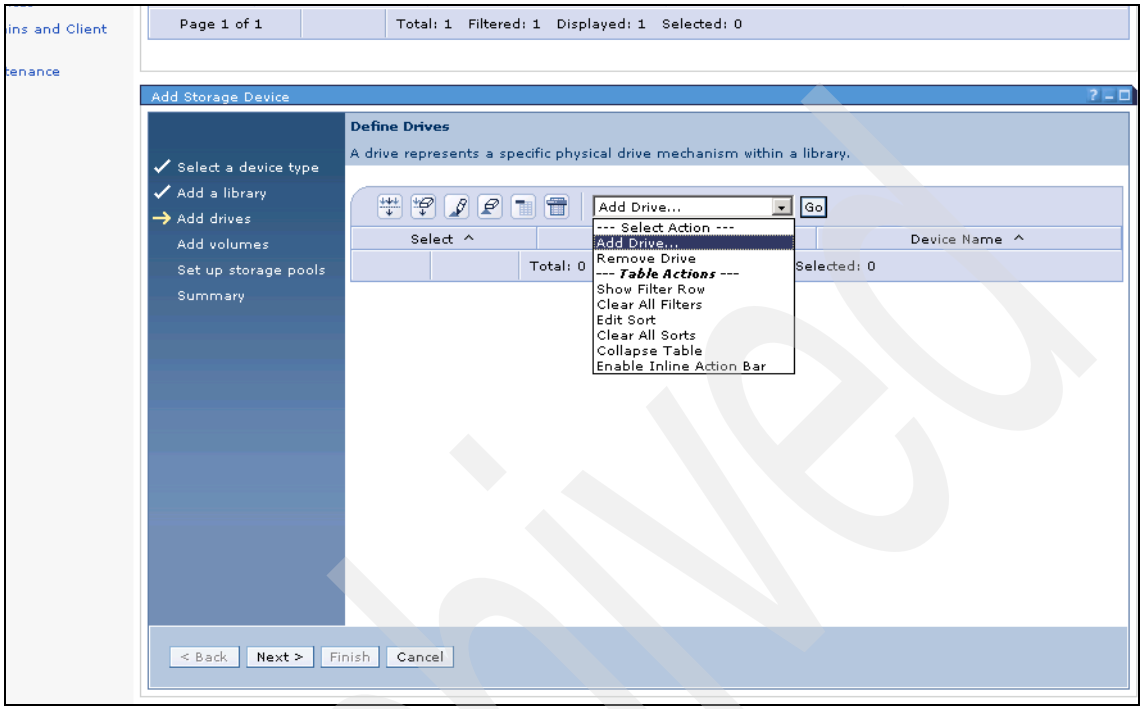


Figure 23-43 Add Drive

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.

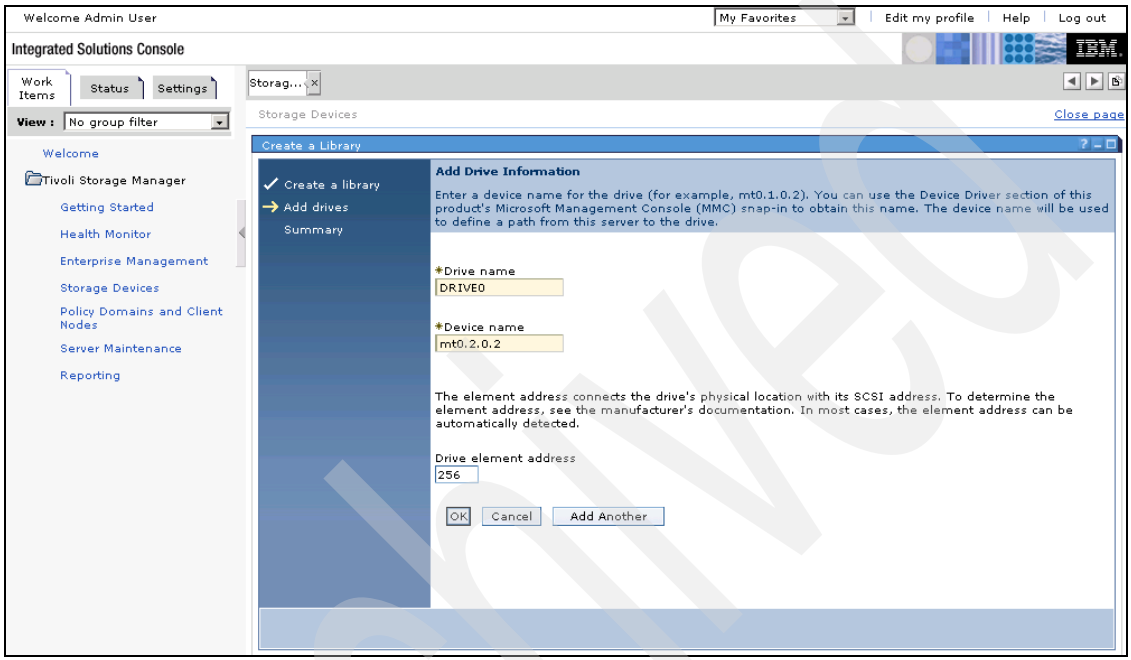


Figure 23-44 Add drive detail

12.]The window shown in Figure 23-45 is displayed once all the drives have been added.

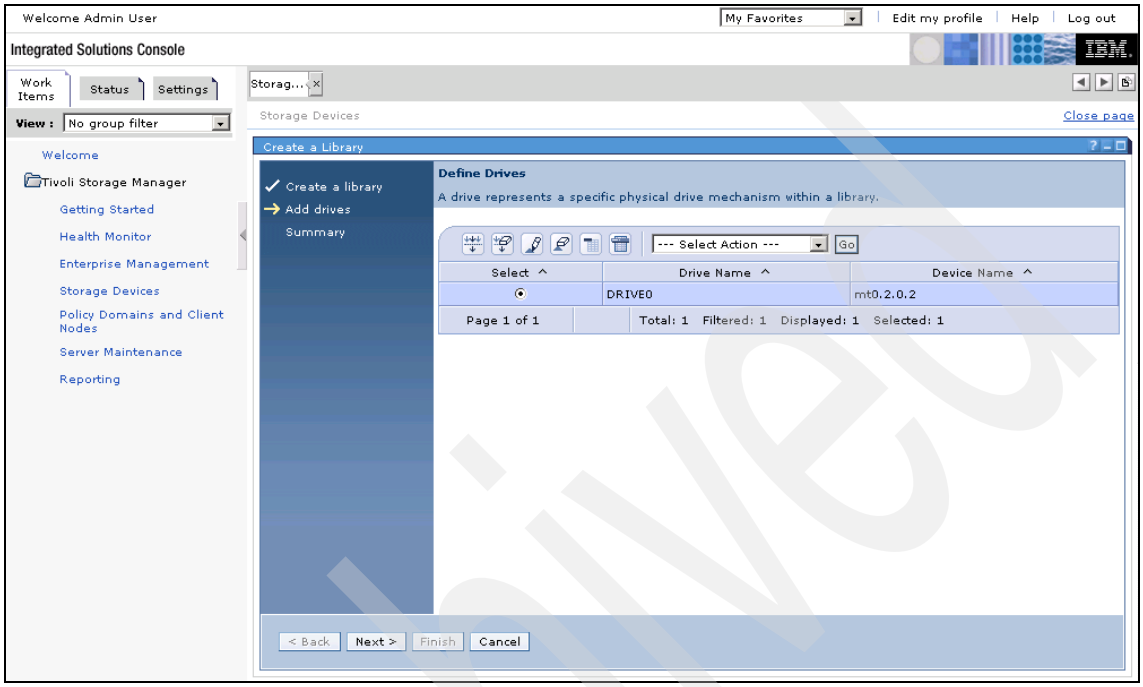


Figure 23-45 Drive added

13.Click **Next** to proceed to the **Library Created Successfully** page shown in Figure 23-46.

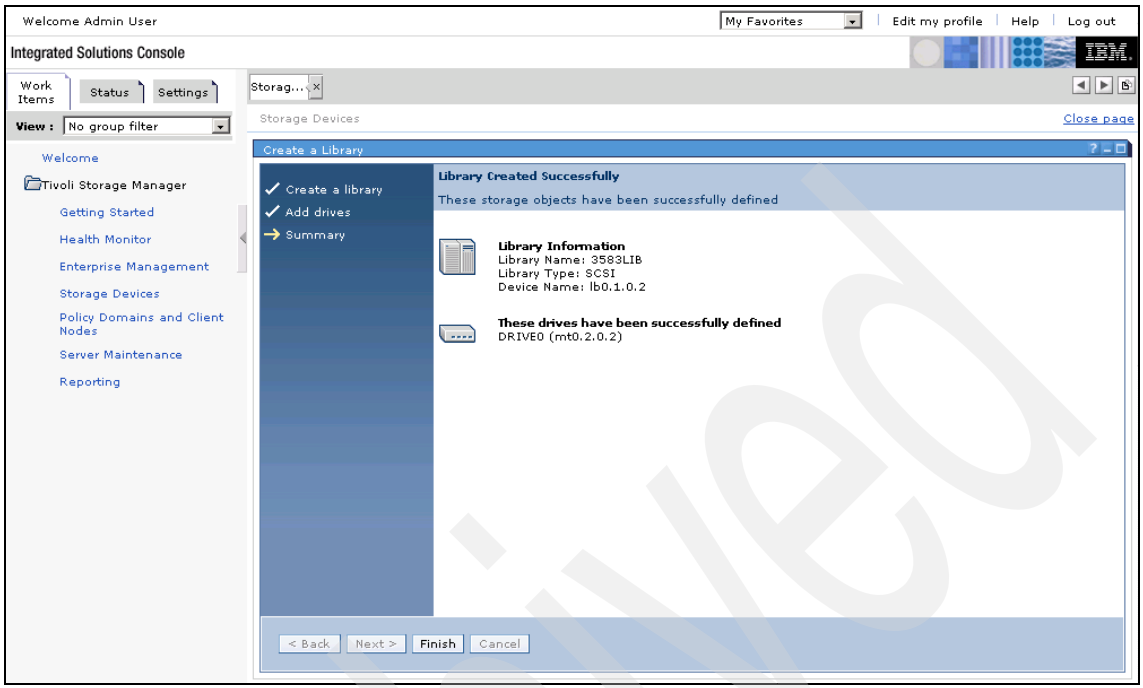


Figure 23-46 Wizard completed

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**.

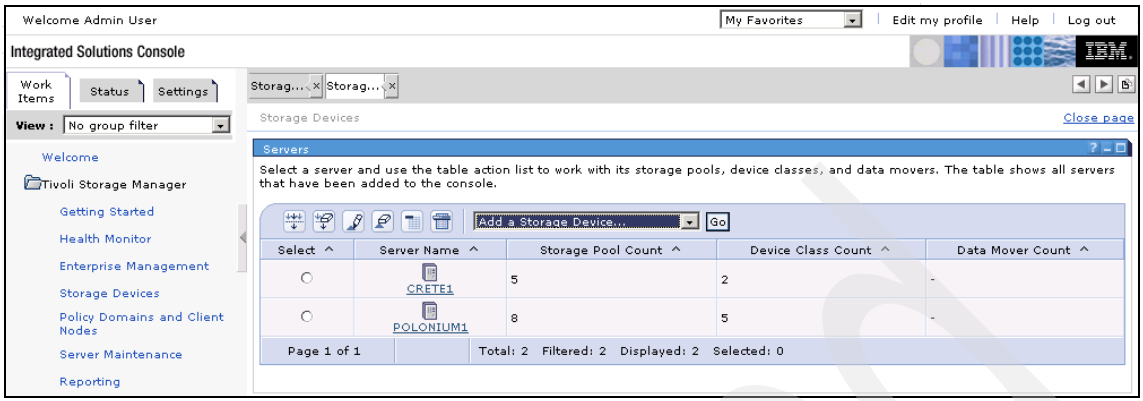


Figure 23-47 Add a Storage Device drop-down menu

The Wizard should now be displayed as seen in Figure 23-48.

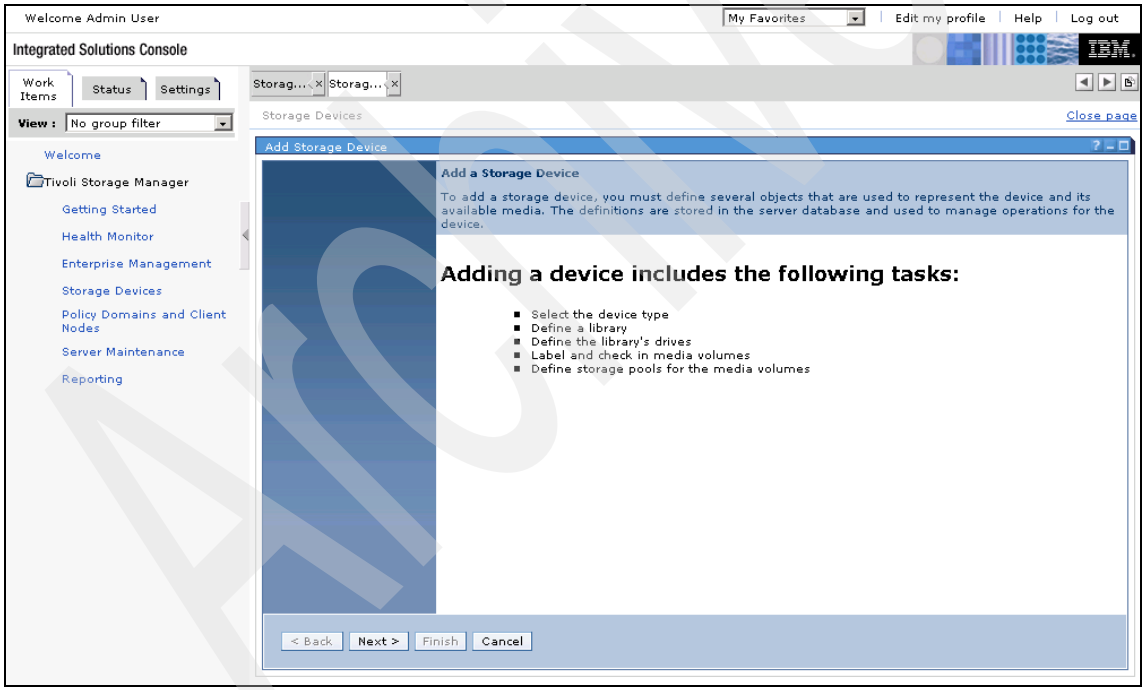


Figure 23-48 Add a Storage Device Wizard

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.

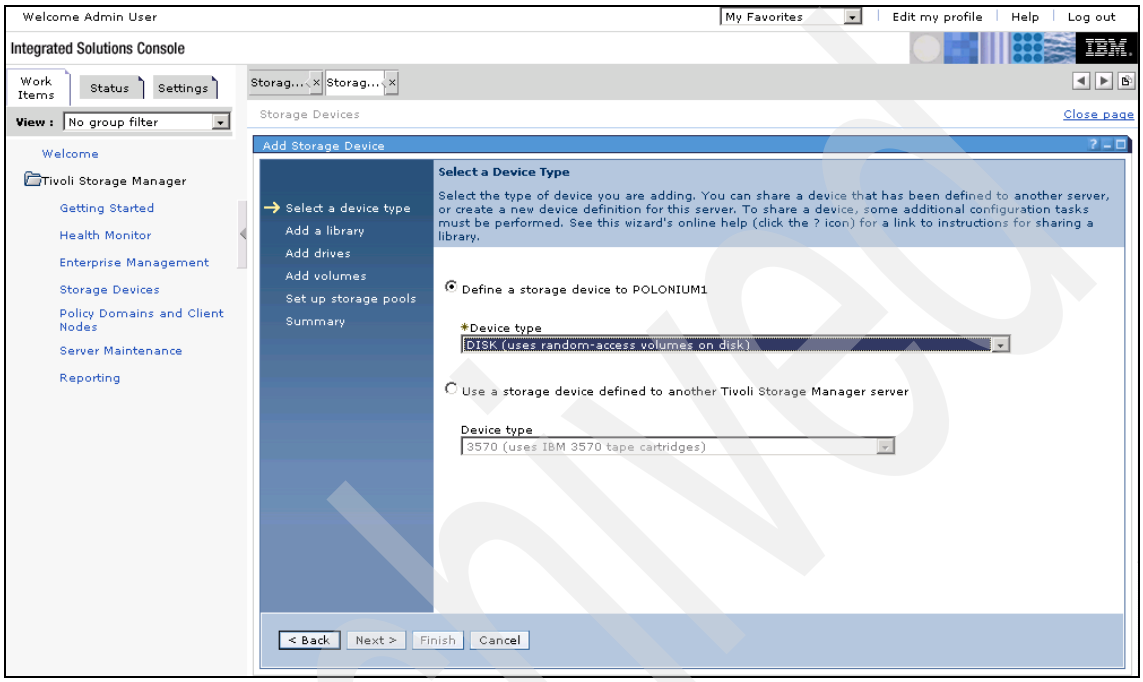


Figure 23-49 Choose device type and location

6. Define the volume, as shown in Figure 23-50.

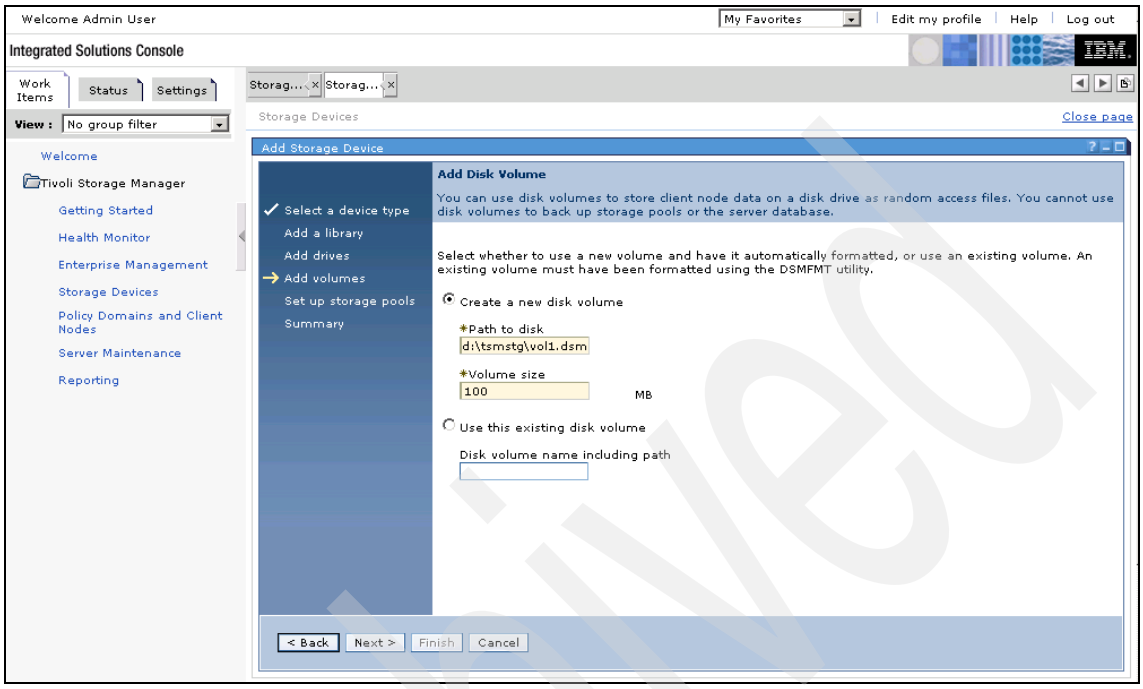


Figure 23-50 Create or Add volume

7. Figure 23-51 shows the Add Storage Device window during new storage pool creation.

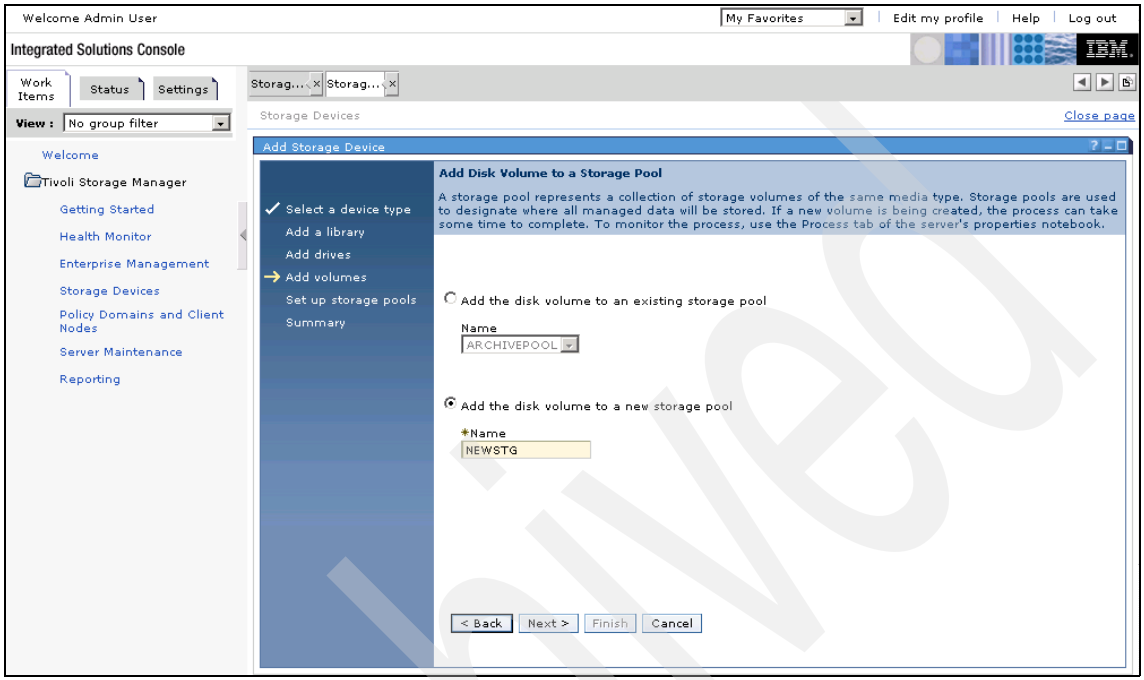


Figure 23-51 Add to existing or new storage pool

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.

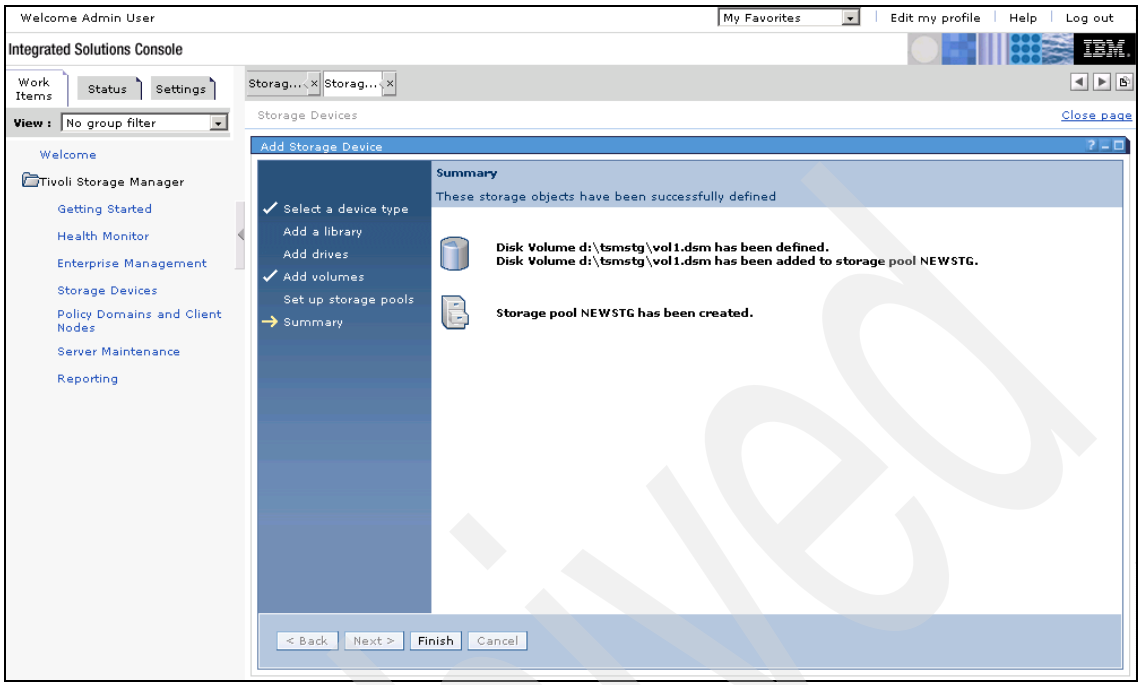


Figure 23-52 Successful completion of wizard

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**.

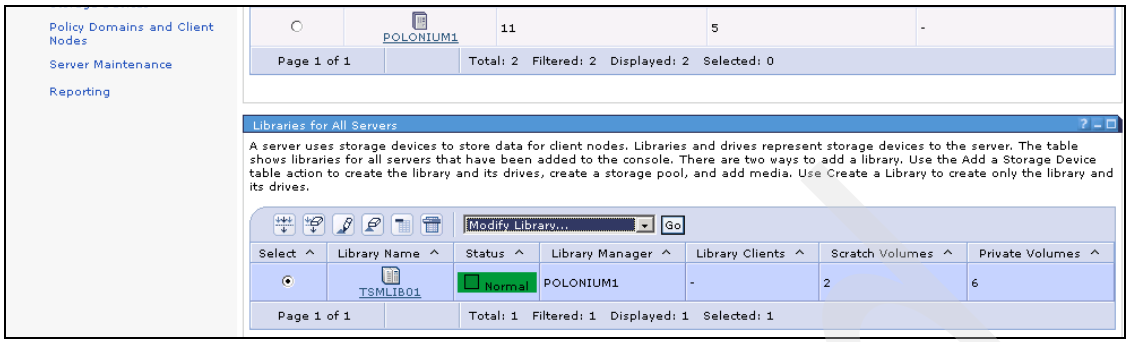


Figure 23-53 Modify Library drop-down selected

4. In the **Library properties** portlet, click **Drives** to open the portlet as seen in Figure 23-54.

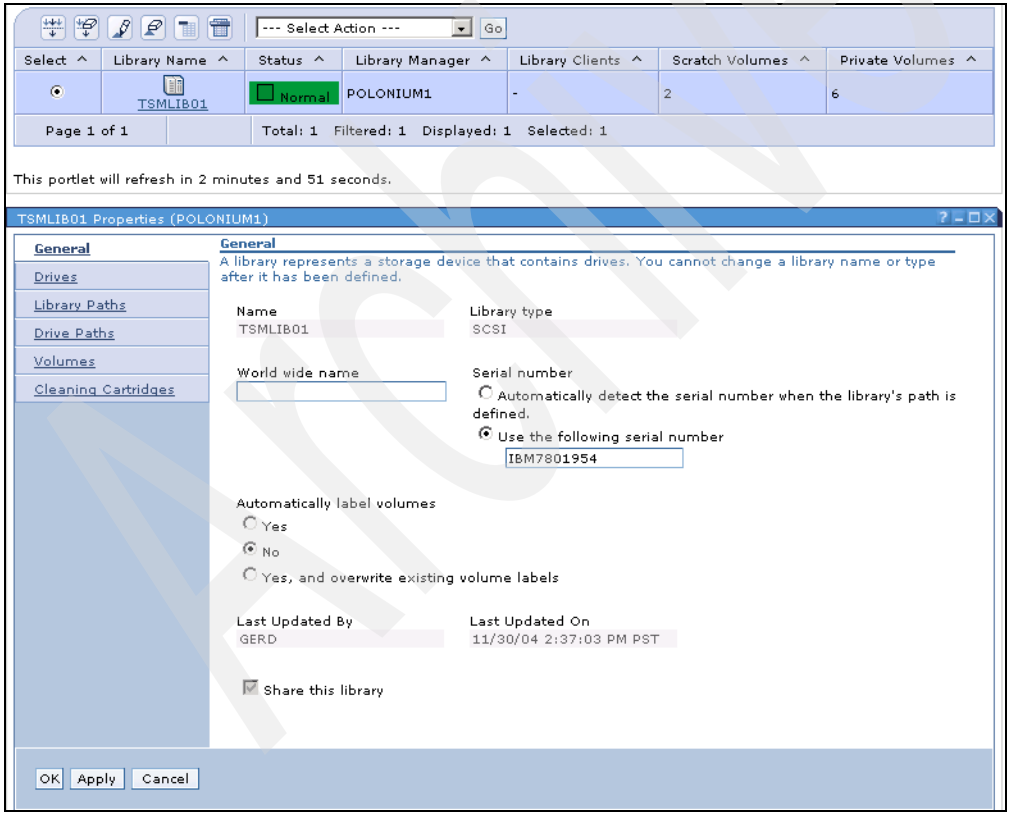


Figure 23-54 Library properties portlet

5. Choose Add a Drive from the drop-down menu, as shown in Figure 23-55, and click **Go**.

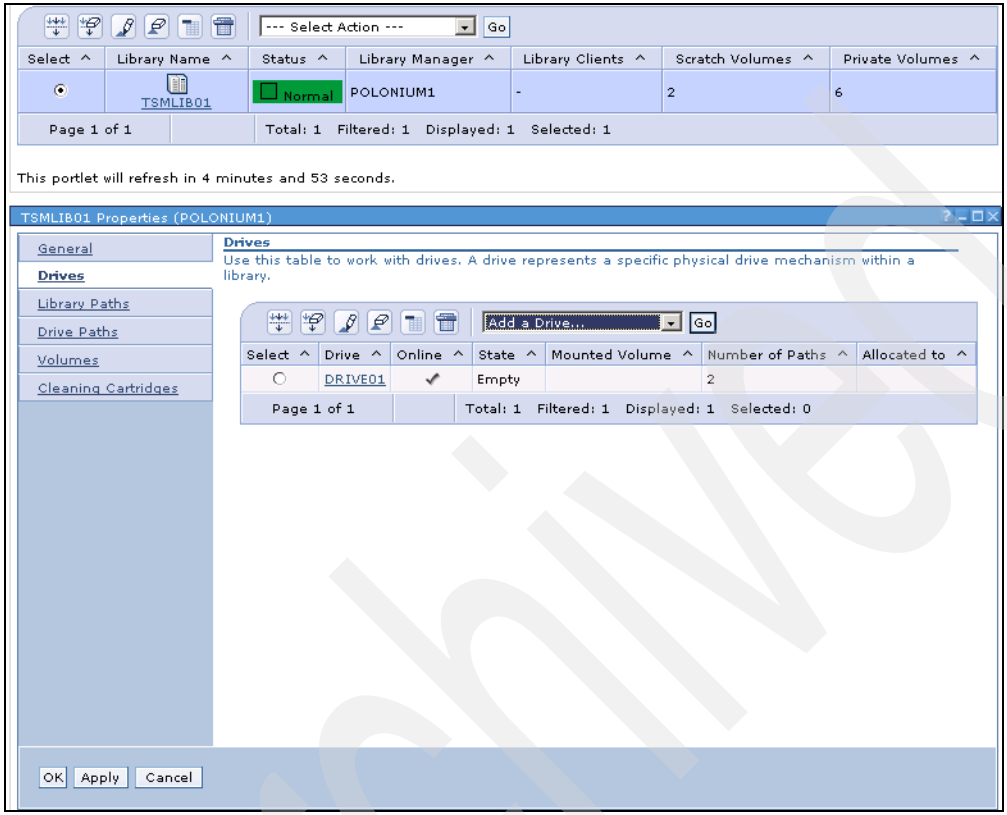


Figure 23-55 Add drive drop-down menu

6. Enter the drive details, including element number and cleaning regime. A screen capture of this process is illustrated in Figure 23-56.

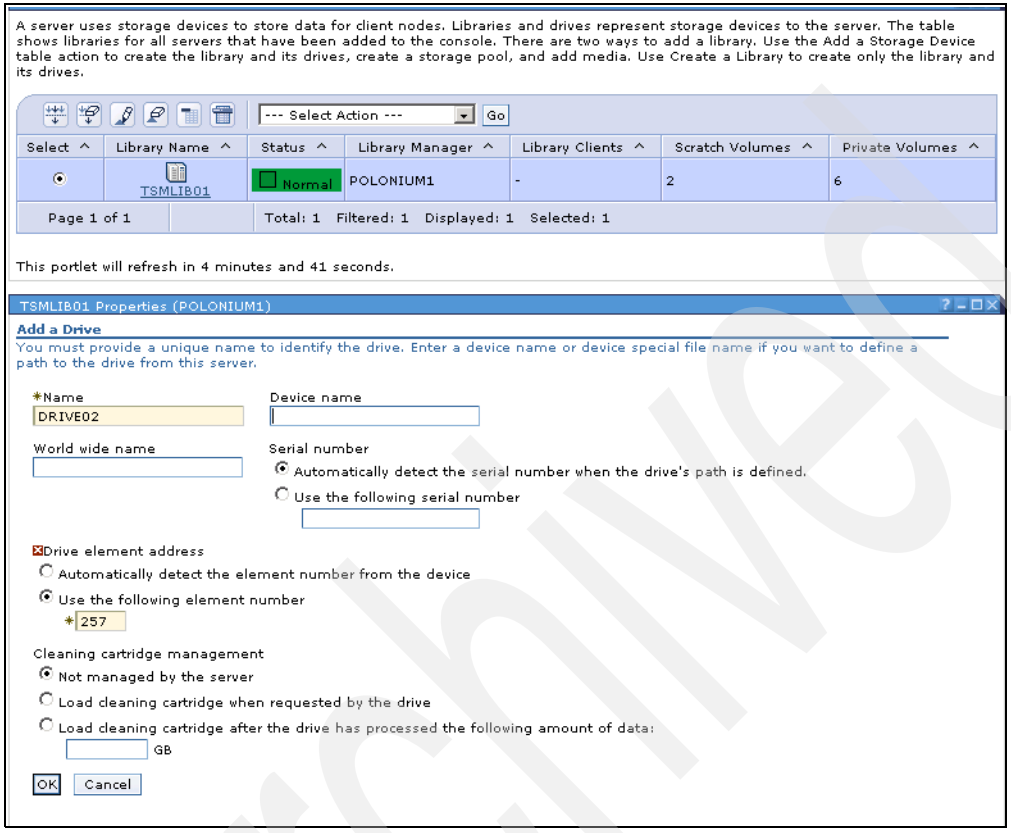


Figure 23-56 Enter drive details

7. Notification is given when the drive is added successfully, as shown in Figure 23-57.

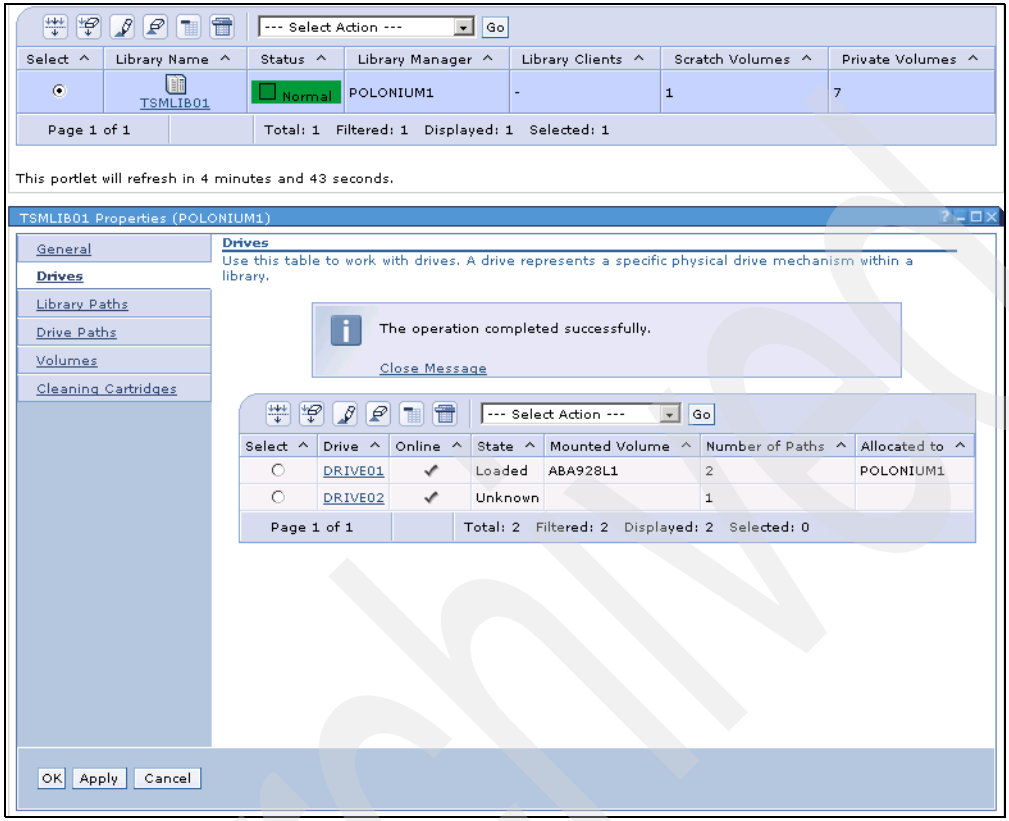


Figure 23-57 Drive successfully added

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.

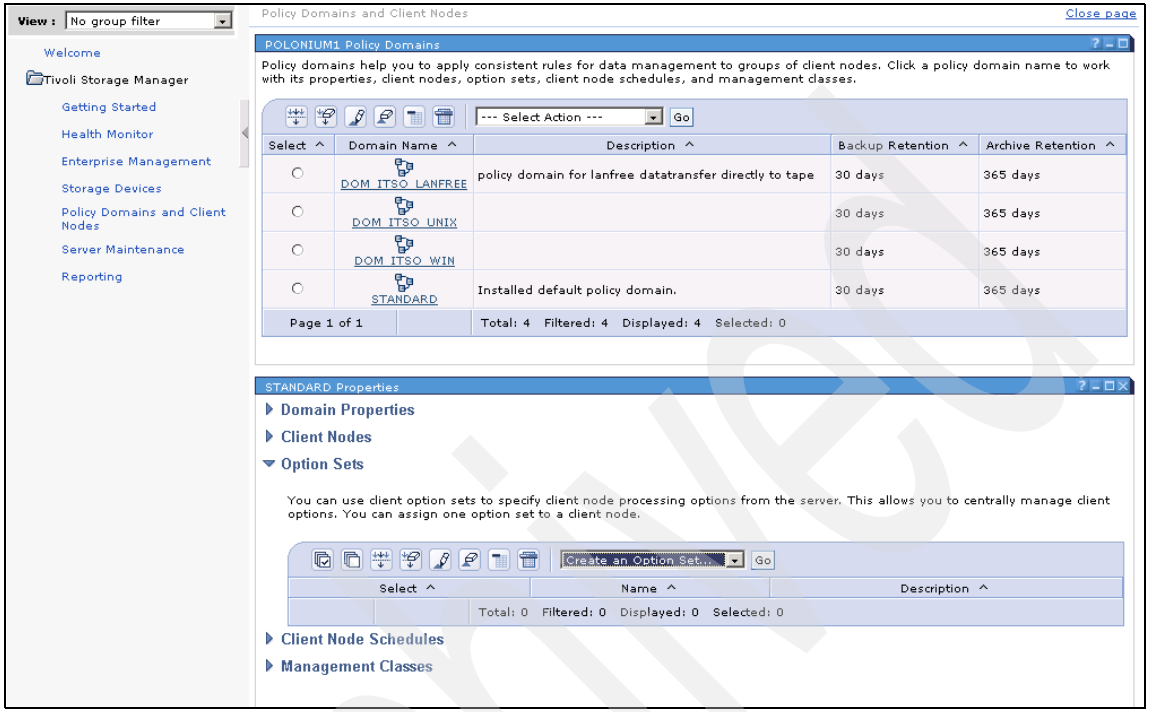


Figure 23-58 Policy Domain properties during option set creation

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.
7. 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**.

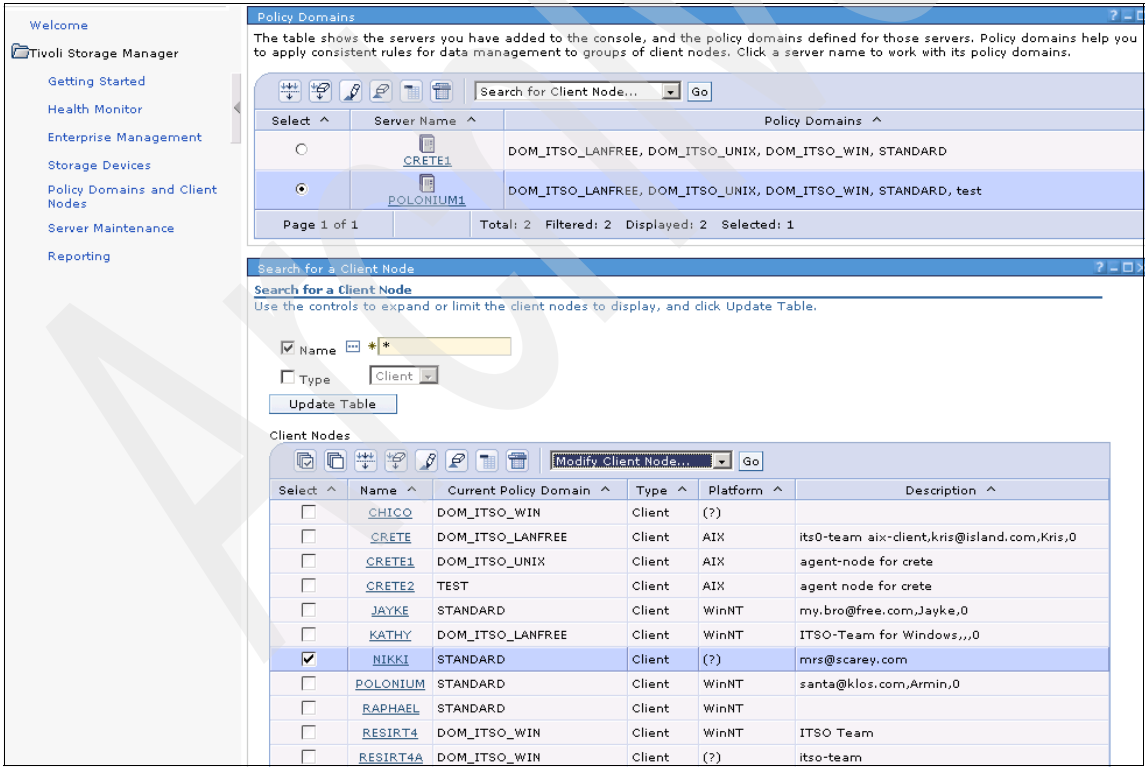


Figure 23-59 Search for client node

6. Choose **Security** in the Client Properties portlet and you will be presented with the window shown in Figure 23-60.

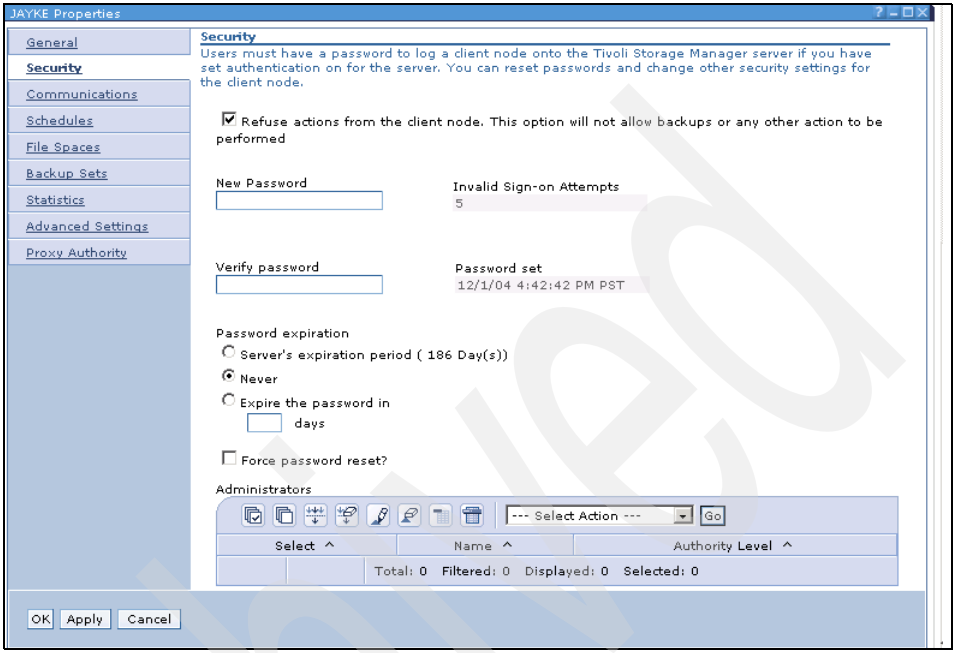


Figure 23-60 Uncheck the Refuse actions check box

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.

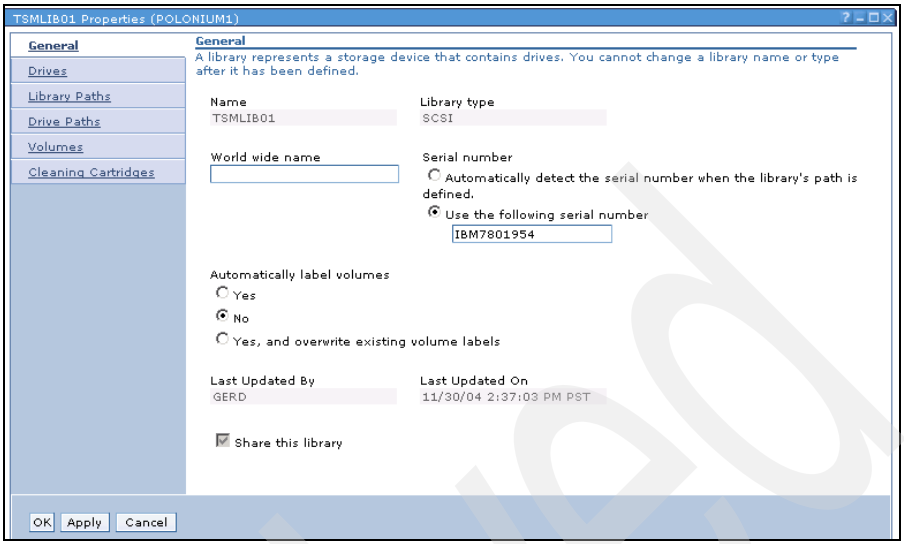


Figure 23-61 Library properties portlet

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**.

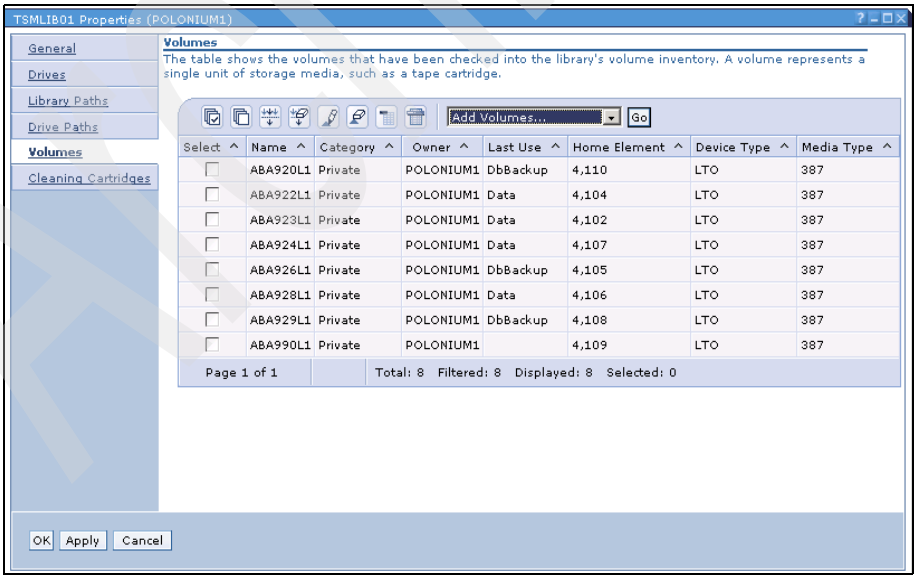


Figure 23-62 Add volumes drop-down

5. The Add volumes wizard is then launched, as shown in Figure 23-63.

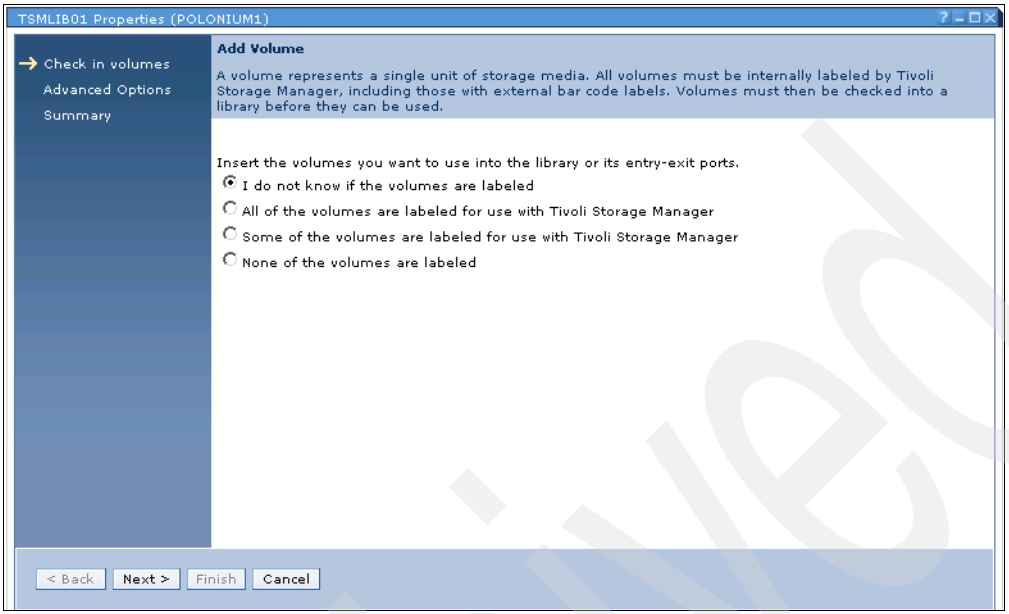


Figure 23-63 Add volumes wizard

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.

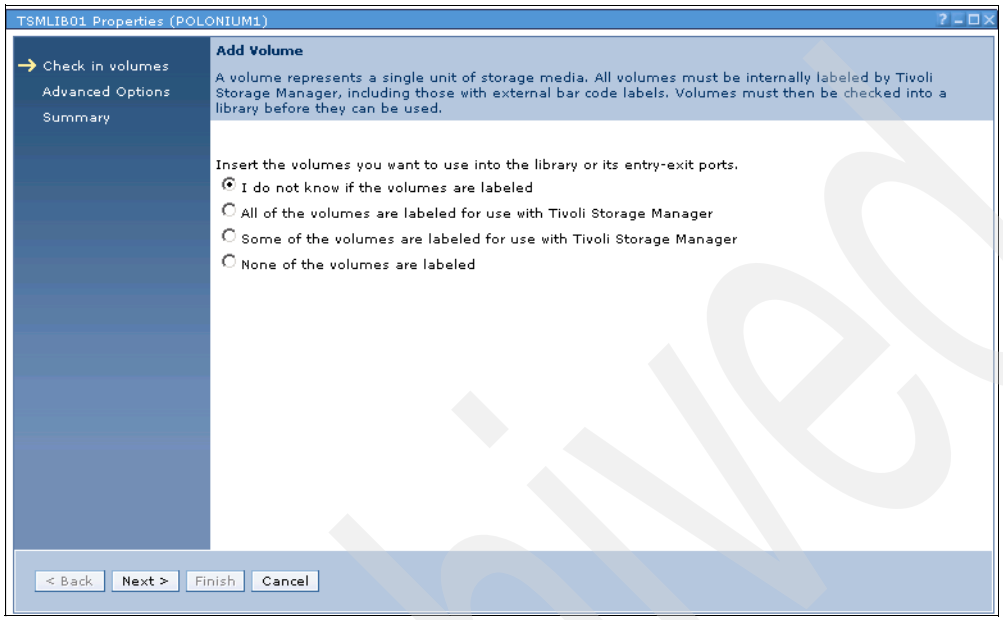


Figure 23-64 Add volumes labelling details

8. Choose how to label and check in the volumes. Note that overwrite is not enabled by default, as shown in Figure 23-65.

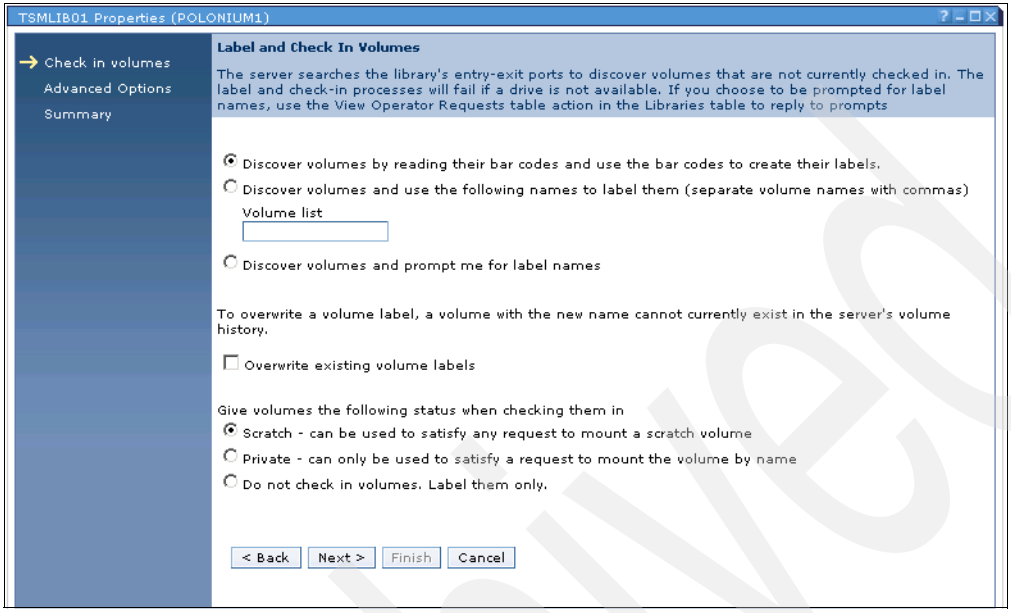


Figure 23-65 Label and check in volumes

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.

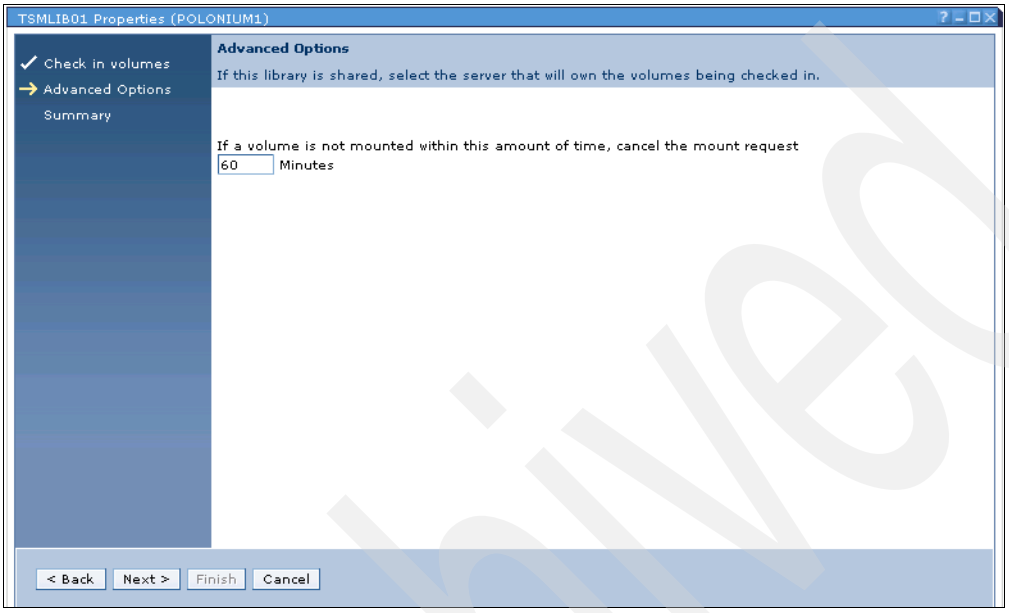


Figure 23-66 Set waittime for mounts

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.

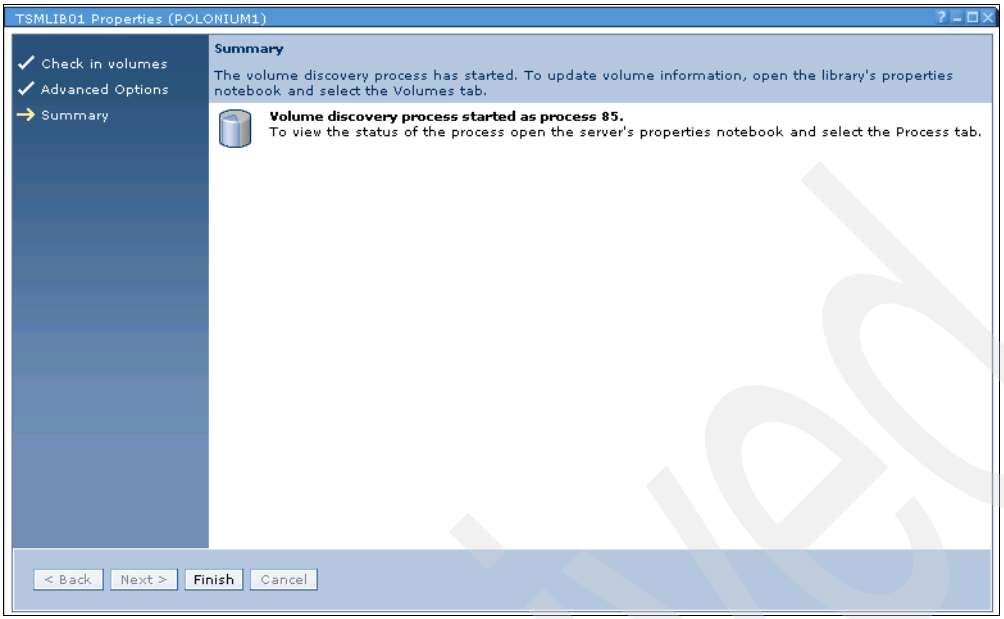


Figure 23-67 Discovery process started

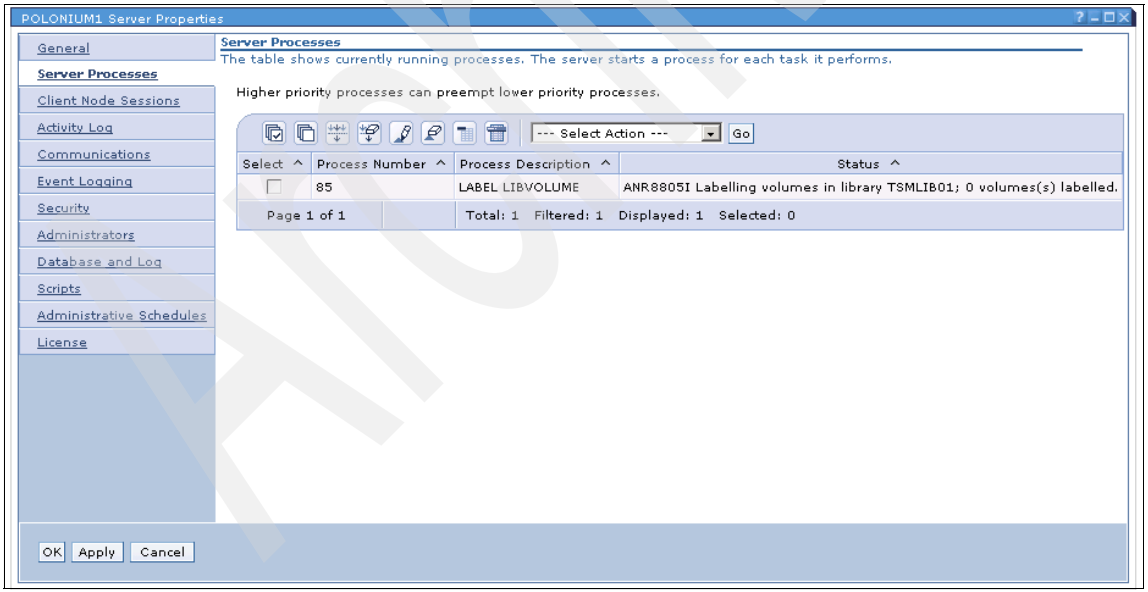


Figure 23-68 Server process status

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.

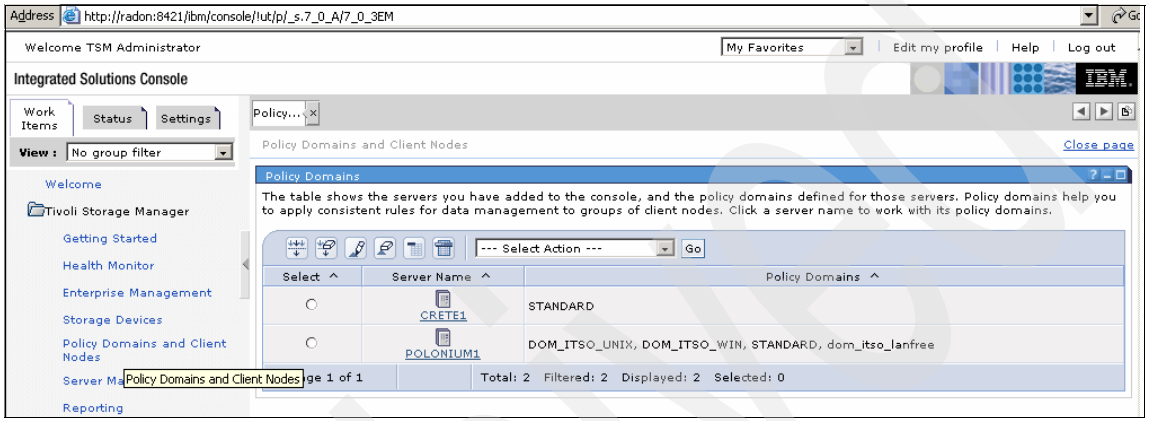


Figure 23-69 Policy Domains and Client Nodes

2. Select the server whose client you wish to access by clicking the appropriate radio button.

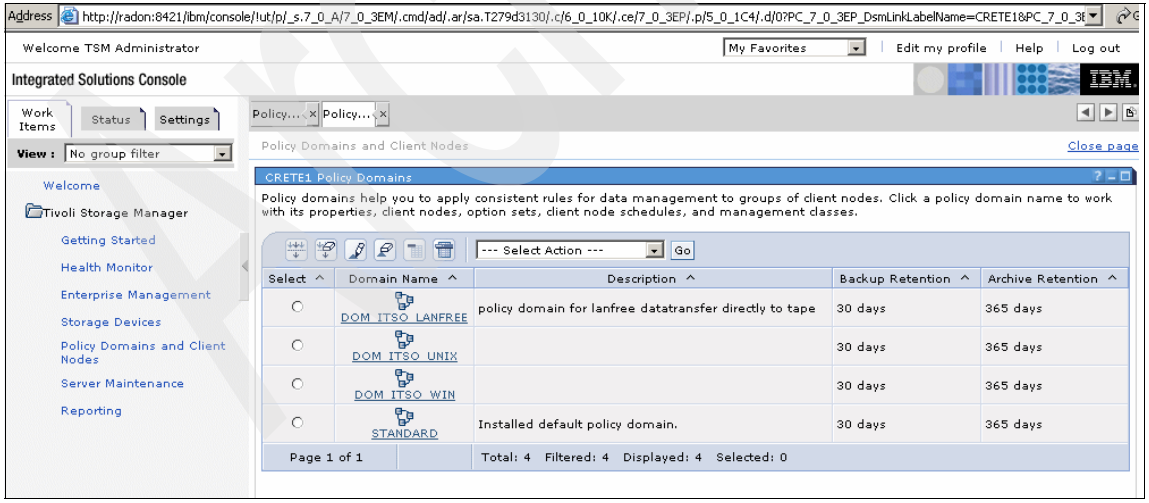


Figure 23-70 Choose appropriate policy domain

3. Select the client's policy domain by checking the radio button, as shown in Figure 23-70.

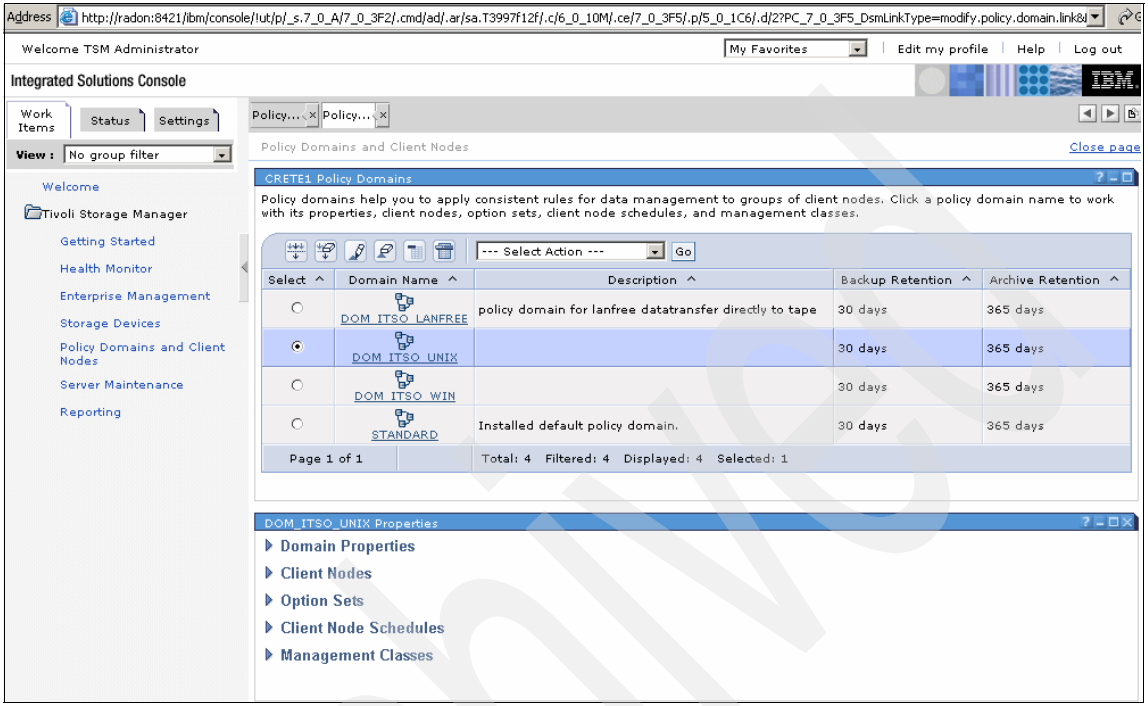


Figure 23-71 Expand Client Nodes

4. Expand the Client Nodes element of the Domain properties portlet at the bottom of the window, as shown in Figure 23-71.

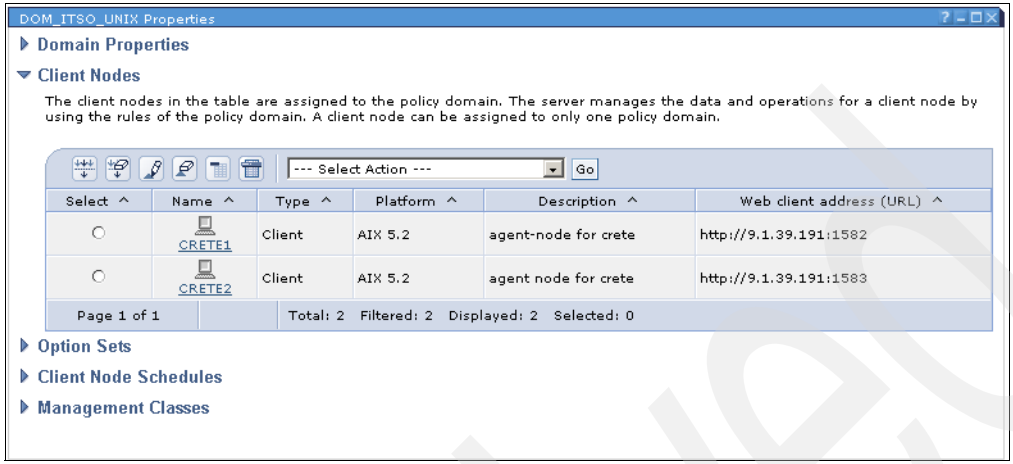


Figure 23-72 Select node

5. Once the node is displayed, select its radio button, as shown in Figure 23-72.

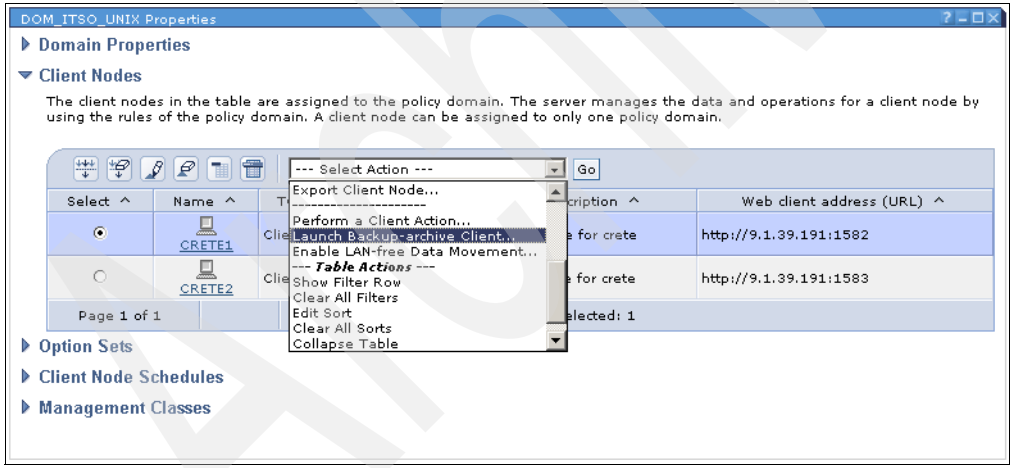


Figure 23-73 Open drop-down menu

6. Scroll down the drop-down menu, select **Launch Backup-archive Client...** as shown in Figure 23-73, and click **Go**.

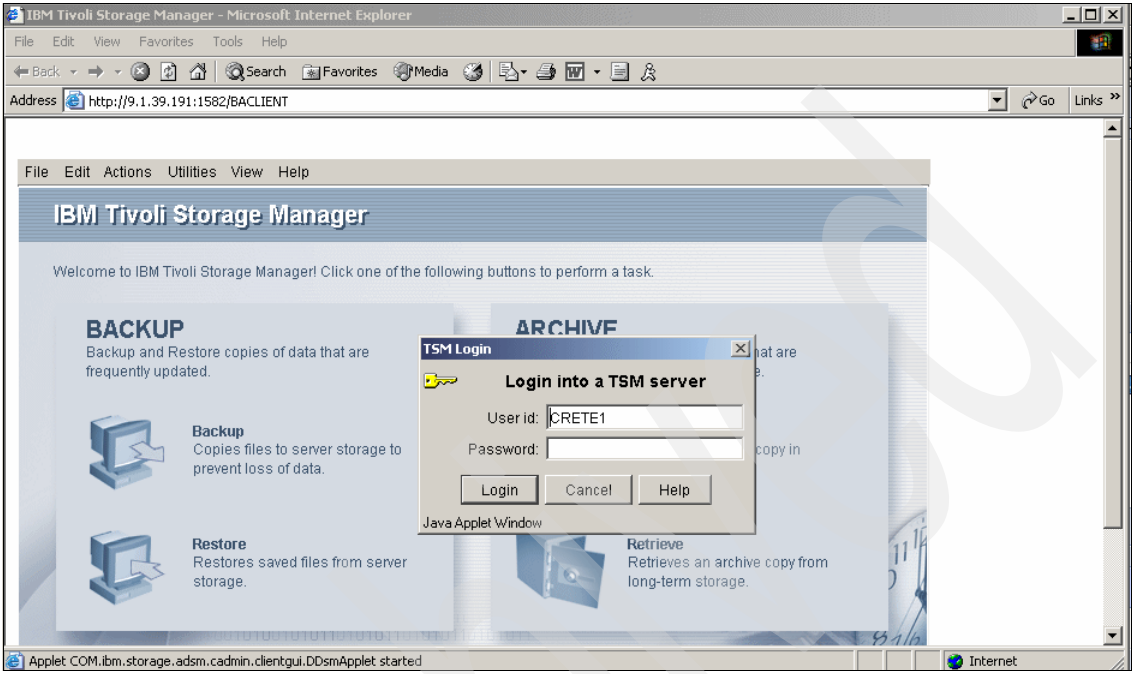


Figure 23-74 Prompt for client password

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.

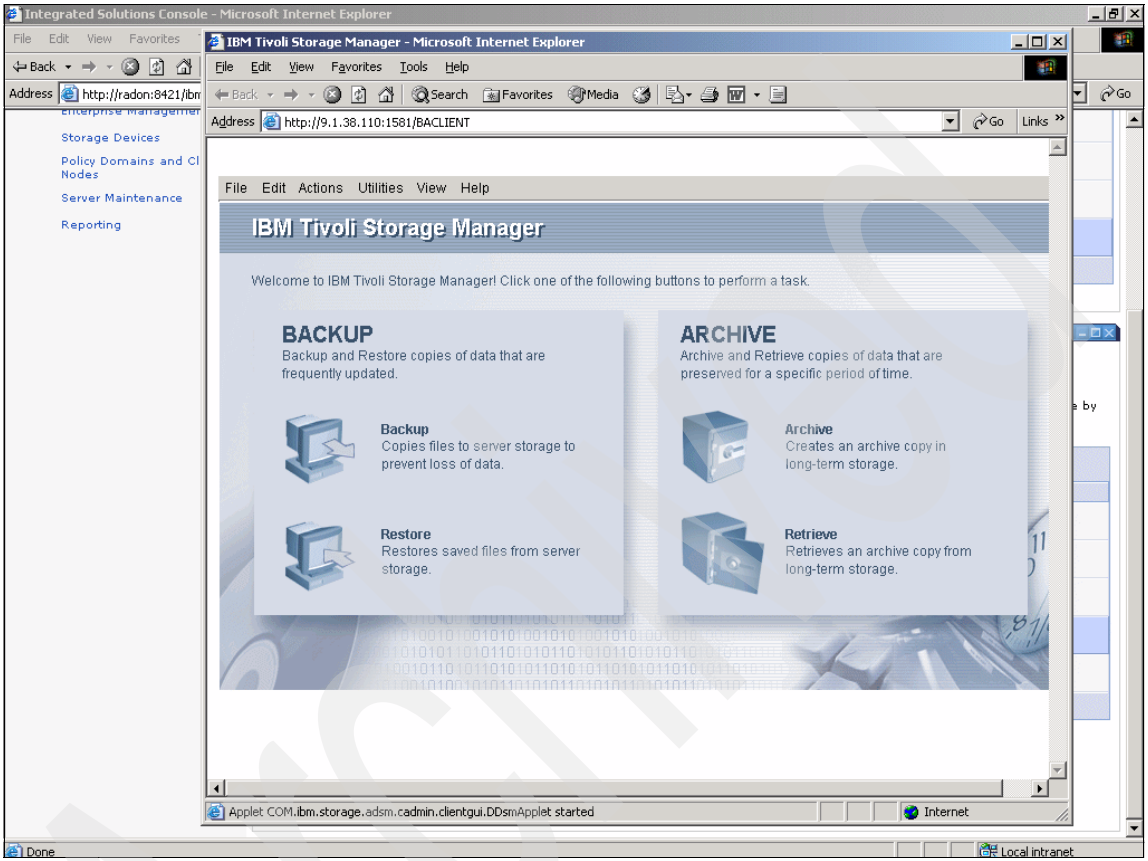


Figure 23-75 Web client launched from Administration Center

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.

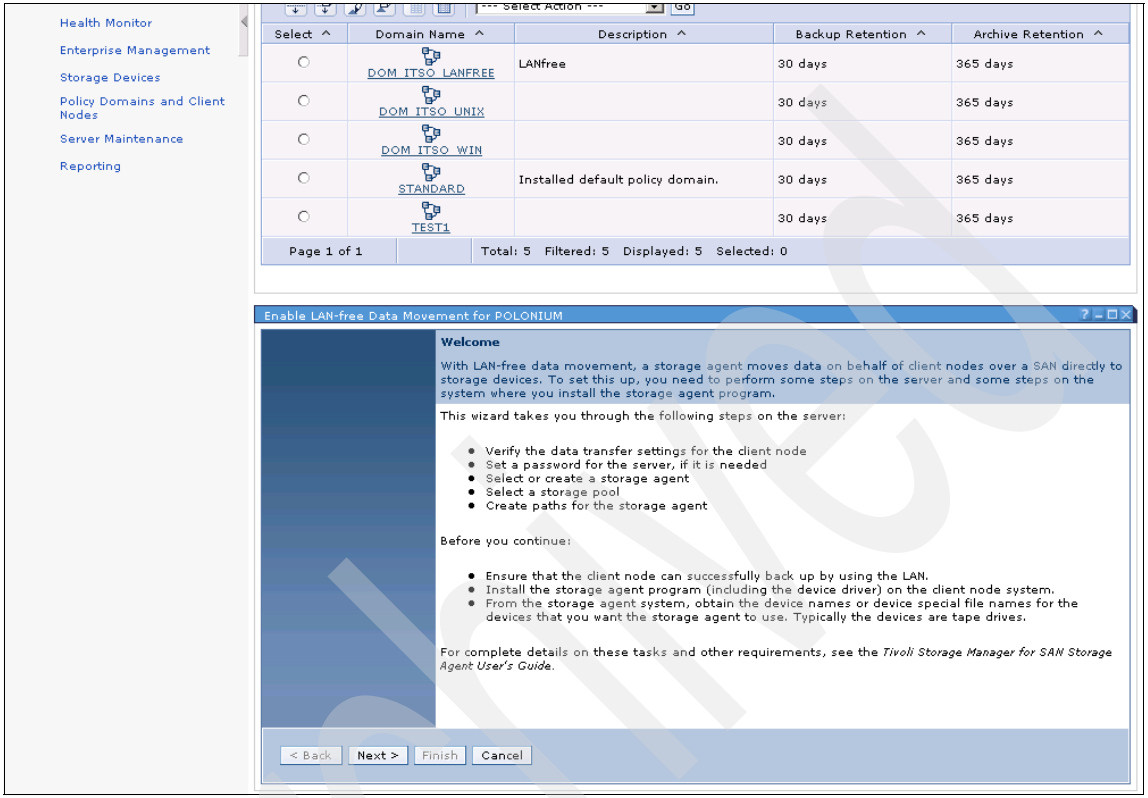


Figure 23-76 Enable LAN-free Data Movement wizard

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.

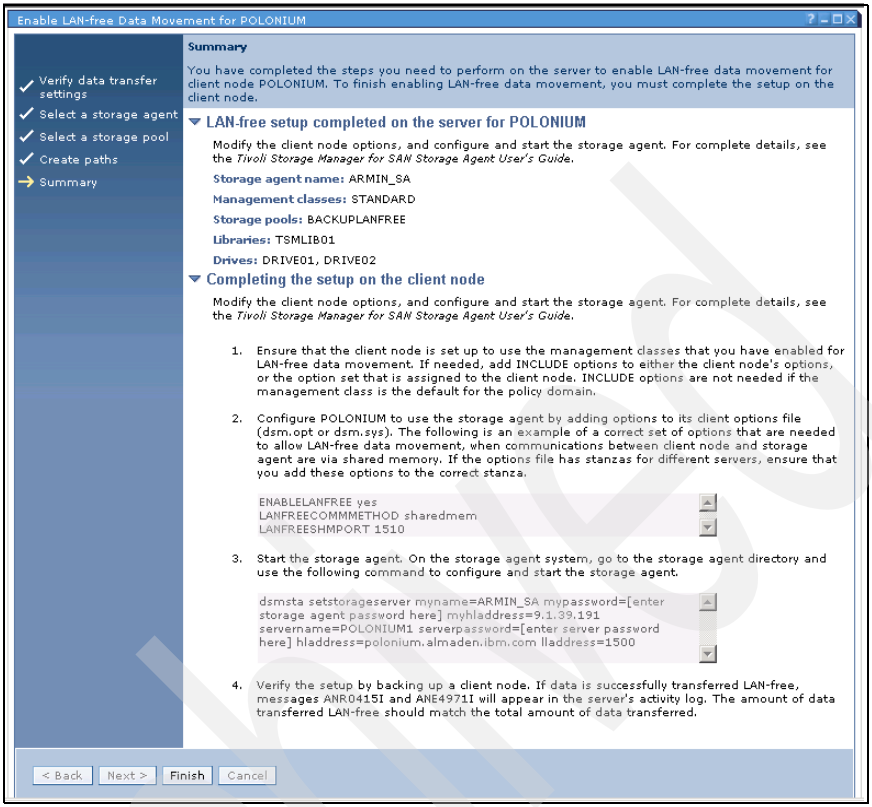


Figure 23-77 Wizard summary

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.

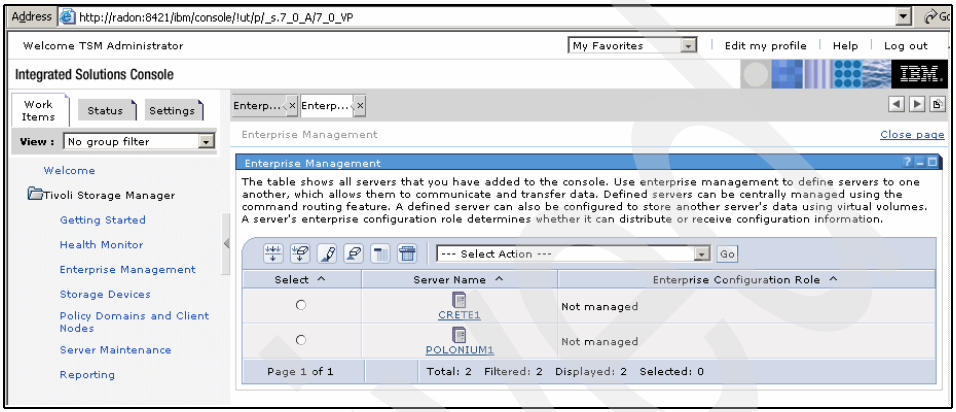


Figure 23-78 Setup the Enterprise Configuration

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**.

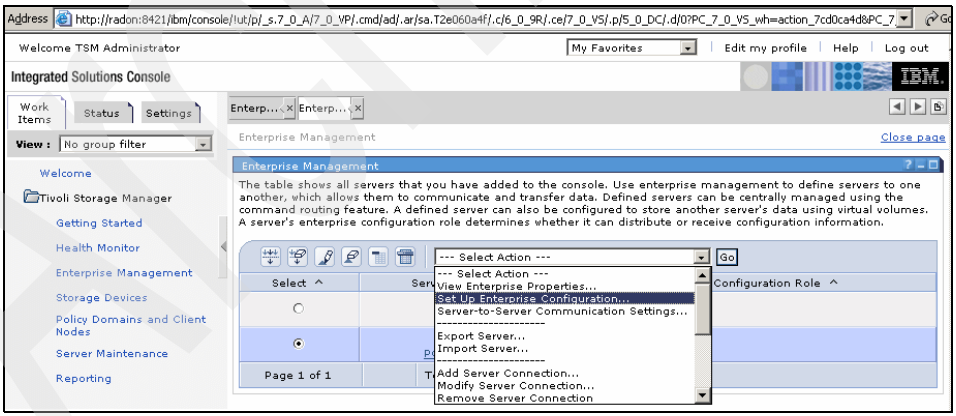


Figure 23-79 Select Set Up Enterprise Configuration...

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.

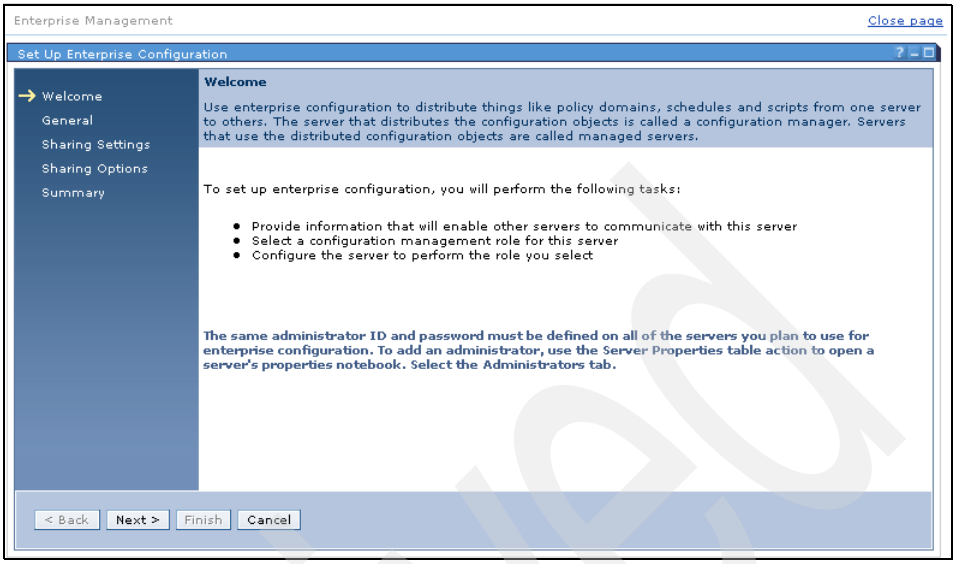


Figure 23-80 Enterprise Configuration Wizard

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.

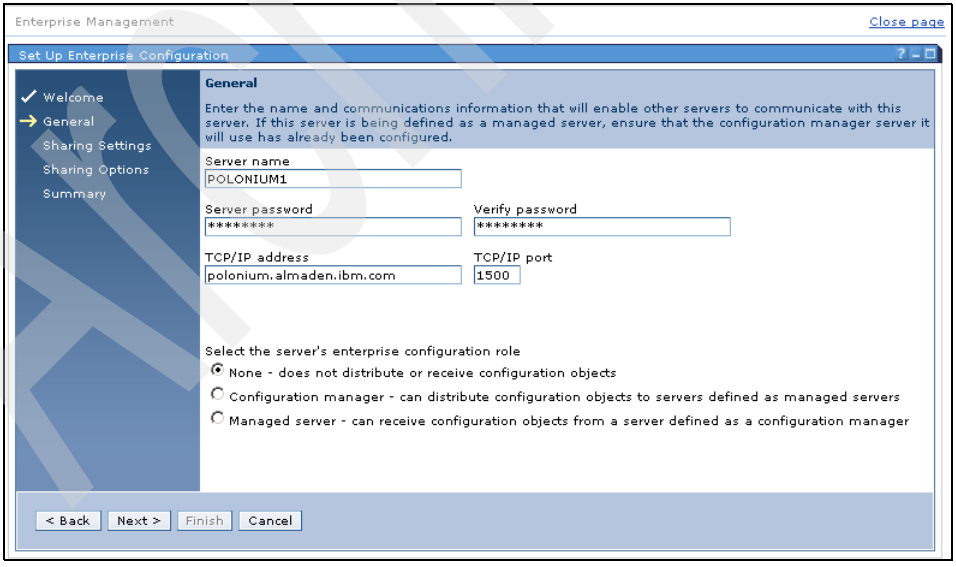


Figure 23-81 Enterprise Configuration Wizard - General

6. Check the summary and click **Next**. The Summary will be displayed, as shown in Figure 23-82.

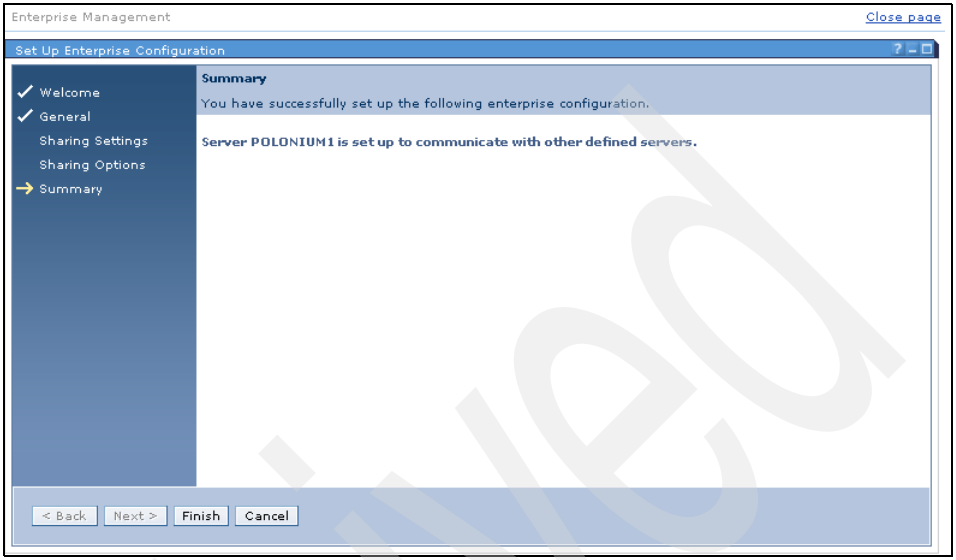


Figure 23-82 Enterprise Configuration Wizard - Summary

Having completed the wizard, there are a couple of checks required to complete this task.

7. 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.

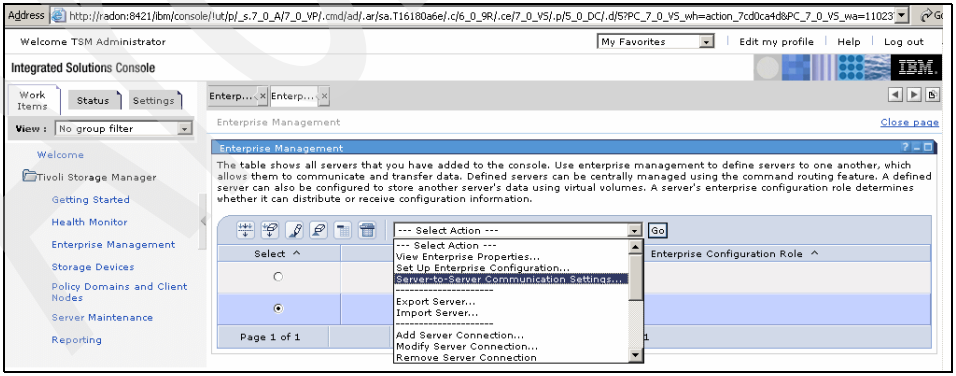


Figure 23-83 Enterprise Configuration - Server-to-Server Communication Settings

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.

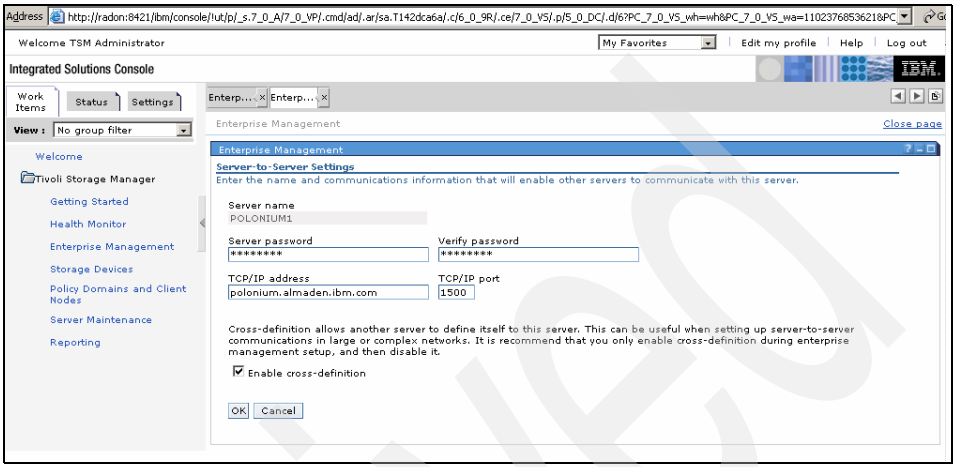


Figure 23-84 Enterprise Configuration - Enable Cross Definition

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.

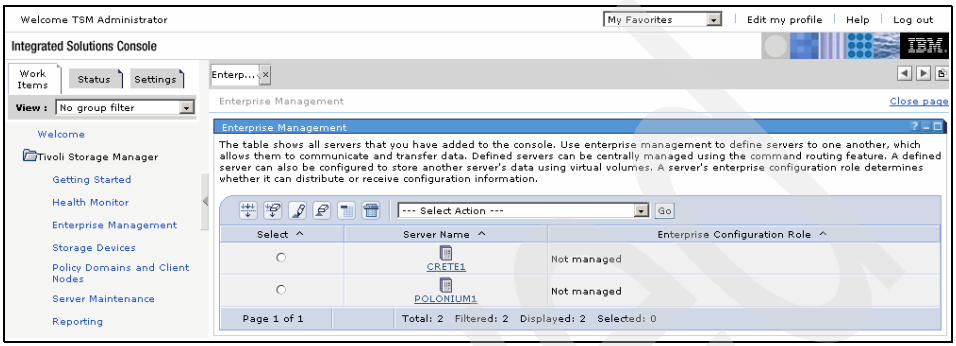


Figure 23-85 Setup the Enterprise Configuration

3. 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.

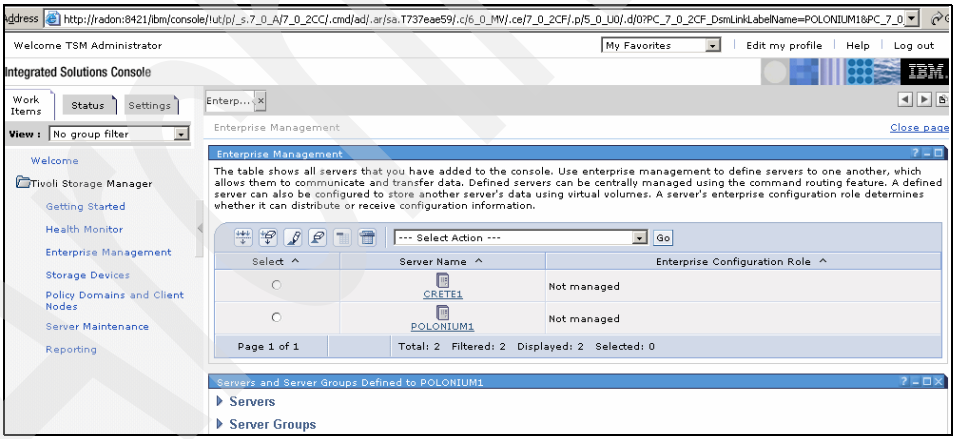


Figure 23-86 Select the server for Enterprise Configuration

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**.

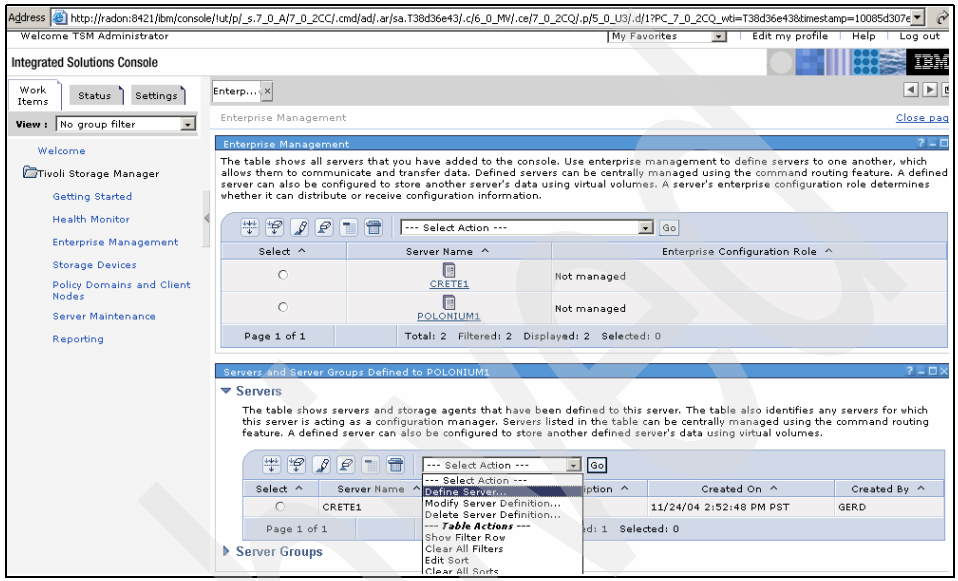


Figure 23-87 Show all defined servers and select Define Servers

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.

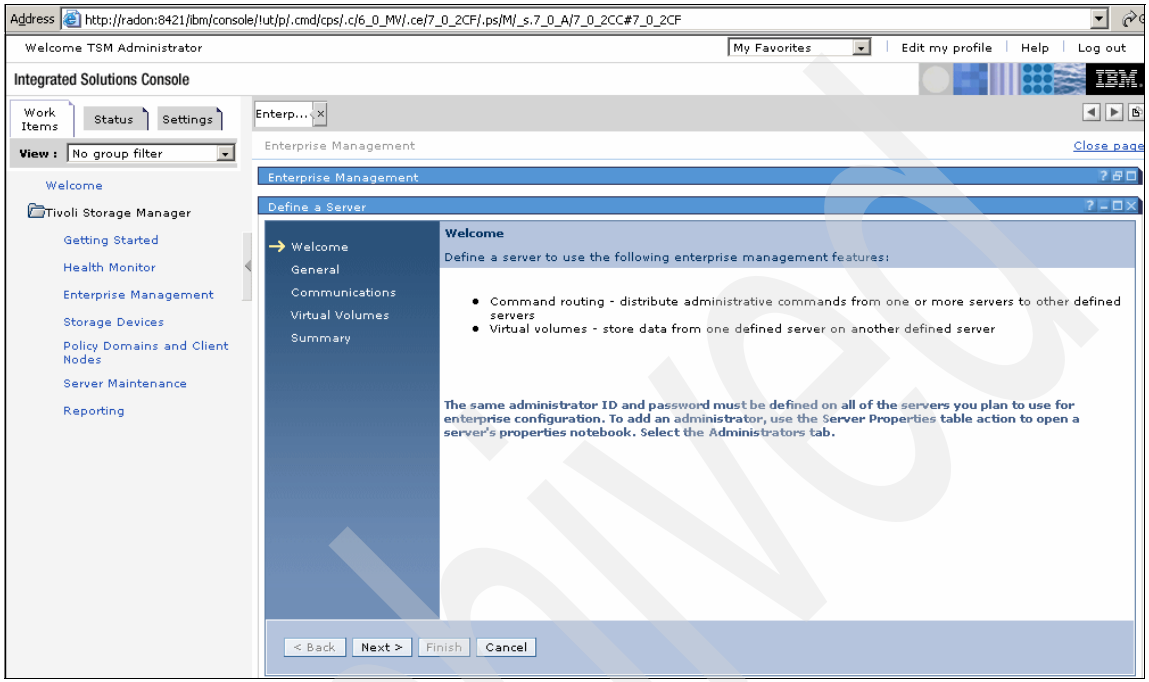


Figure 23-88 Define Server Wizard introduction

7. Click **Next** to start the Wizard and the page shown in Figure 23-89 will be displayed.

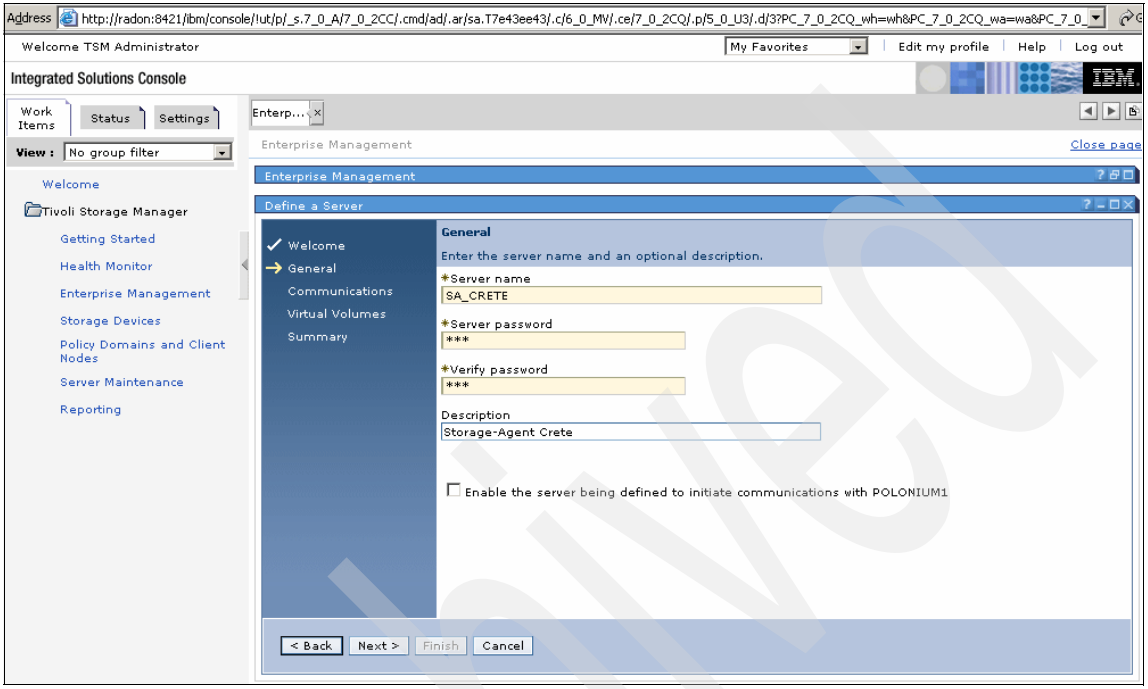


Figure 23-89 Define Server Wizard - General

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.

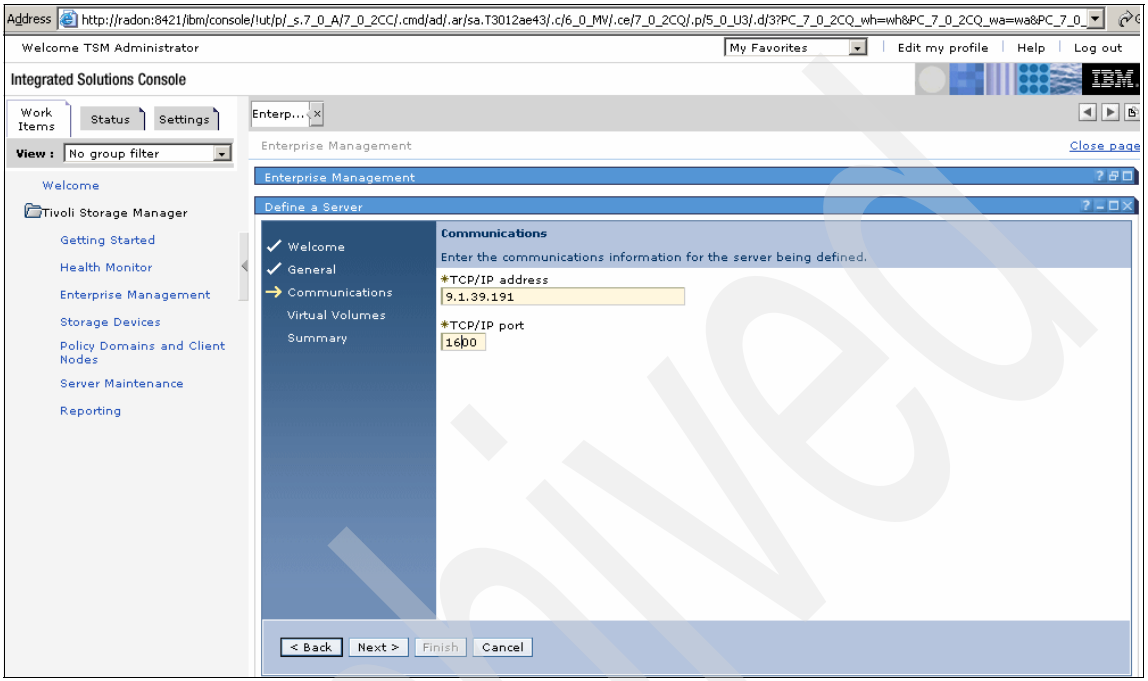


Figure 23-90 Define Server Wizard - Communications

9. 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.

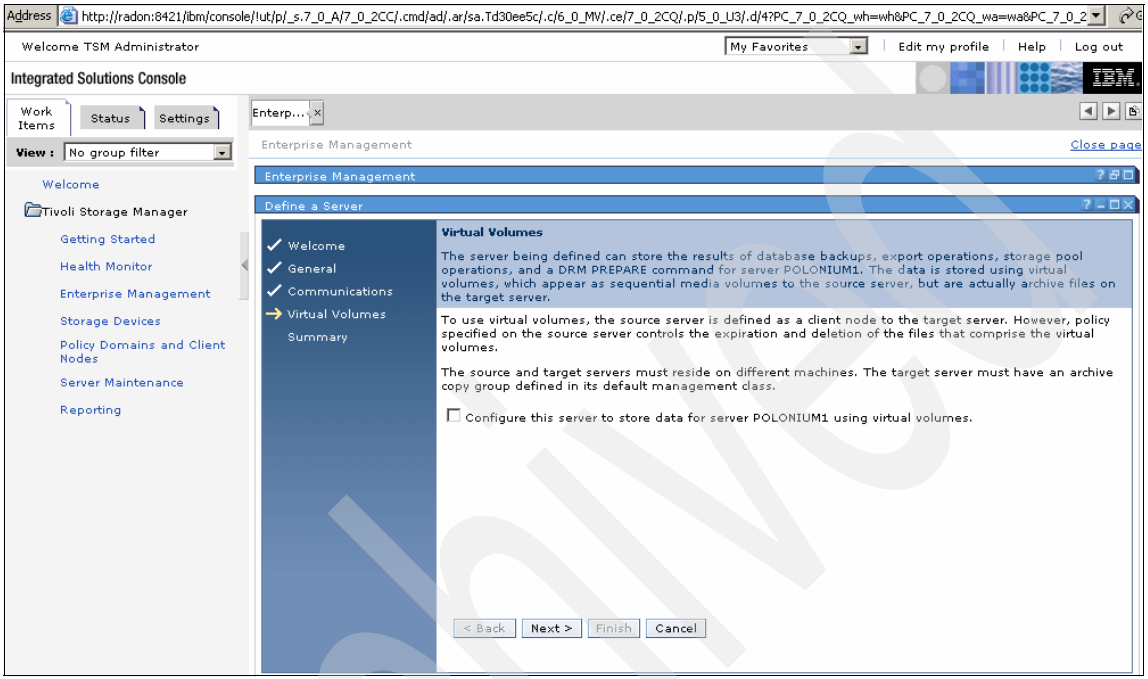


Figure 23-91 Define Server Wizard - Virtual Volumes

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.

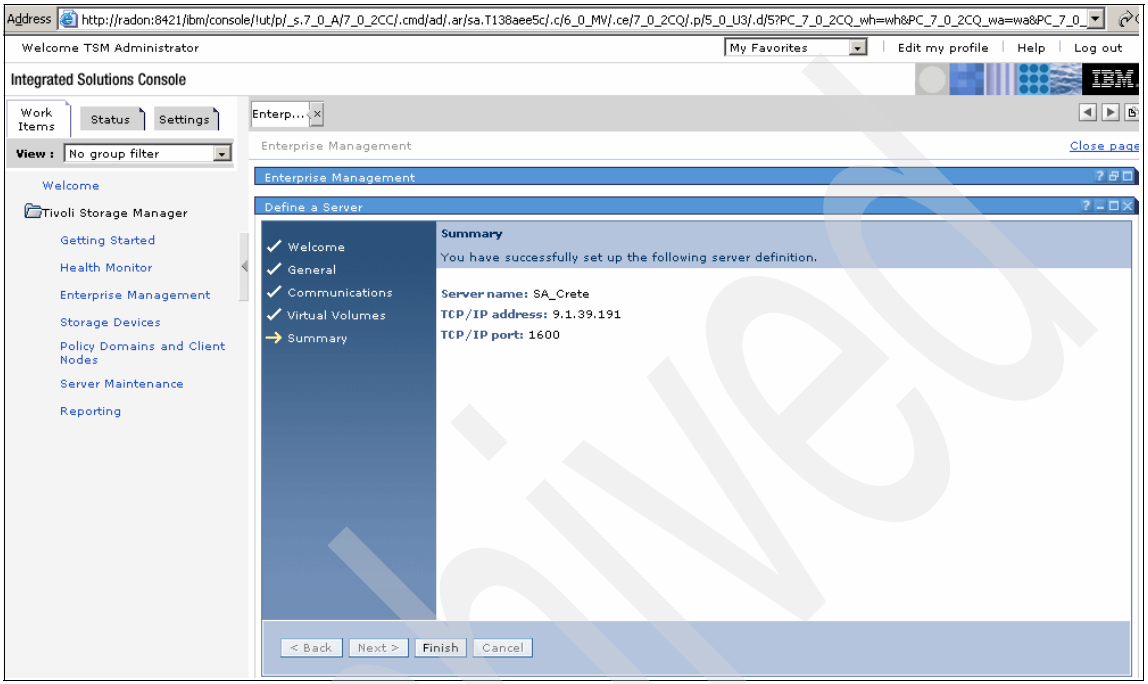


Figure 23-92 Define Server Wizard - Summary

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**.

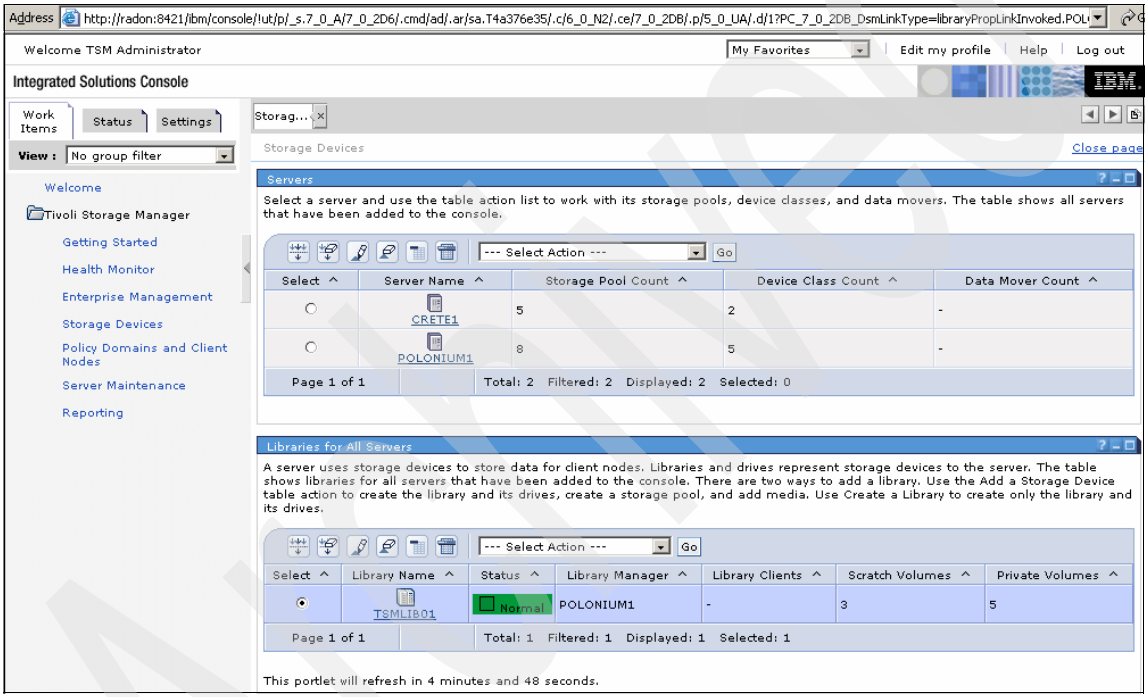


Figure 23-93 Modify Library drop-down selected

4. In the Library properties portlet, click the **Drive Paths** tab to open the portlet, as shown in Figure 23-94.

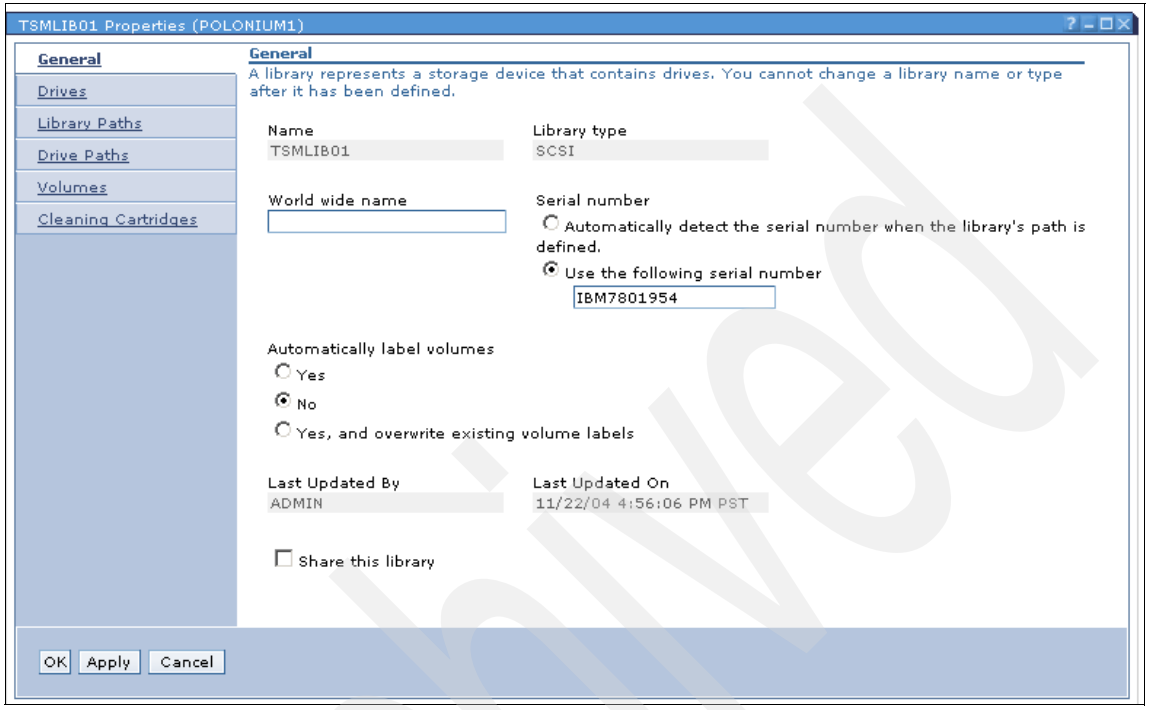


Figure 23-94 Library properties portlet

Choose **Add Path ...** from the drop-down menu illustrated in Figure 23-95 and click **Go**.

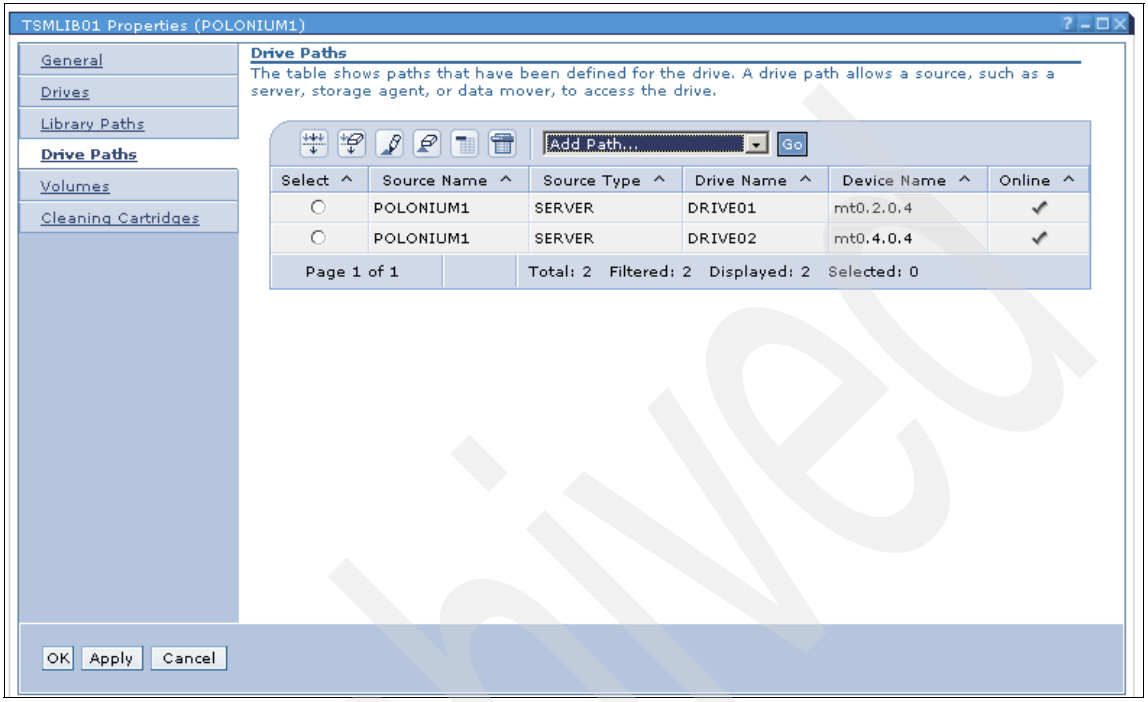


Figure 23-95 Add path drop-down menu

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.

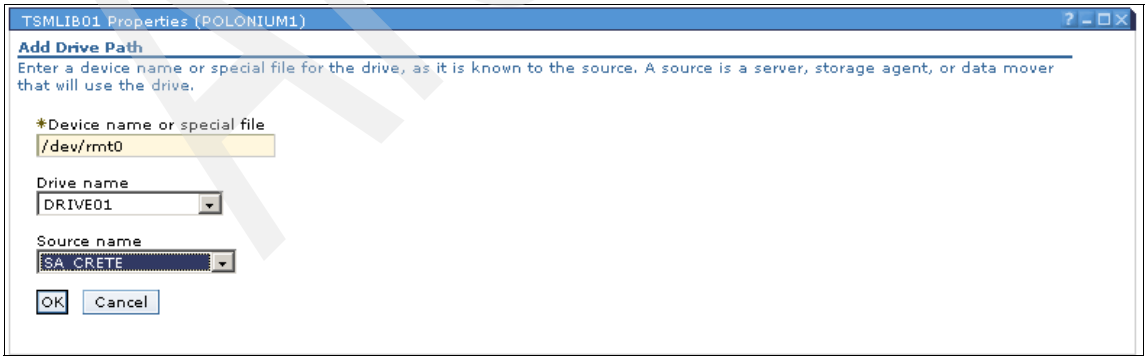


Figure 23-96 Enter path details

6. Check your input; the path must be online. Note the check indicating this in the **Online** column shown in Figure 23-97.

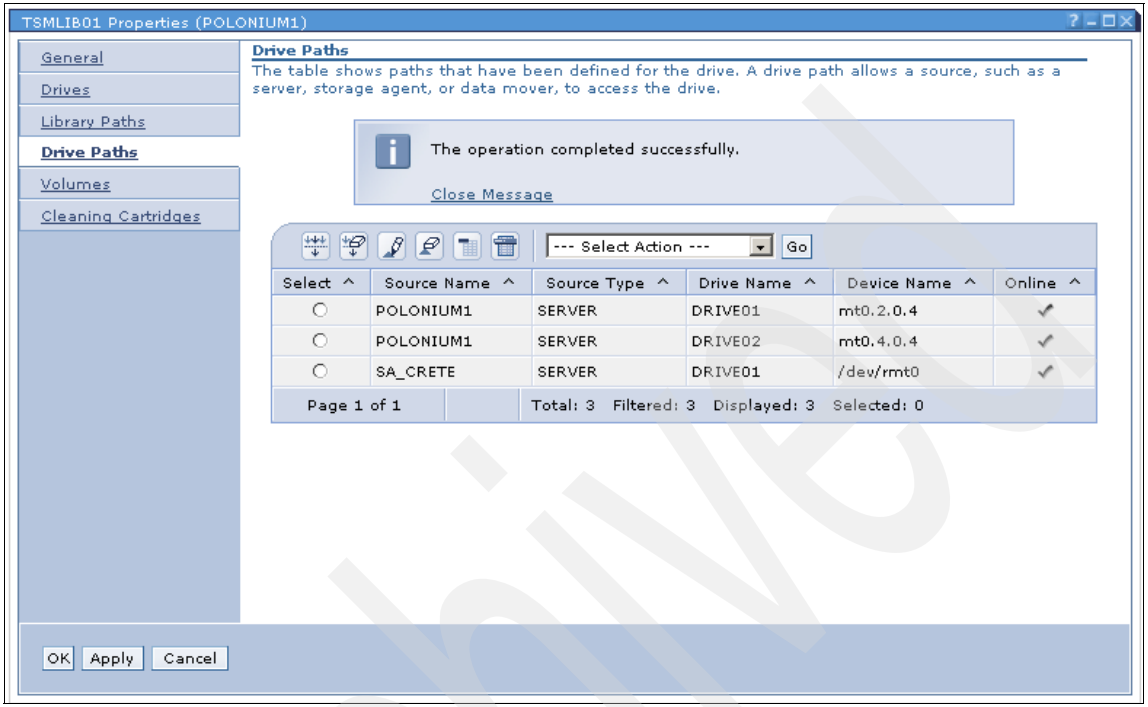


Figure 23-97 Path successfully added

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**.

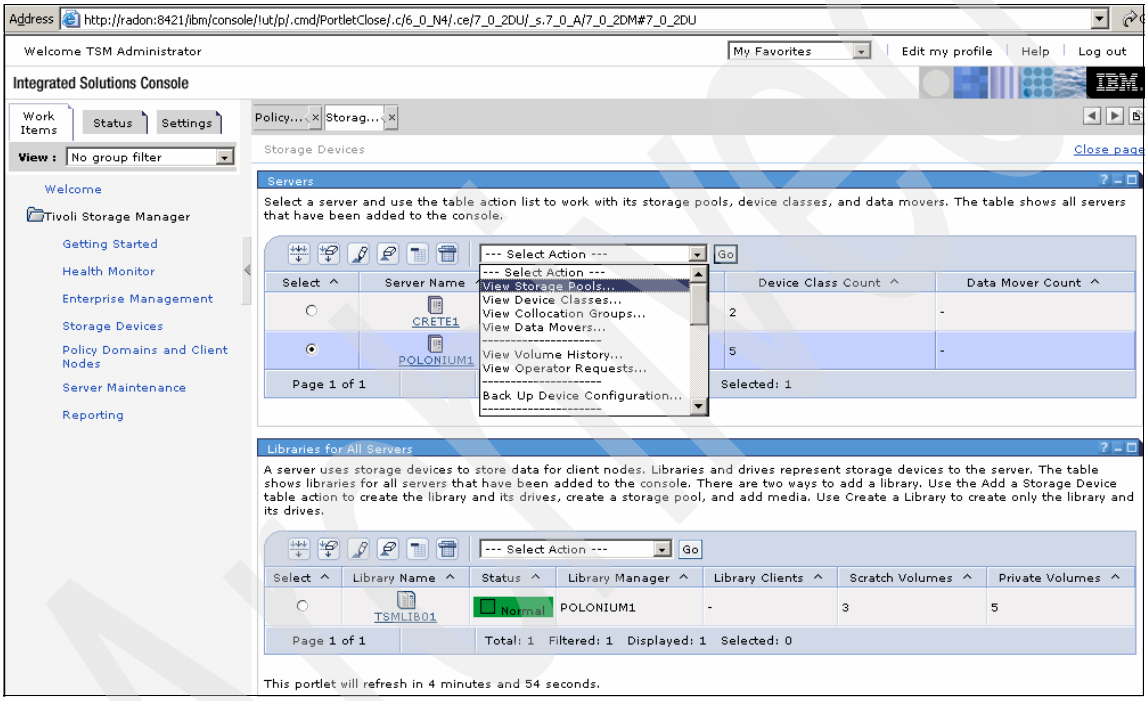


Figure 23-98 View Storage Pools drop-down

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**.

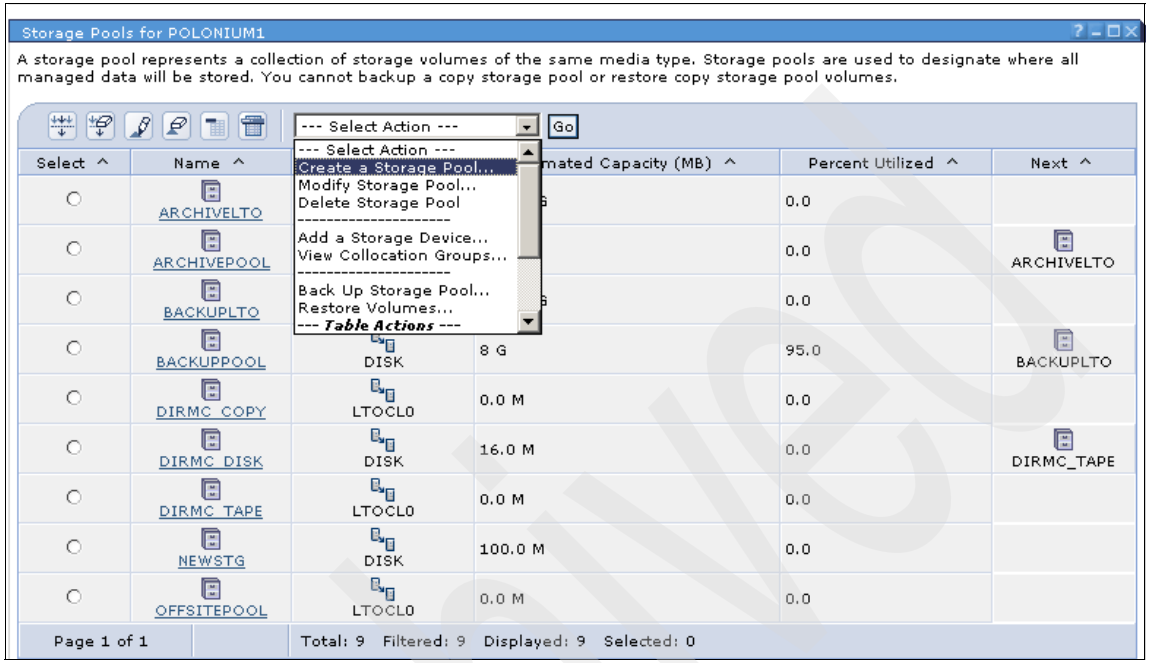


Figure 23-99 Create a Storage Pool drop-down

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.

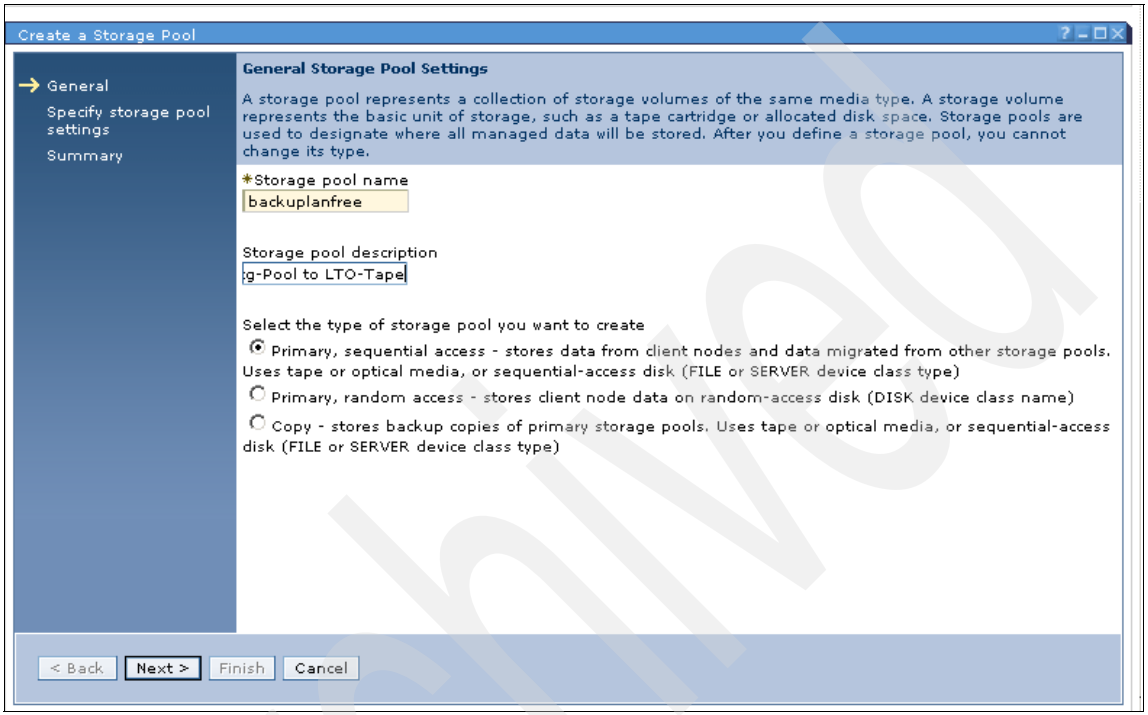


Figure 23-100 Choose Storage pool name and type

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.

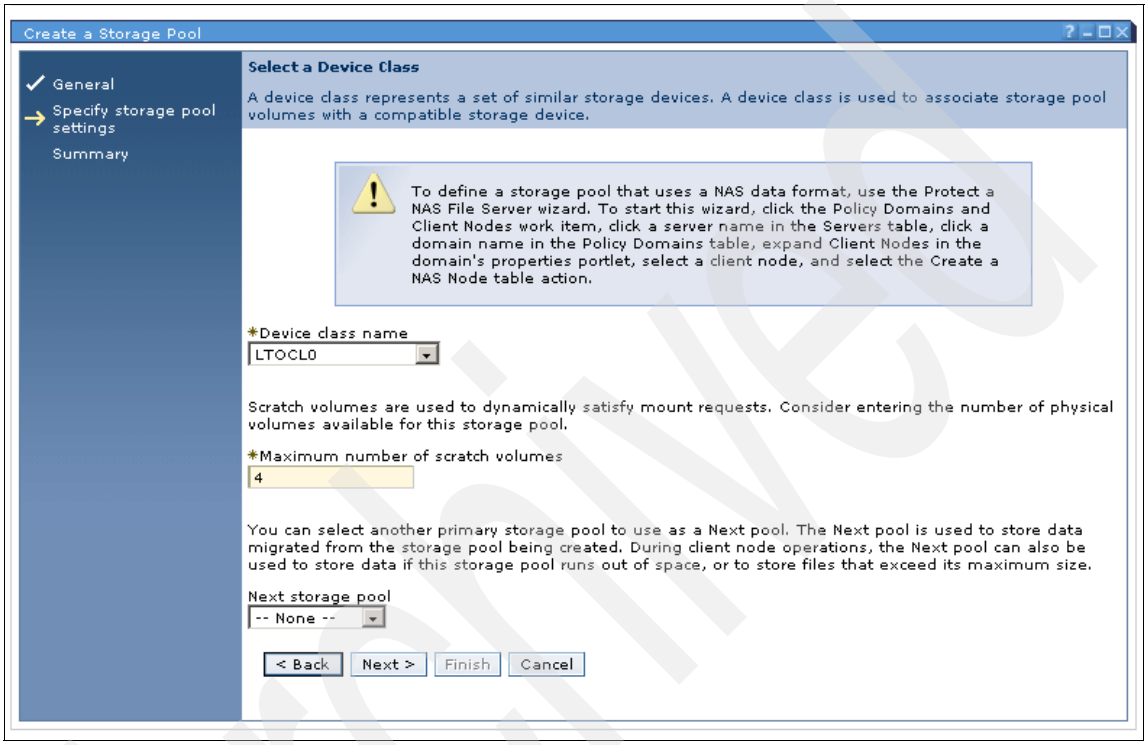


Figure 23-101 Select a Device Class

7. Click **Next** to display the summary page of the Create a Storage Pool wizard, as shown in Figure 23-102.

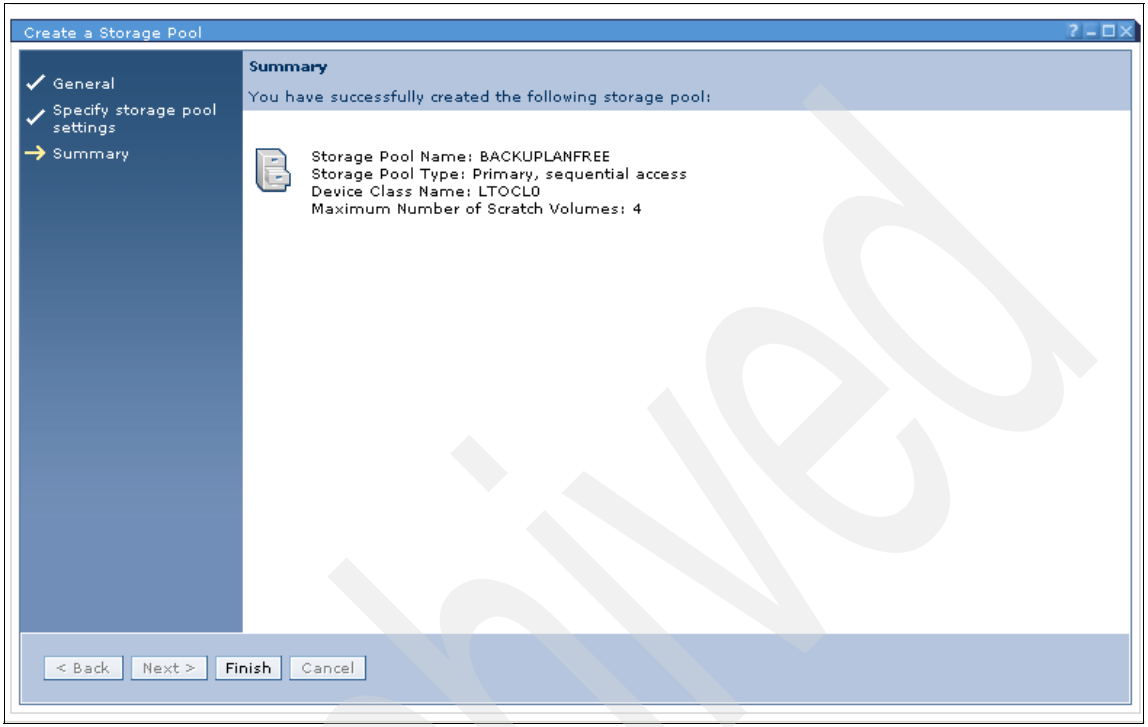


Figure 23-102 Successful completion of wizard

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.

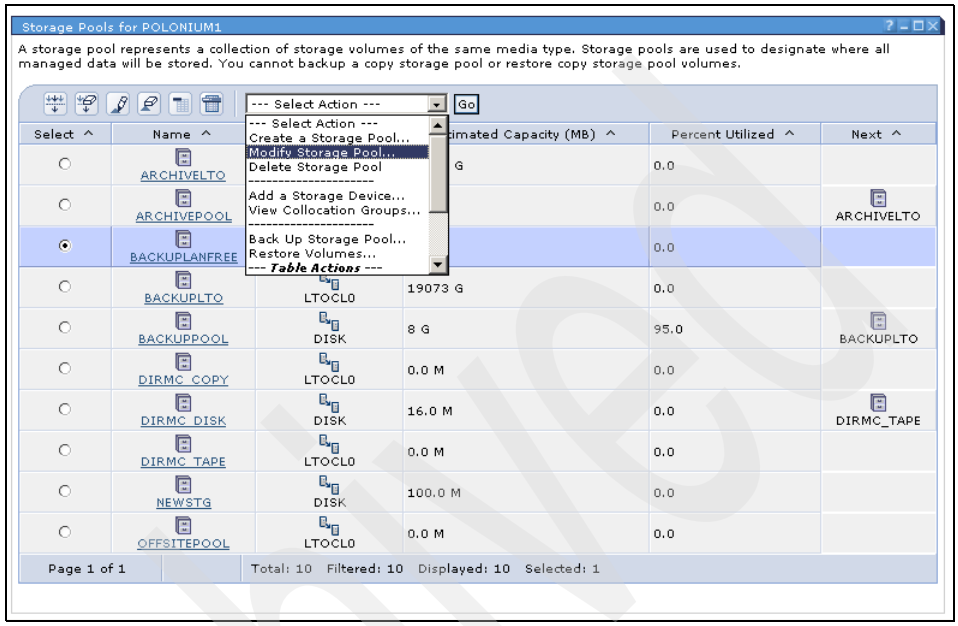


Figure 23-103 Modify Storage Pool

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.

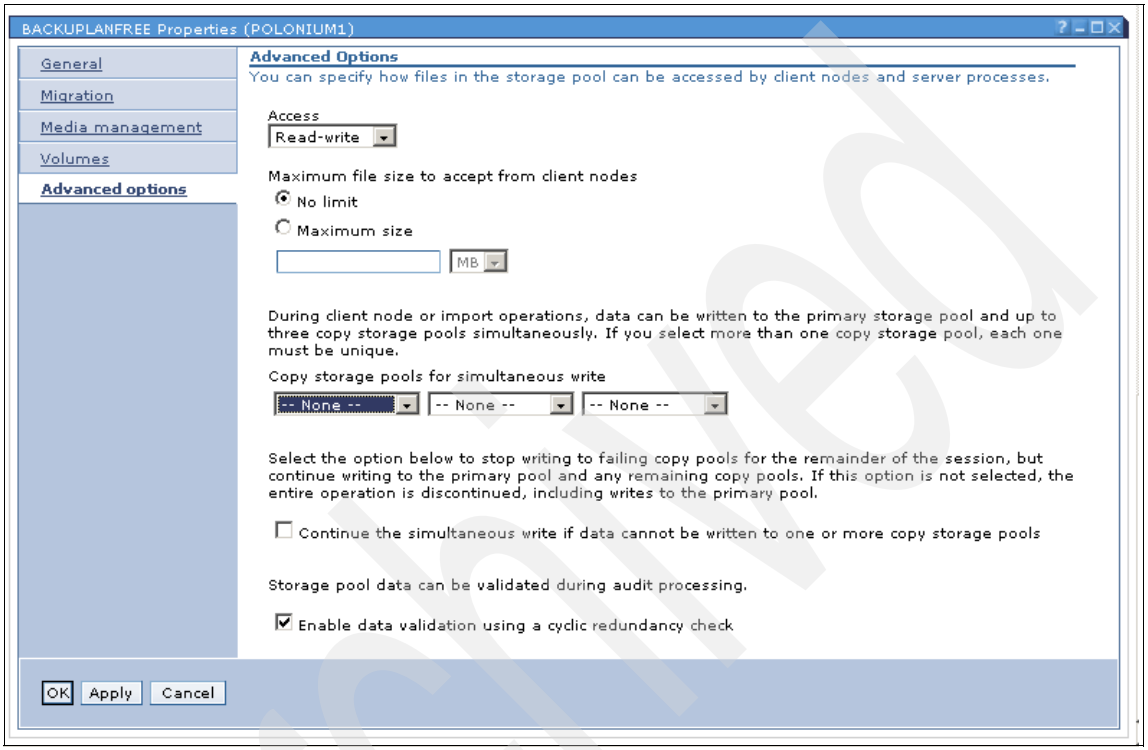


Figure 23-104 Enable CRC checking for Storage Pool

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**.

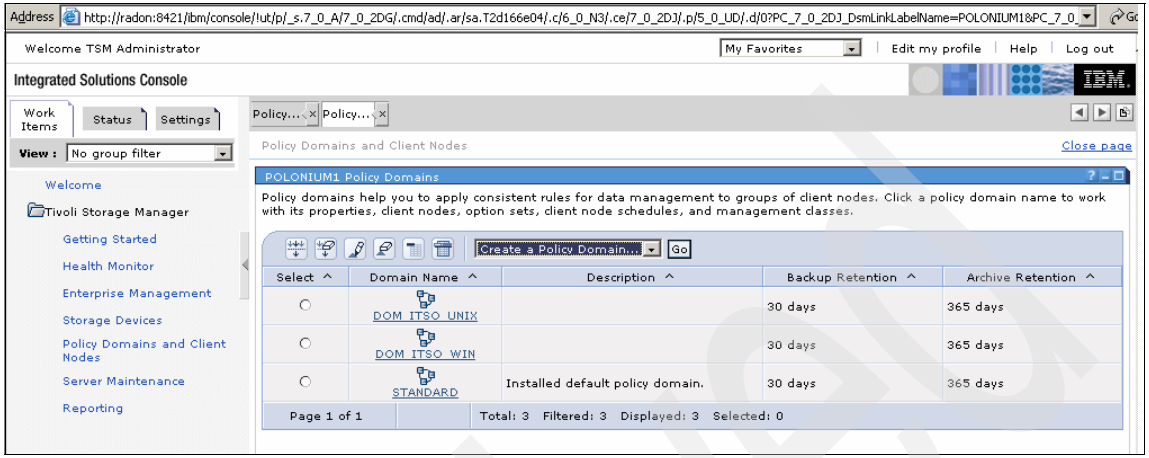


Figure 23-105 Define Policy Domain

4. The wizard should now be displayed. The first page of the wizard is shown in Figure 23-106.

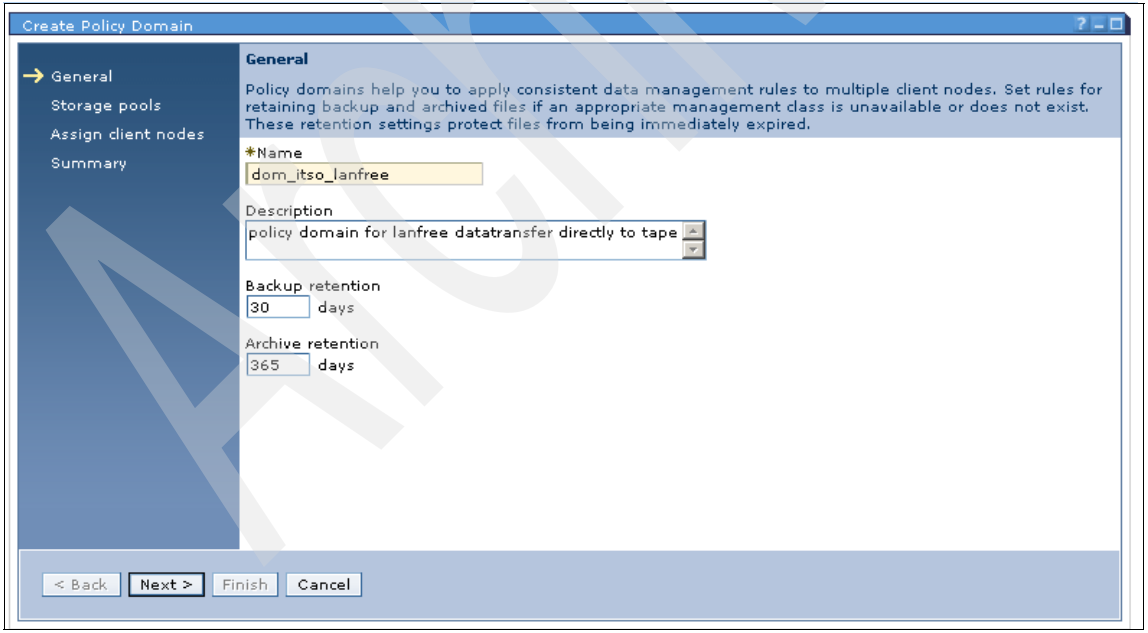


Figure 23-106 Define Policy Domain Wizard

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.
6. 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.

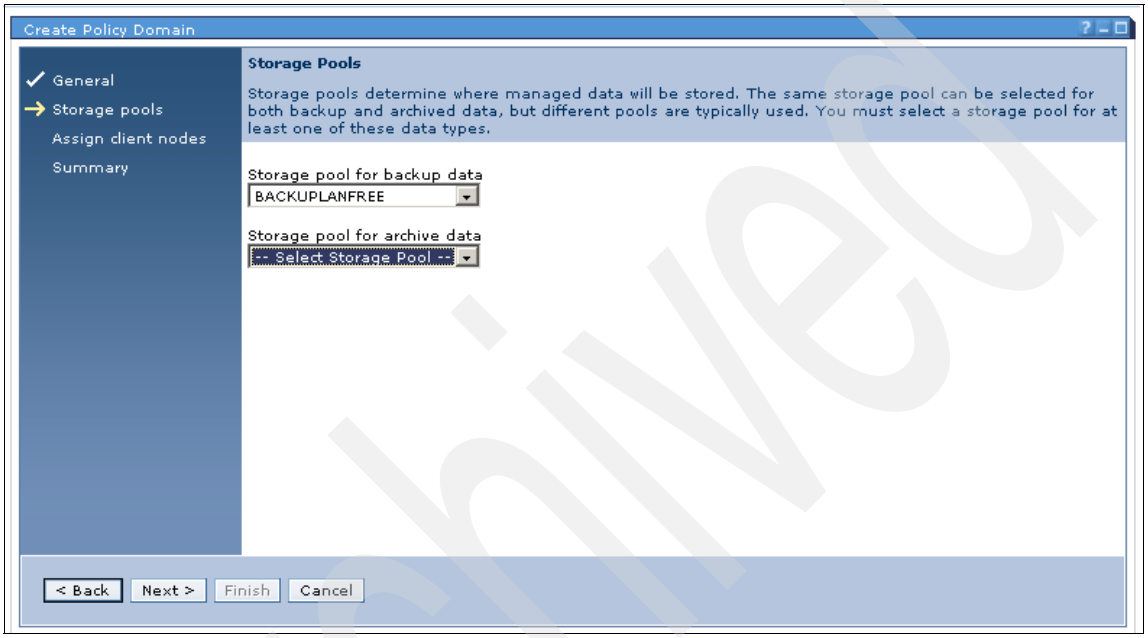


Figure 23-107 Define Policy Domain Wizard - Storage pools

7. Select the **Yes** radio button to assign clients to the policy domain immediately, as shown in Figure 23-108.

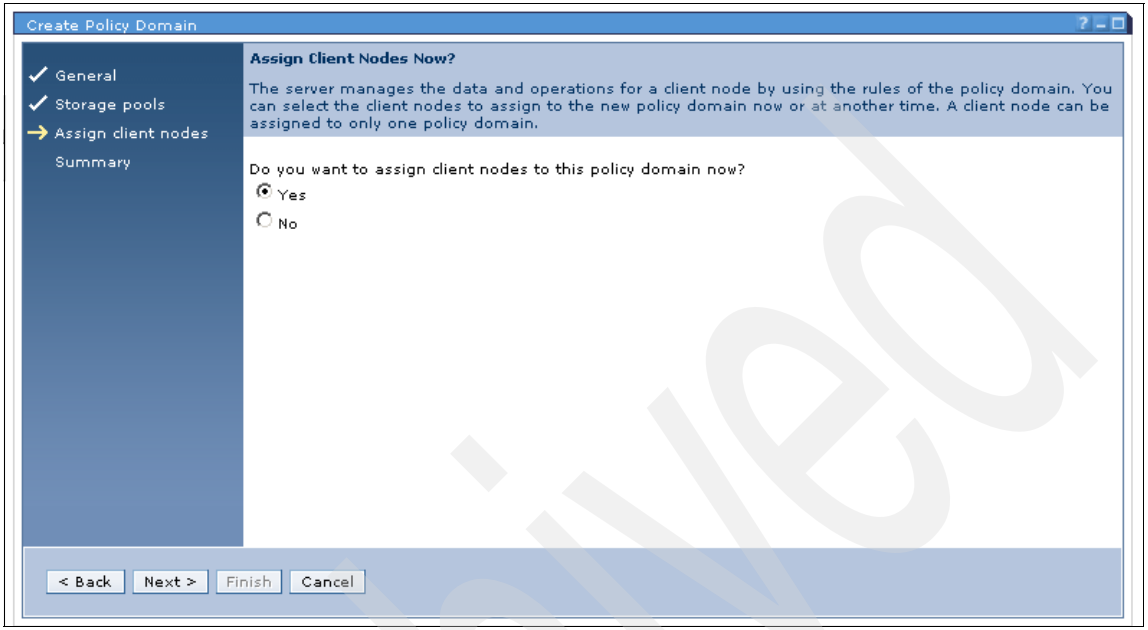


Figure 23-108 Define Policy Domain Wizard - Assign client nodes

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.

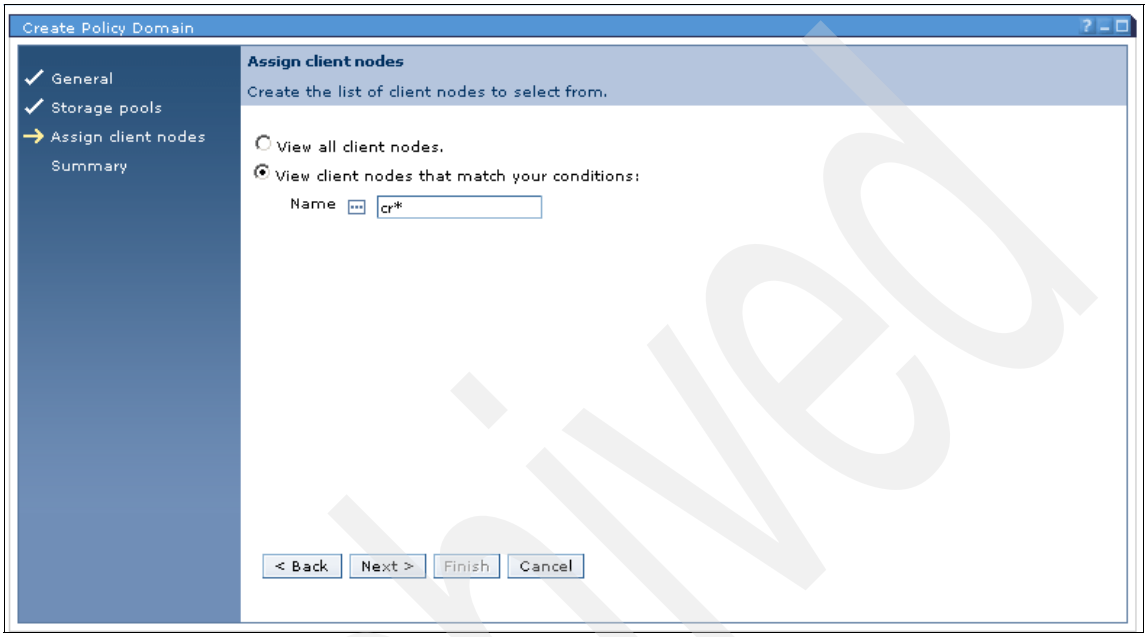


Figure 23-109 Define Policy Domain Wizard - View client nodes

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**.

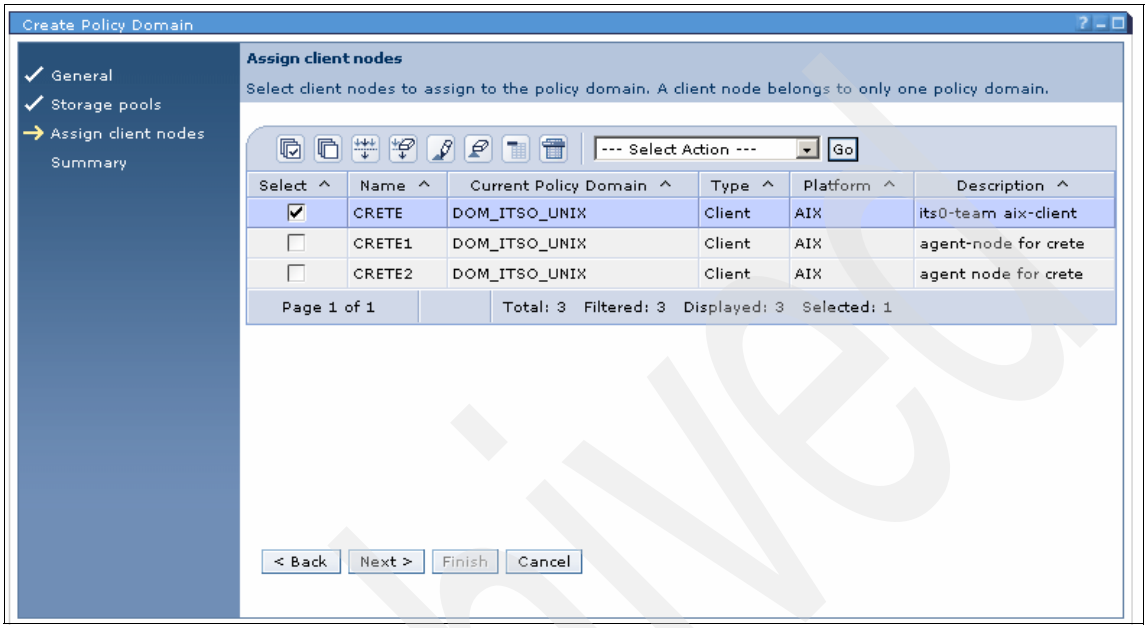


Figure 23-110 Define Policy Domain Wizard - Select client nodes

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.

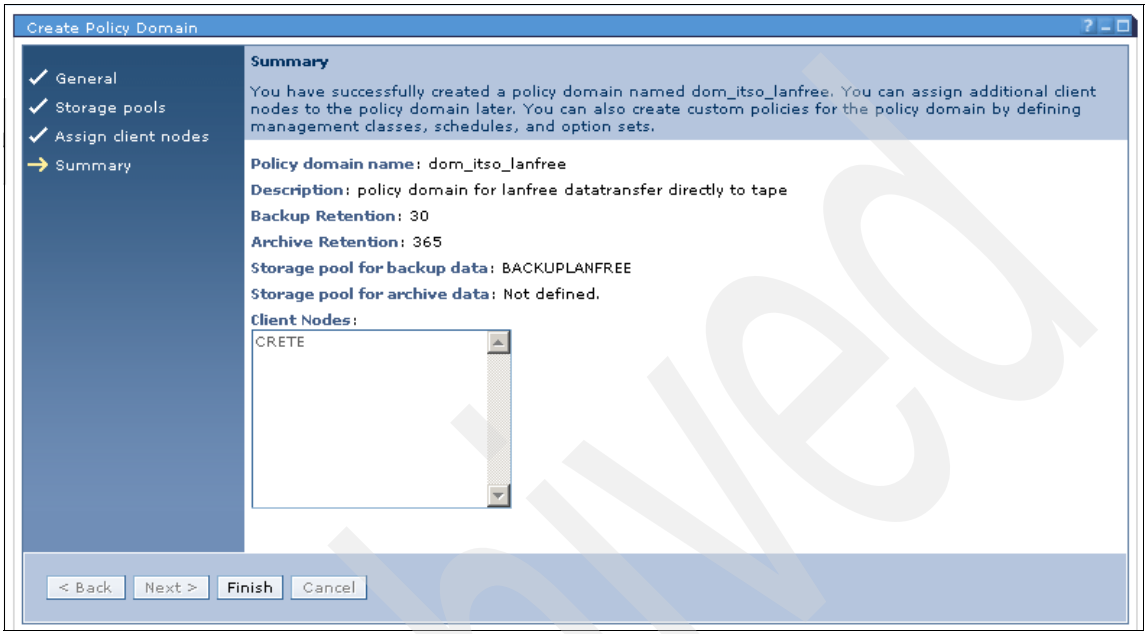


Figure 23-111 Define Policy Domain Wizard - Summary

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.

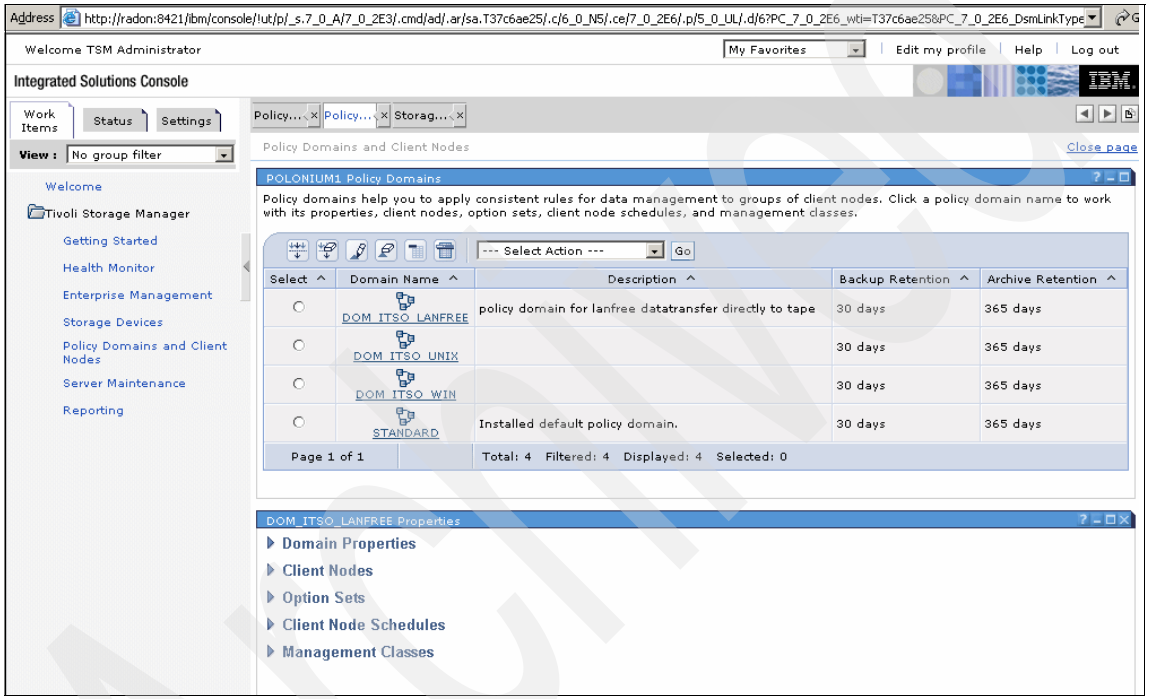


Figure 23-112 Policy Domains Properties - Define a new Management Class

3. Choose **Create Management Class...** from the drop-down menu and click **Go**, as shown in Figure 23-113.

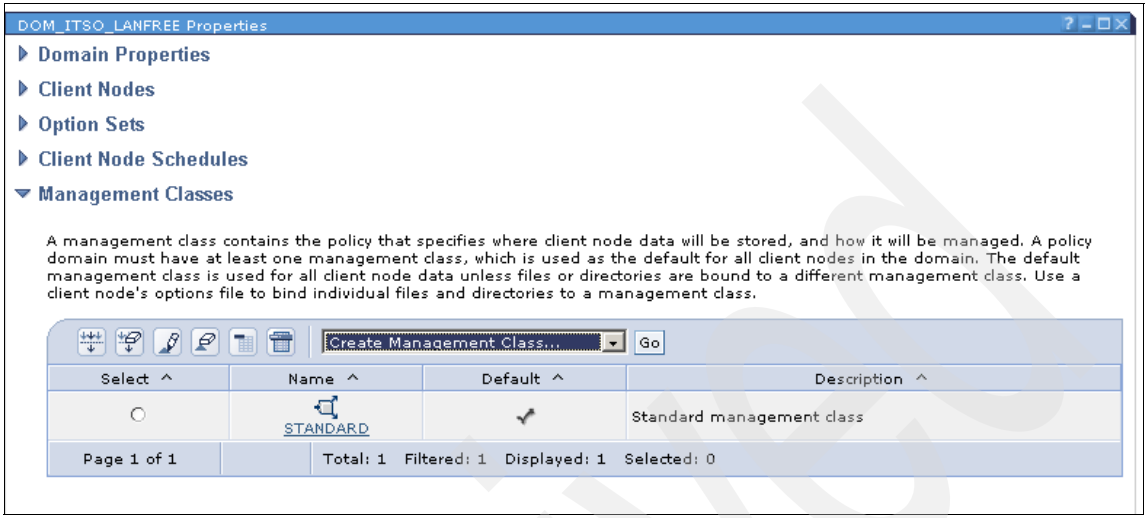


Figure 23-113 Create a Management Class drop-down

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.

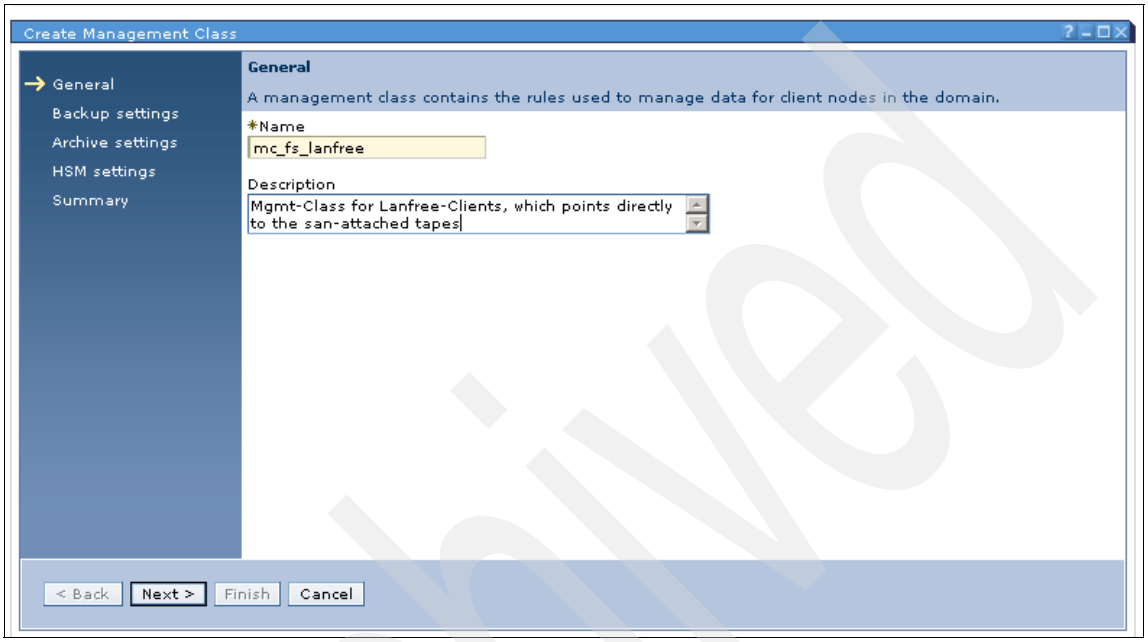


Figure 23-114 Create Management Class Wizard

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.

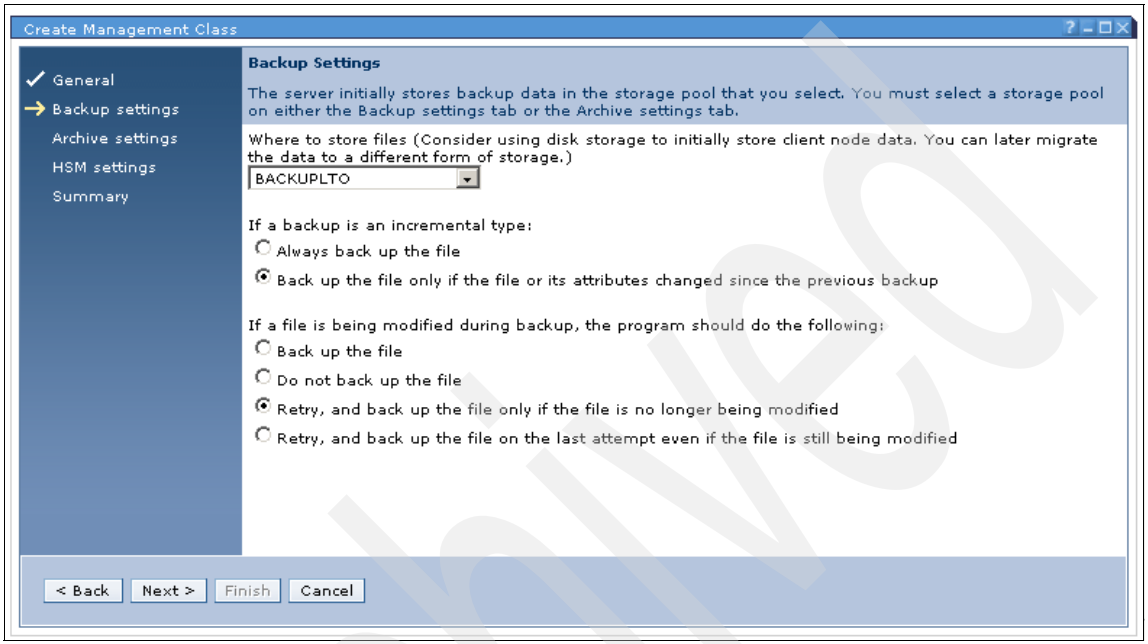


Figure 23-115 Create Management Class Wizard - Backup settings

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.

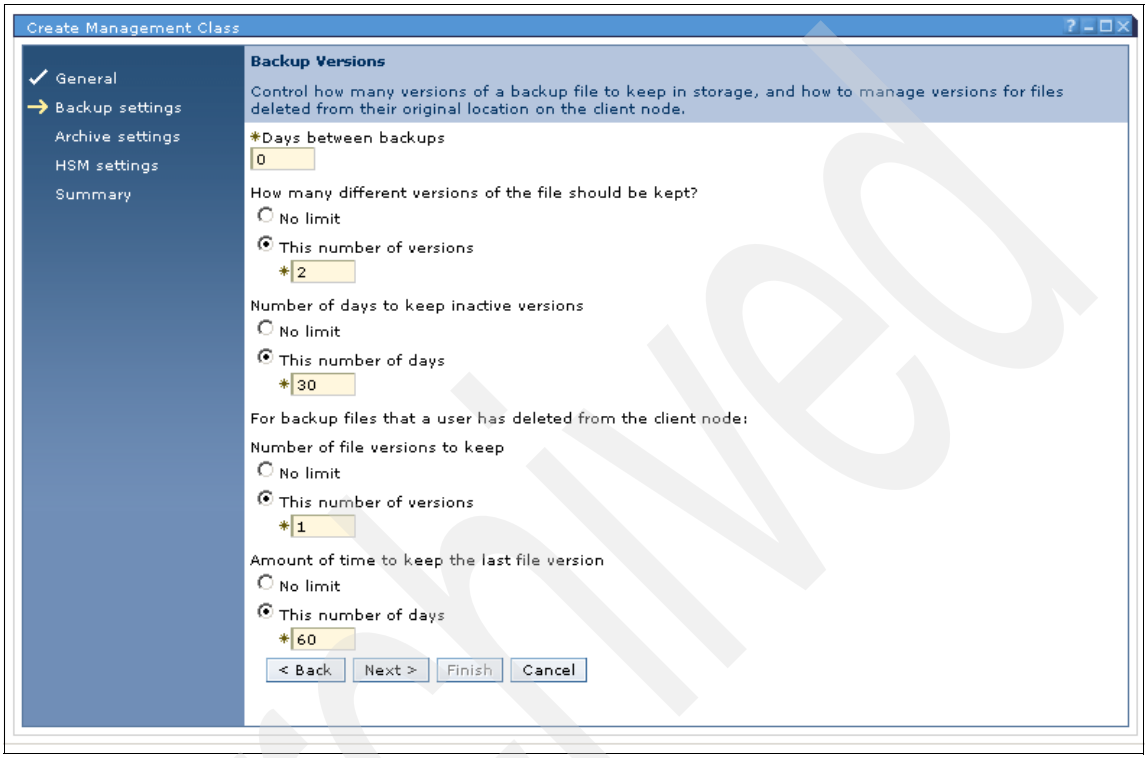


Figure 23-116 Create Management Class Wizard - Backup versions

7. 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.

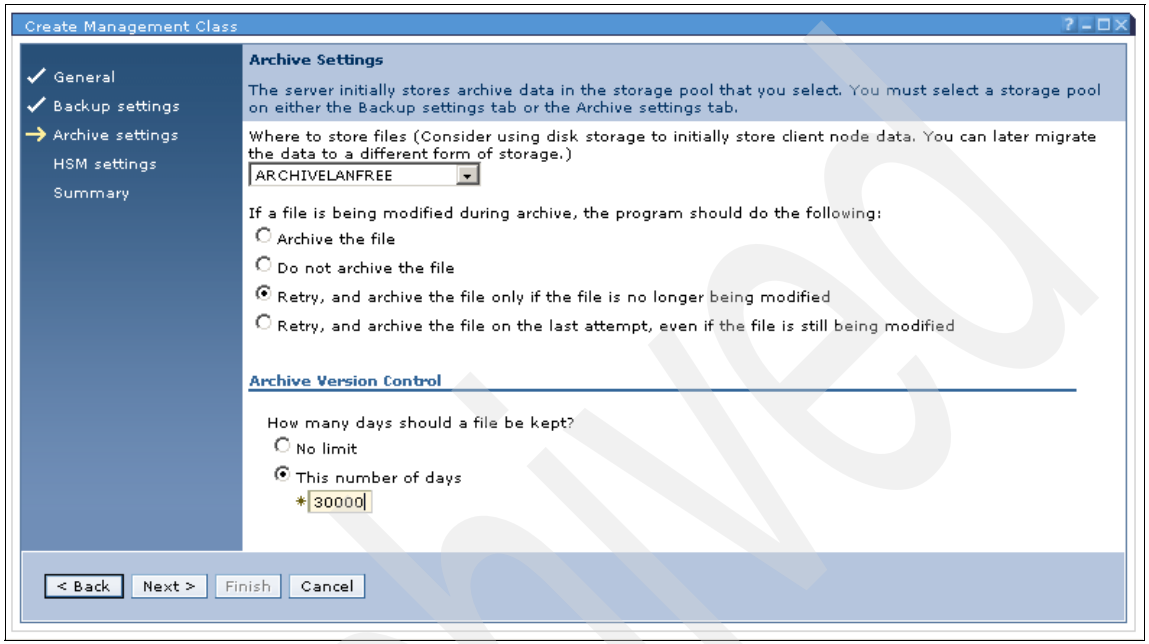


Figure 23-117 Create Management Class Wizard - Archive settings

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.

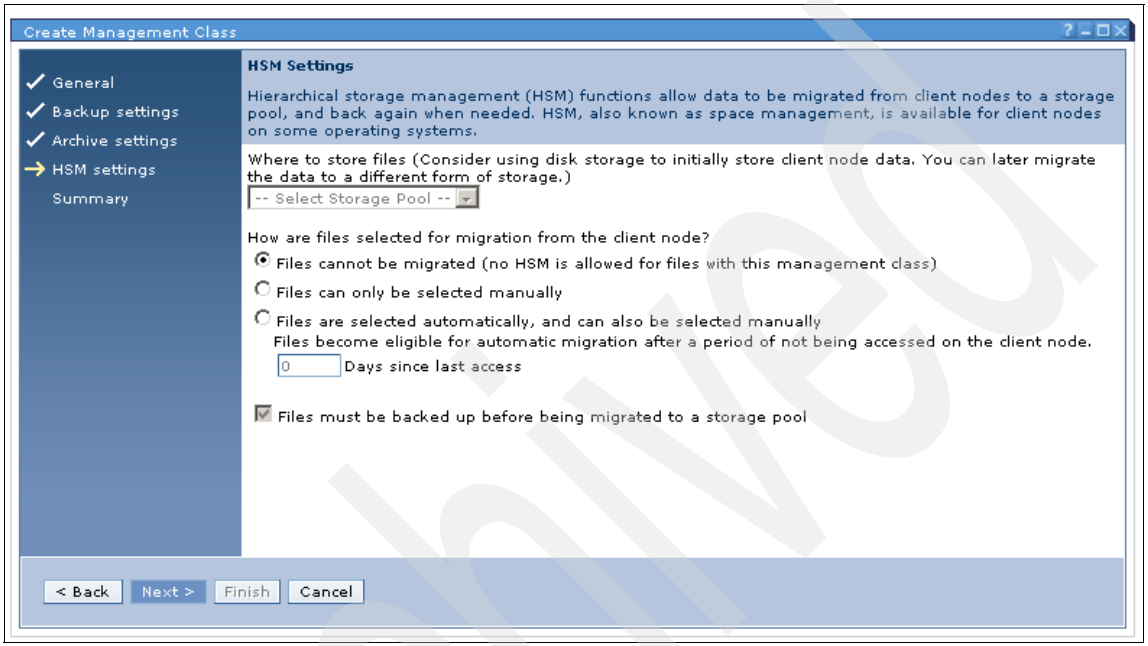


Figure 23-118 Create Management Class Wizard - HSM Settings

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.

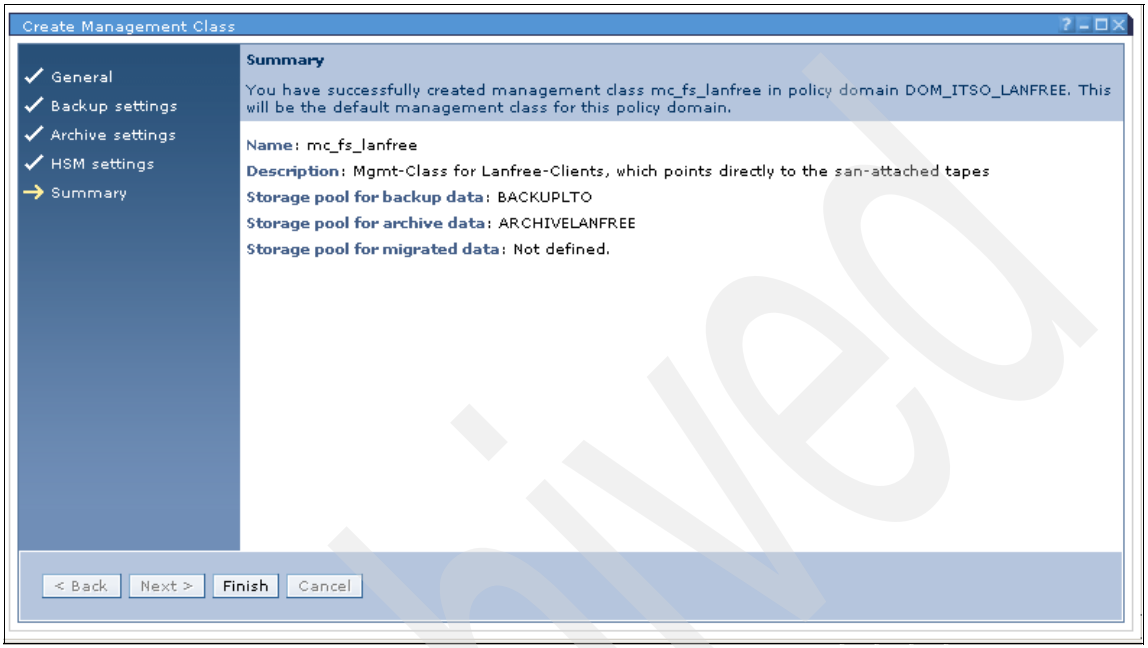


Figure 23-119 Create Management Class Wizard - Summary

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>

tsm: POLONIUM1>validate lanfree crete sa_crete
ANR0387I 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    STANDARD   BACKUPLANFR- No        Library not set to
                                     EE                     SHARED=YES for
                                                            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.

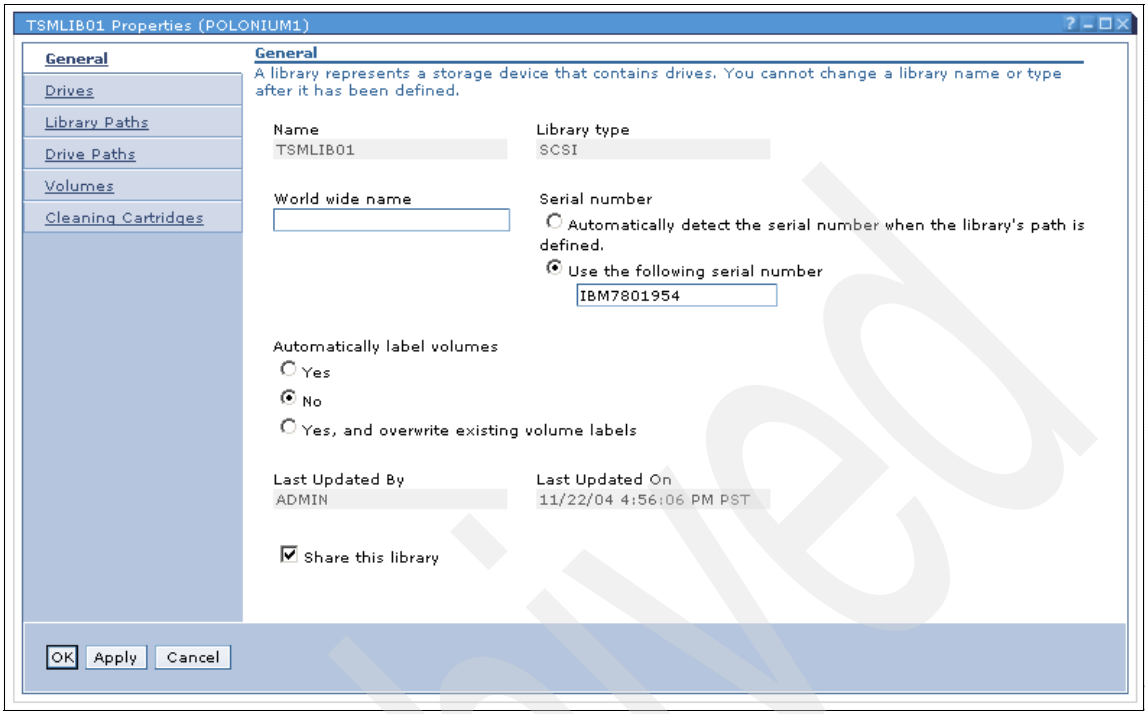


Figure 23-121 Library Properties - enable library sharing

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: POLONIUM1>validate lanfree crete sa_crete
ANR0387I 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
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.
```

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.

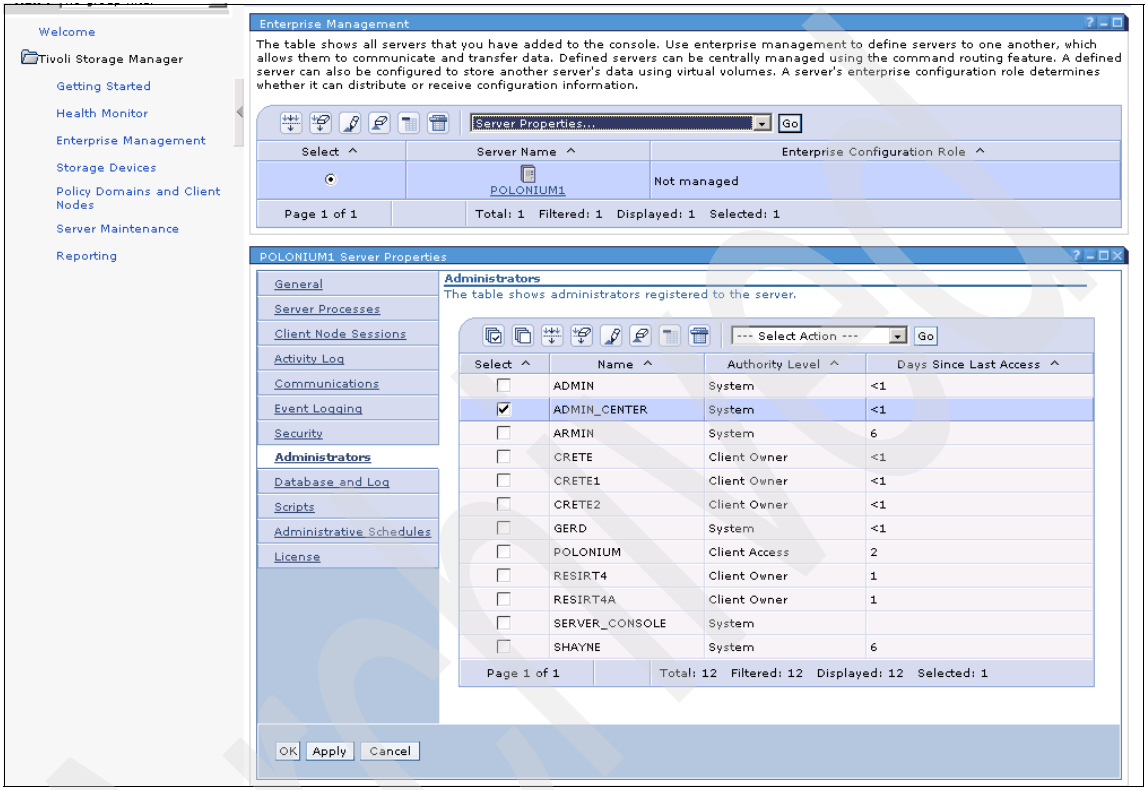


Figure 23-123 Server Properties view showing Administrators

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.

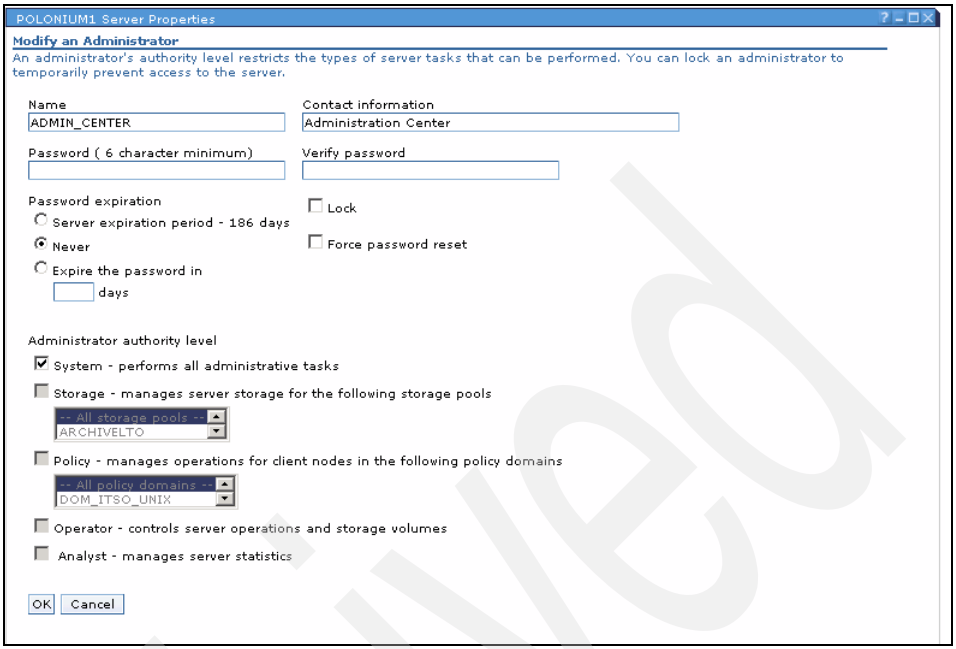


Figure 23-124 Ensure account is not locked

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.

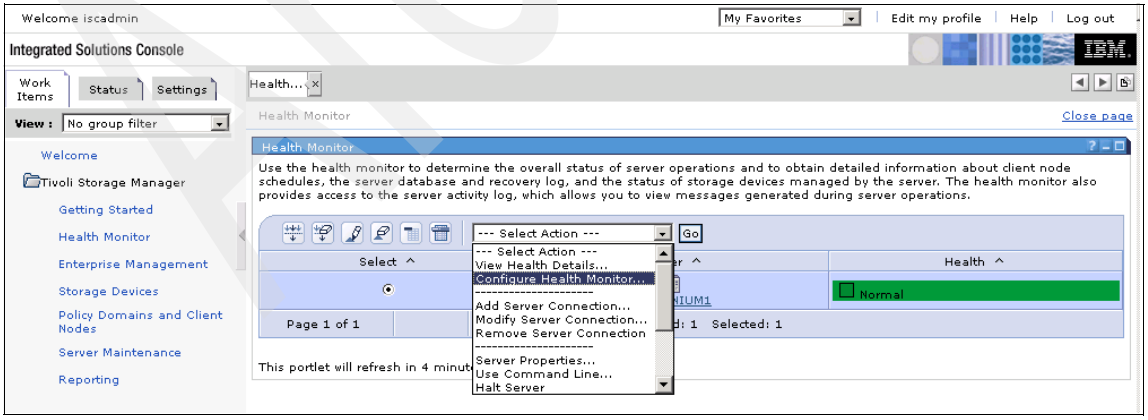


Figure 23-125 Configure Health Monitor

4. Enter the password and refresh interval to enable the Health Monitor, as shown in Figure 23-126.

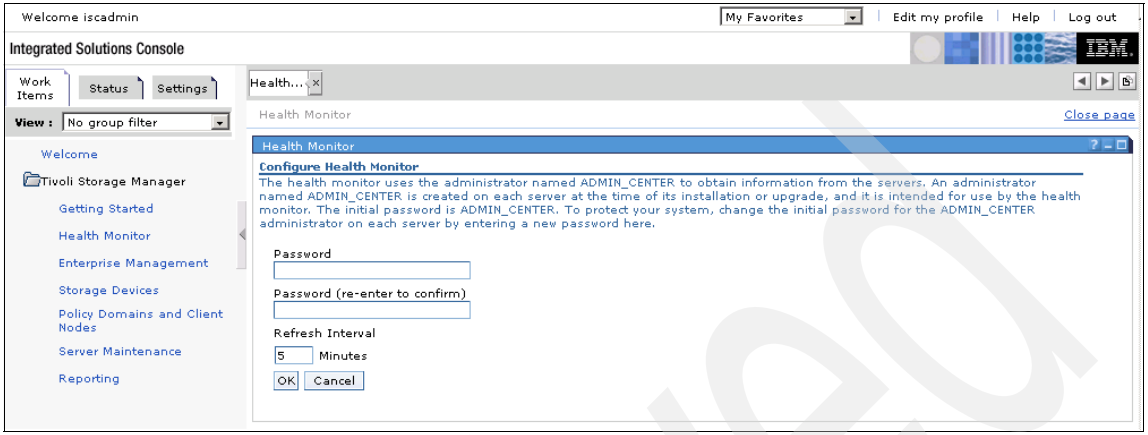


Figure 23-126 Enter password and refresh interval

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**.

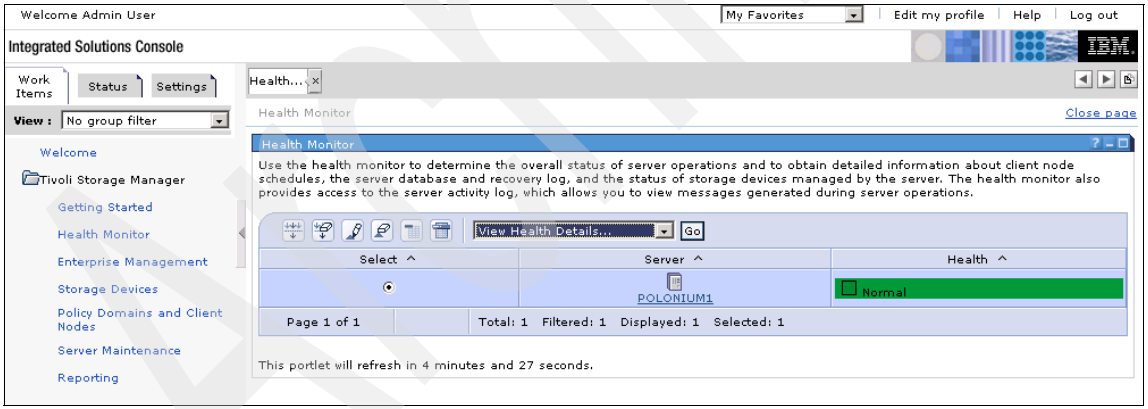


Figure 23-127 Health monitor drop-down selection

7. Select the **Health Monitor** drop-down to display more details, as shown in Figure 23-128.

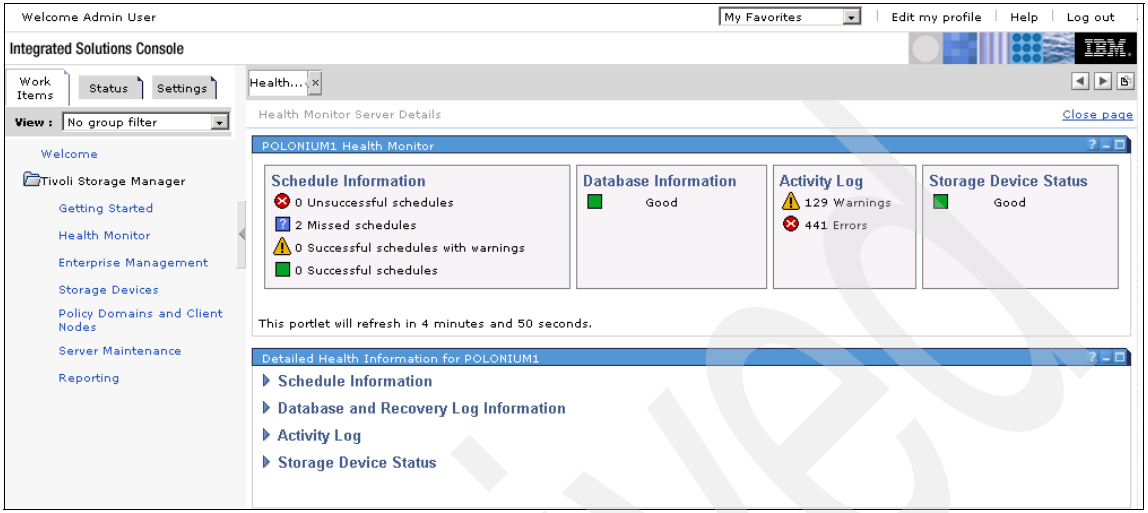


Figure 23-128 Health monitor details

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.

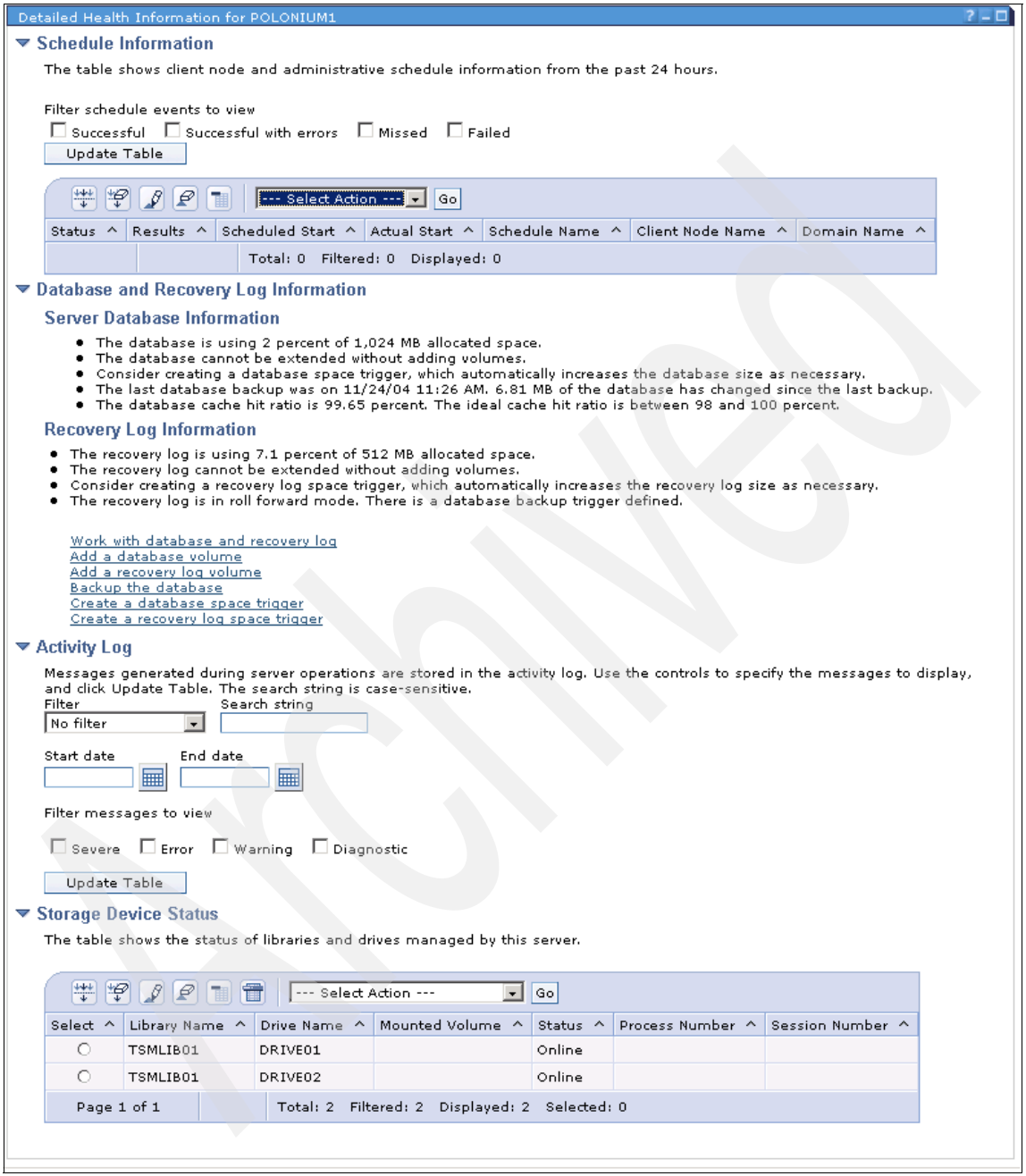


Figure 23-129 Expanded view of Health Monitor Details

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.

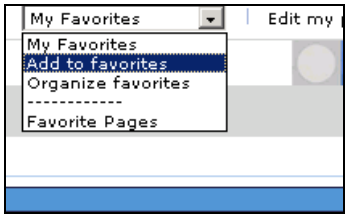


Figure 23-130 Favorites drop-down list

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.

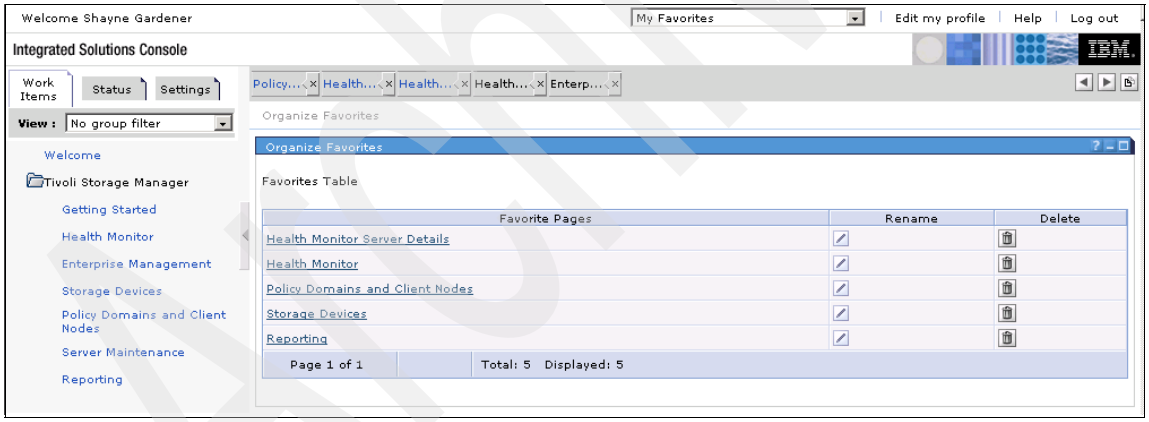


Figure 23-131 Organize Favorites

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.

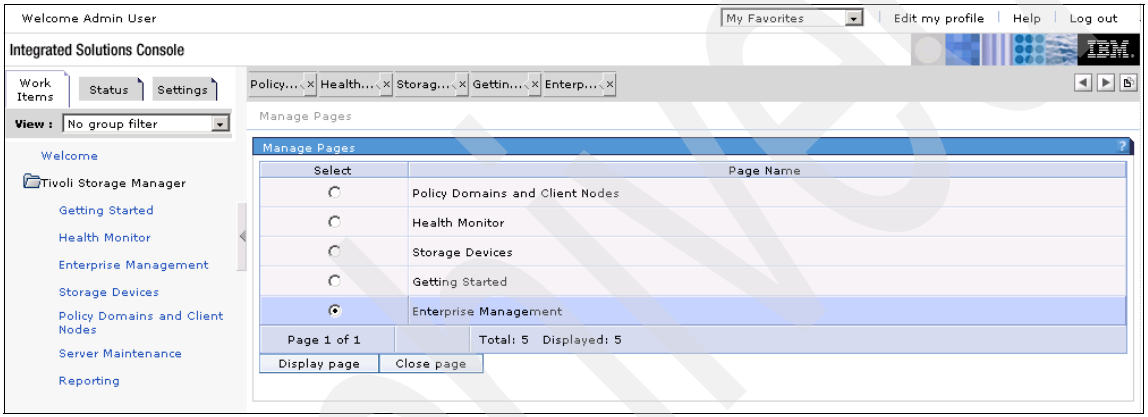


Figure 23-133 Manage pages in Page Navigation Bar

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™ 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.

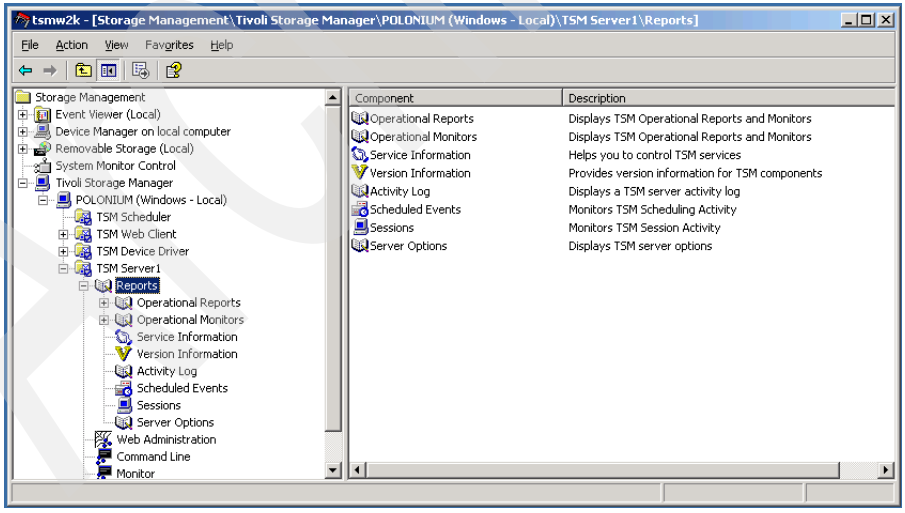


Figure 24-1 MMC View showing Operational Reporting elements

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.

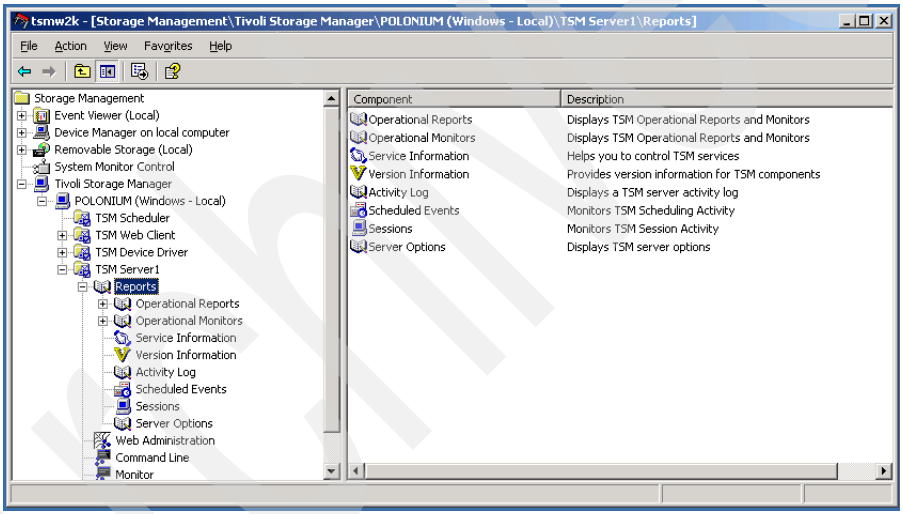


Figure 24-2 MMC view of Tivoli Storage Manager Server - Reports

2. Right-clicking the Operational Reports icon after expanding the MMC view produces a menu as shown in Figure 24-3.

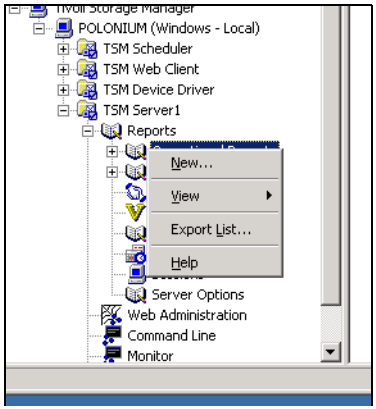


Figure 24-3 Right click menu

3. Click **New** to open the dialog box shown in Figure 24-4.

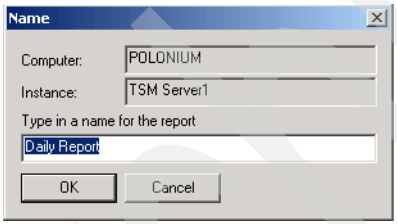


Figure 24-4 Enter Report name

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.

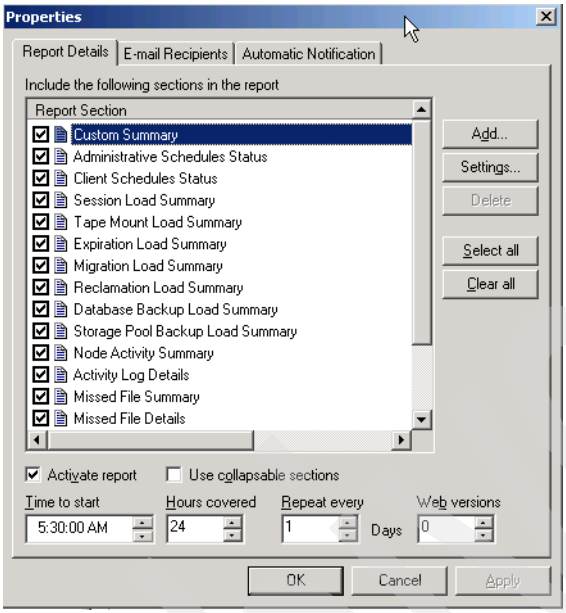


Figure 24-5 Select Report Sections for report

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.

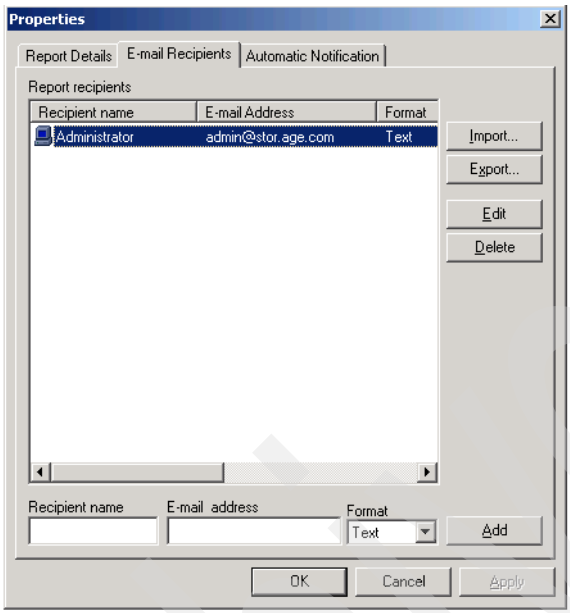


Figure 24-6 Add E-mail recipients

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.

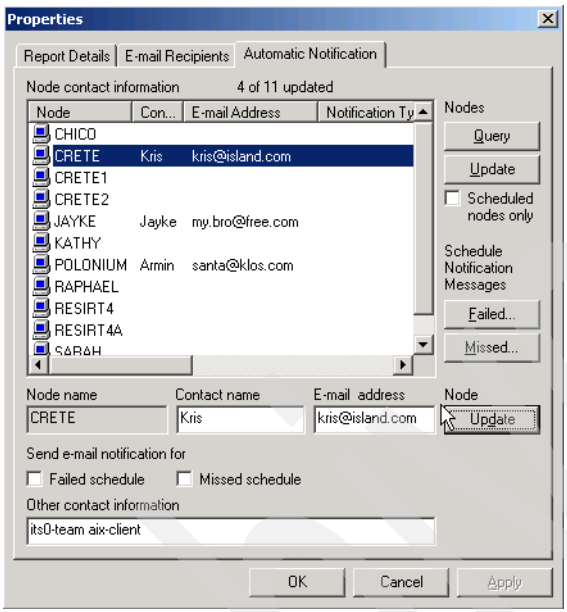
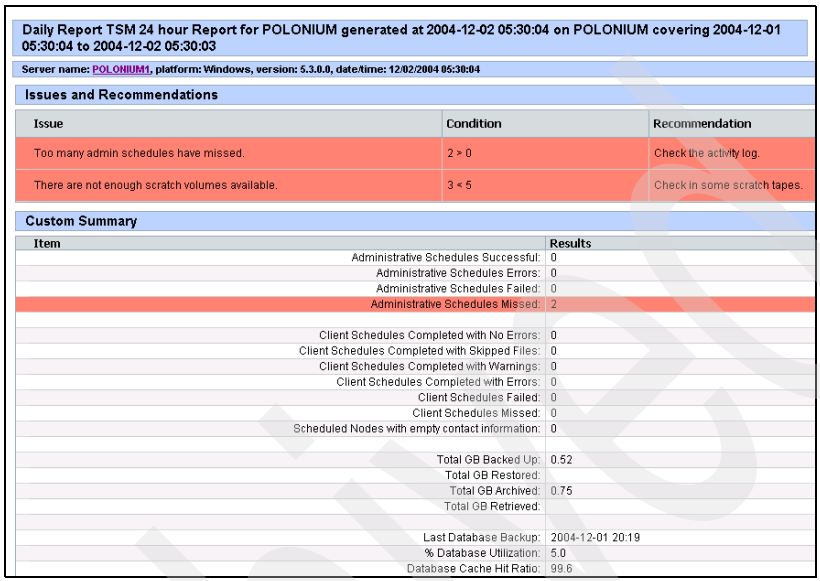


Figure 24-7 Choose Automatic Notification recipients for specific nodes

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.



Daily Report TSM 24 hour Report for POLONIUM generated at 2004-12-02 05:30:04 on POLONIUM covering 2004-12-01 05:30:04 to 2004-12-02 05:30:03

Server name: POLONIUM1, platform: Windows, version: 5.3.0.0, date/time: 12/02/2004 05:30:04

Issues 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
Administrative Schedules Successful:	0
Administrative Schedules Errors:	0
Administrative Schedules Failed:	0
Administrative Schedules Missed:	2
Client Schedules Completed with No Errors:	0
Client Schedules Completed with Skipped Files:	0
Client Schedules Completed with Warnings:	0
Client Schedules Completed with Errors:	0
Client Schedules Failed:	0
Client Schedules Missed:	0
Scheduled Nodes with empty 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
Database 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.

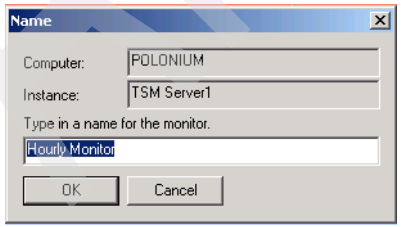


Figure 24-9 Create new Hourly Monitor

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

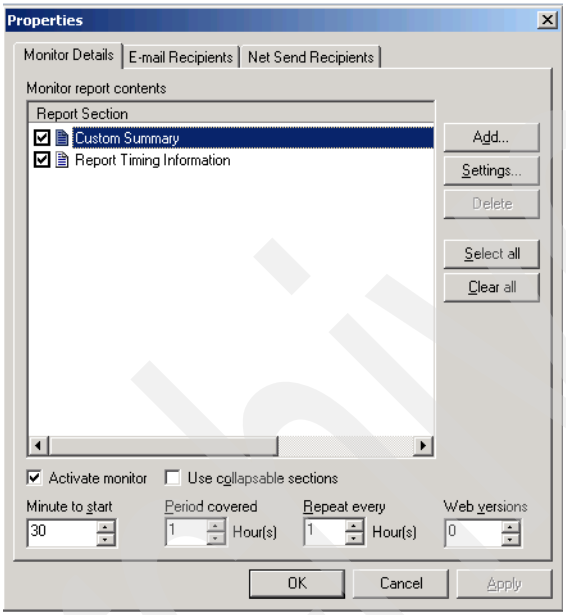


Figure 24-10 Monitor details

4. Add E-mail recipients as shown in Figure 24-11.

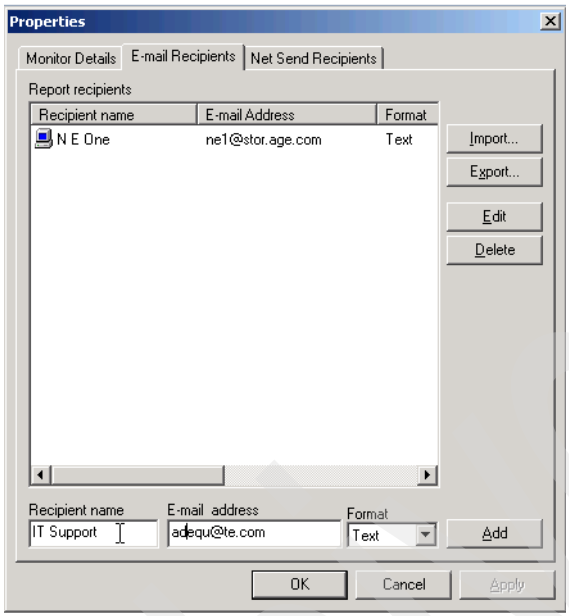


Figure 24-11 E-mail recipient information

5. 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.

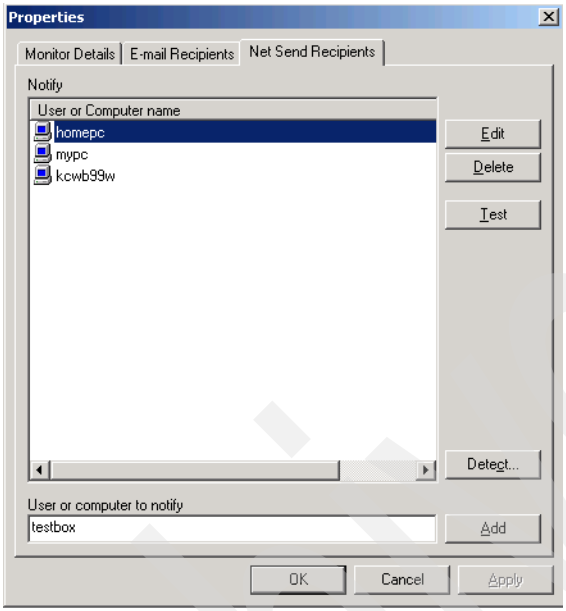


Figure 24-12 Net send recipients

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.

A

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*.

Table A-1 Functions available - virtualnodename, fromnode, and asnodename

Function	virtualnodename	fromnode	asnodename
Backup	X		X
Archive	X		X
Restore	X	X	X
Retrieve	X	X	X

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 *passwordaccess* option is *generate*.
The advantage of using the *virtualnodename* option over changing the *nodename* is that *the password prompted for is not saved on the system*.

fromnode The *fromnode* option permits one node to perform commands for another node. A user on another node must use the **set access** 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 *not prompted for a password*. You limited to the query, restore, and retrieve operations which are non-destructive to the original node data.

asnodename Use the *asnodename* 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 **grant proxynode** command. Authentication is then based on the nodename using the *asnodename* 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.

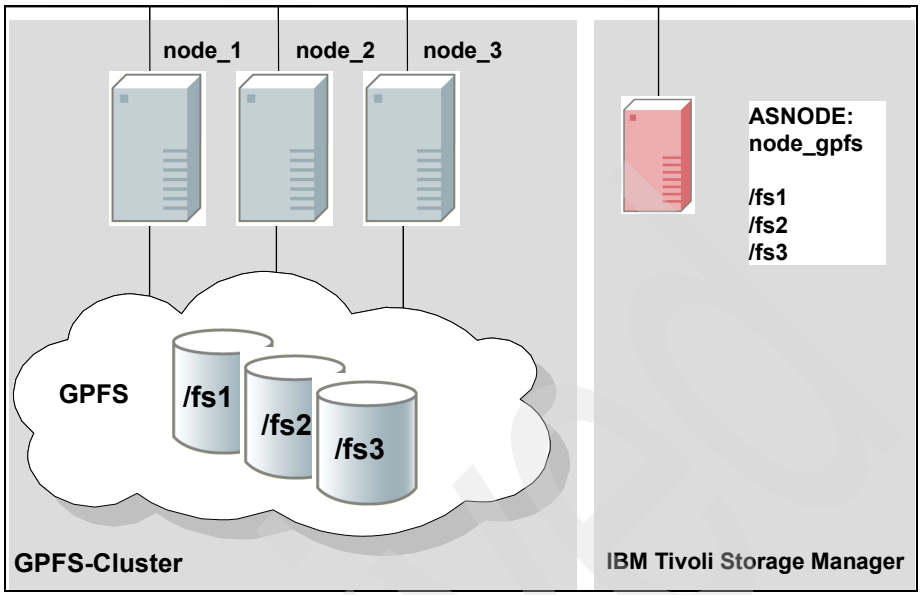


Figure A-1 Cluster using GPFS and ASNODENAME

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 /ssa1 /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
```

6. 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
#ln -s /usr/tivoli/tsm/client/ba/bin/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/dsmadmc
 6968    0 lrwxrwxrwx   1 root     system           38 Nov 24 08:55 dsmagent ->
/usr/tivoli/tsm/client/ba/bin/dsmagent
 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.

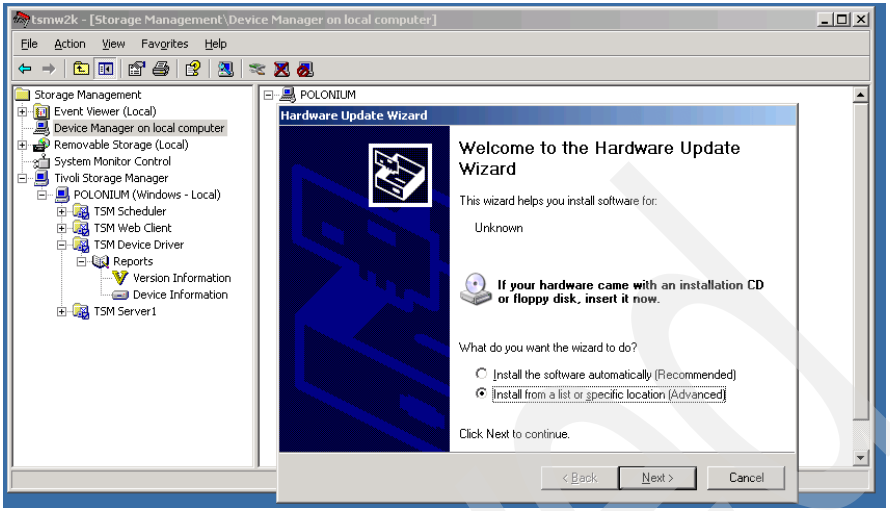


Figure A-2 Install from specific location

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

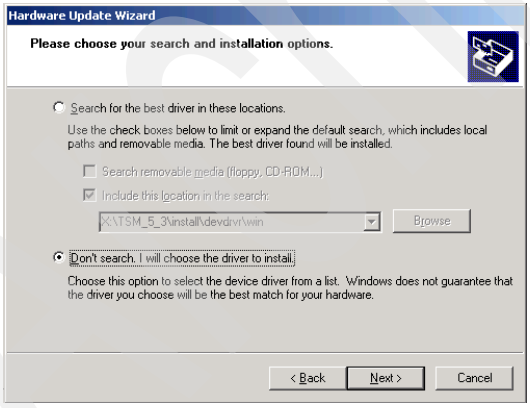


Figure A-3 Do not search for driver

5. Choose **Tape Drives** or **Medium Changers** as appropriate from the hardware type list shown in Figure A-4and click **Next**

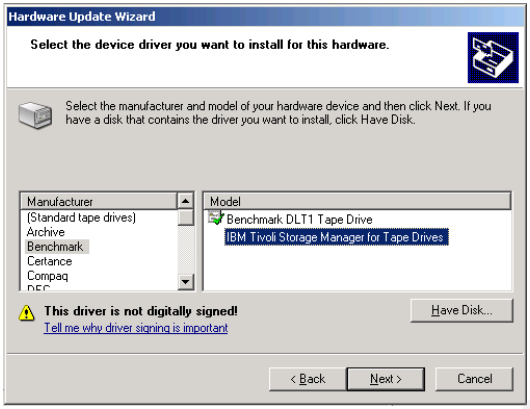


Figure A-4 Select device driver

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.

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.

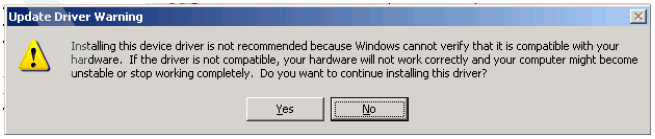


Figure A-5 Final warning

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.

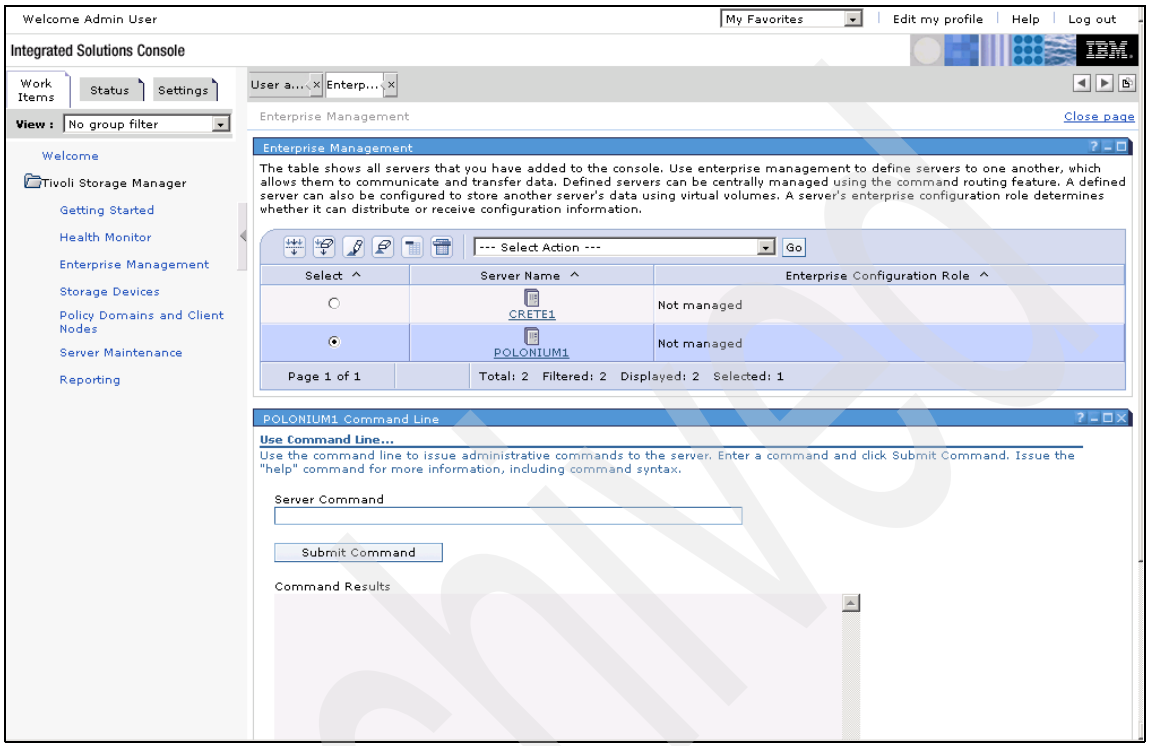


Figure A-6 Administration Center showing Command Line

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** → **Node Access List...** from the Web client interface. The window shown in Figure A-7 is displayed.

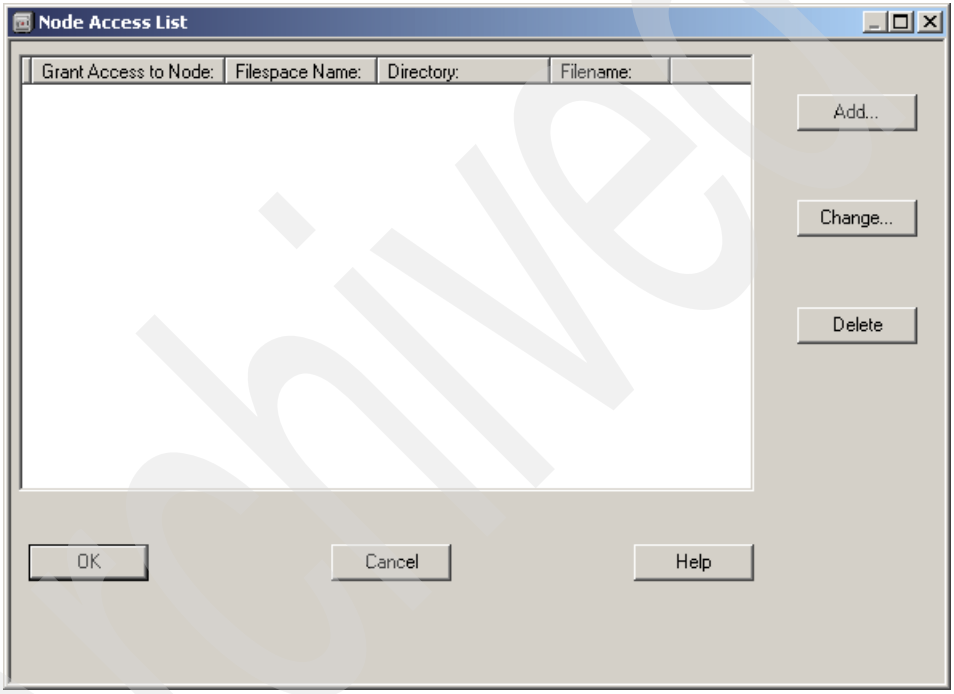


Figure A-7 Web client: Node access list

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.

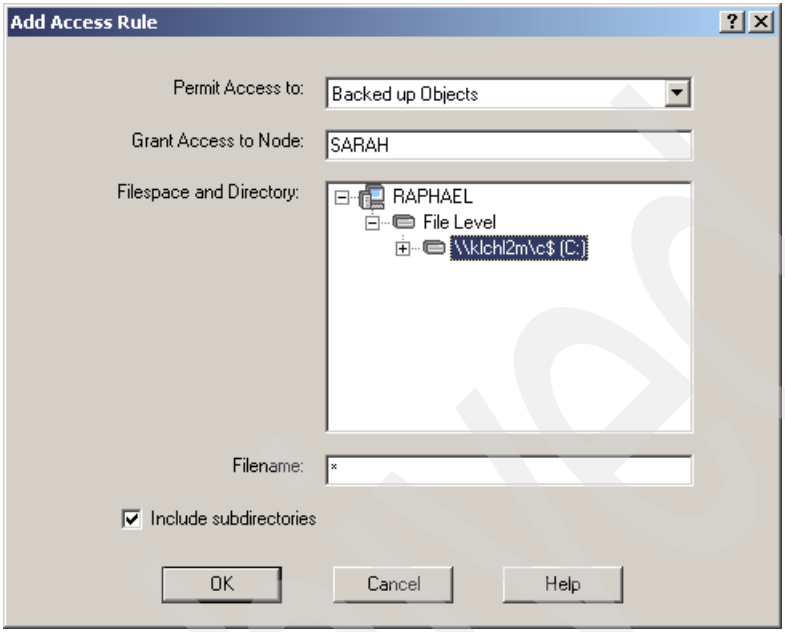


Figure A-8 Web client: Granting access to another node for filespace or directory

Having granted another node access to your filesystem or directory, this node is added to the Node Access List illustrated in Figure A-9.

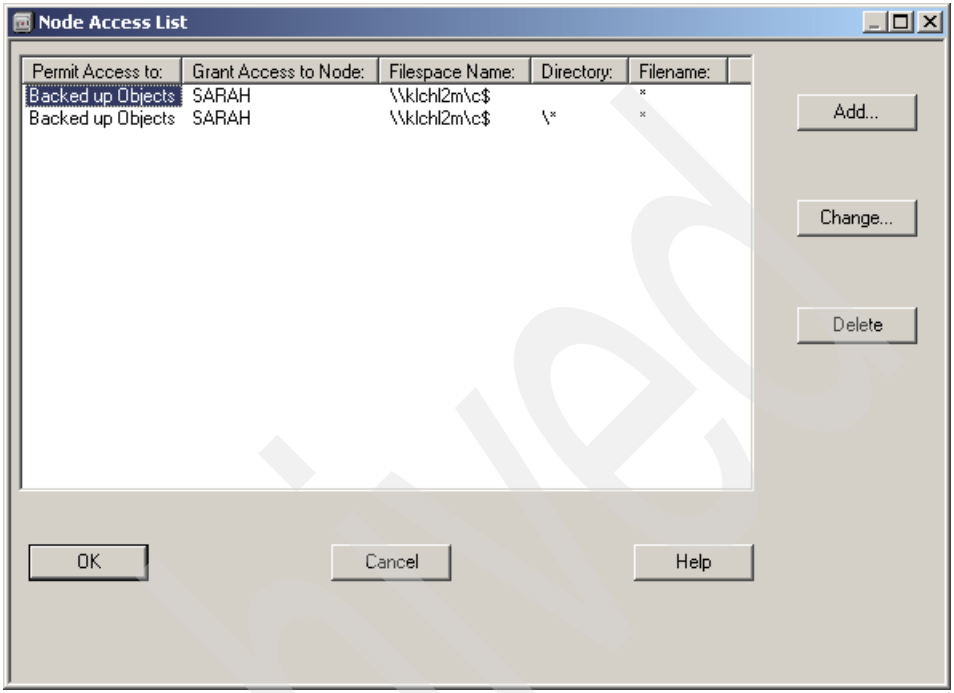


Figure A-9 Web client: Node access list with added node

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 Backup \\klchl2m\c$\* CHICO
ANS1148I 'Set Access' command successfully completed
tsm> Set Access Backup \\klchl2m\c$\*\* CHICO
ANS1148I 'Set Access' command successfully completed
tsm> q ac
Type     Node         User        Path
----     ----------------------------
Backup   SARAH                    \\klchl2m\c$\*
Backup   SARAH                    \\klchl2m\c$\*\*
Backup   CHICO        *           \\klchl2m\c$\*
Backup   CHICO        *           \\klchl2m\c$\*\*

ANS1148I 'Query Access' command 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** → **Access Another Node...** from the Web client interface. The dialog box is shown in Figure A-10.

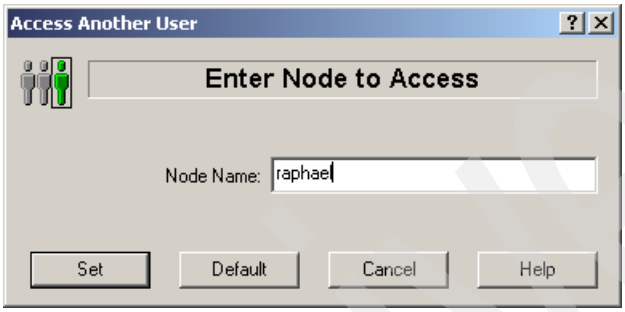


Figure A-10 Web client: Access another node

You can then verify access to the data of another node by selecting **File** → **Connection Information**, as shown in Figure A-11.

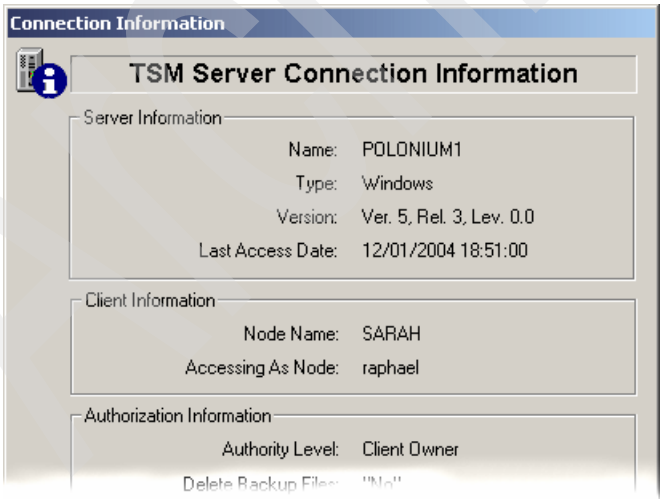


Figure A-11 Web client: checking Connection Information: Accessing As Node

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.

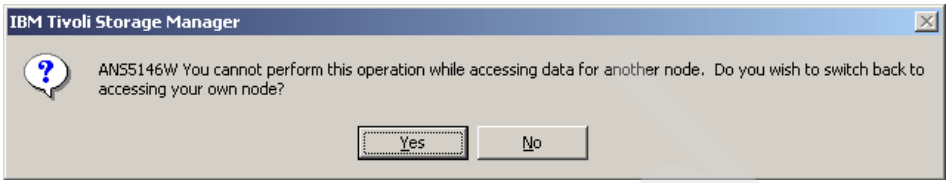


Figure A-12 Web client: Access another node: warning message

By clicking **Restore**, you can then restore the files of the other node, as shown in Figure A-13.

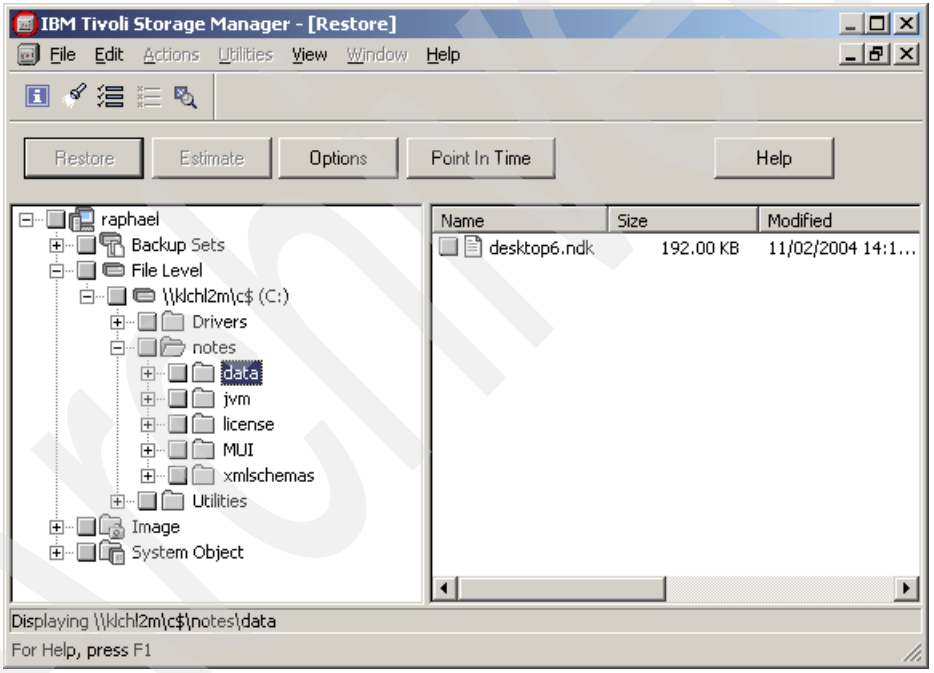


Figure A-13 Access Another Node: Restore file list

B

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.

Table B-1 Administrator

Task	Path
Add an administrator	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrators** tab. 4. In the Administrators table, click **Select Action**, select **Add Administrator**, and click **Go**.
Remove an administrator	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrators** tab. 4. In the Administrators table, select an administrator. 5. Click **Select Action**, select **Remove Administrator**, and click **Go**.
Grant an administrator access to the Administration Center	1. Click the **Settings** tab above the Work Items list. 2. In the Settings list, click **User and Group Management**. 3. In the Root table, click **•all portal user groups•**. 4. In the •all portal user groups• table, click **TSM_AdminCenter**. 5. In the TSM_AdminCenter portlet, click **New user**.
Lock/unlock an administrator	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrators** tab. 4. In the Administrators table, select an administrator. 5. Click **Select Action**, select **Modify Administrator**, and click **Go**.
Rename an administrator	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **Administrators** tab. 4. In the Administrators table, select an administrator. 5. Click **Select Action**, select **Modify Administrator**, and click **Go**.

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	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Policy Domains table, select a server. 3. Click **Select Action**, select **Search for Client Node**, and click **Go**. 4. Click **Update Table** 5. In the Client Nodes table, click the name of a client node. 6. In the node's properties notebook, click the **Security** tab.
Query the activity log for all messages about a particular client node	1. Click **Health Monitor** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's health information portlet, click **Activity Log**. 4. In the Filter list, click **No filter** and select **Client Node Name**. 5. In the Search string field, type the name of the client node. 6. Click **Update Table**. The activity log can also be displayed from the server's properties notebook.

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	1. Click **Health Monitor** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's health information portlet, click **Database and Recovery Log Information**.

Task	Path
Display details about database volumes, including the status of mirror volumes	1. Click **Health Monitor** 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 **Database and Log** tab. 5. In the Database table, click the name of a volume.
Specify the size of the database buffer pool	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **Database and Log** tab. 4. In the Database table, select a database volume. 5. Click **Select Action**, select **Database Properties**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries table, click a library name. 3. In the library's properties notebook, click the **Drives** tab. 4. In the Drives table, select a drive. 5. Click **Select Action**, select **Modify Drive**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **General** tab.

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	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, select a client node. 6. Click **Select Action**, select **Enable LAN-free Data Movement**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties notebook, click the **Volumes** tab. 4. In the Volumes table, click **Select Action**, select **Add Volumes**, and click **Go**.
Check out volumes from a library	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties notebook, click the **Volumes** tab. 4. In the Volumes table, click **Select Action**, select **Check Out Volumes**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Data Movers**, and click **Go**. 4. In the server's data movers table, click **Select Action**, select **Create NAS Data Mover**, and click **Go**.
Schedule NDMP backups for NAS file servers	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrative Schedules** tab. 4. Click **Select Action**, select **Create a Schedule**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **General** tab.

Script

Table B-10 shows quick paths to performing tasks concerning a script.

Table B-10 Script

Task	Path
Create a server script	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Scripts** tab. 4. In the Scripts table, click **Select Action**, select **Create Script**, and click **Go**.

Task	Path
Modify a server script	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Scripts** tab. 4. In the Scripts table, select a script. 5. Click **Select Action**, select **Modify Script**, and click **Go**.
Create a script that performs key maintenance tasks	1. Click **Server Maintenance** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Create a Maintenance Script**, and click **Go**.
Run a script	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **Scripts** tab. 4. In the Scripts table, select a script. 5. Click **Select Action**, select **Run Script**, and click **Go**.

Server

Table B-11 shows quick paths to performing tasks concerning a server.

Table B-11 Server

Task	Path
Rename a server	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Remove Server Connection**, and click **Go**. 4. Click **Select Action**, select **Add Server Connection**, and click **Go**.
Create a schedule for a server (administrative schedule)	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrative Schedules** tab. 4. In the Schedules table, click **Select Action**, select **Create a Schedule**, and click **Go**.
Modify a schedule for a server (administrative schedule)	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Administrative Schedules** tab. 4. In the Schedules table, select a schedule. 5. Click **Select Action**, select **Modify Schedule**, and click **Go**.

Task	Path
Issue a command to a server from the command line	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Use Command Line**, and click **Go**. The command line is also available from the Servers tables that are displayed by clicking the following items in the Work Items list: - **Health Monitor** - **Enterprise Management** - **Policy Domains and Client Nodes** - **Server Maintenance**
Set up one server as the configuration manager for other, managed servers	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Set Up Enterprise Configuration**, and click **Go**.
Set up server-to-server communication	Part A: 1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Server-to-Server Communication Settings**, and click **Go**. Part B: 1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the servers and server groups portlet, click **Servers**. 4. In the Servers table, click **Select Action**, select **Define Server**, and click **Go**.

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	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click a server name. 3. In the servers and server groups portlet, click **Server Groups**. 4. In the Server Groups table, click **Select Action**, select **Create a Server Group**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. Click **Select Action**, select **Add a Storage Device**, and click **Go**. The wizard helps you to create a library, drives, paths, a device class, and storage pools for the device.
View the status of a storage device	1. Click **Health Monitor** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's health information portlet, click **Storage Device Status**.

Storage pool

Table B-14 shows quick paths to performing tasks concerning a storage pool.

Table B-14 Storage pool

Task	Path
Display information about a storage pool volume	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, and click **Go**. 4. In the server's Storage Pools table, click the name of a storage pool. 5. In the storage pool's properties notebook, click the **Volumes** tab.
Rename a storage pool	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, and click **Go**. 4. In the server's Storage Pools table, select a storage pool. 5. Click **Select Action**, select **Modify Storage Pool**, and click **Go**.

Volume history

Table B-15 shows quick paths to performing tasks concerning volume history.

Table B-15 Volume history

Task	Path
Display volume history	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Volume History**, and click **Go**.
Modify volume history	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Volume History**, and click **Go**. 4. In the Volumes table, select a volume. 5. Click **Select Action**, select **Modify Volume History**, and click **Go**.
Backup volume history	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Volume History**, and click **Go**. 4. In the Volumes table, select a volume. 5. Click **Select Action**, select **Backup Volume History**, and click **Go**.

C

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.

Table C-1 Administrator

Task	Path
Create	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**.
View and modify	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, select an administrator. 6. Click **Select Action**, select **Modify Administrator**, and click **Go**.

Backup Set

Table C-2 shows the quick paths for the Backup Set.

Table C-2 Backup Set

Task	Path
Create	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's policy domains table, click a name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, click the name of a node. 6. In the node's properties notebook, click the **Backup Sets** tab. 7. In the Backup Sets table, click **Select Action**, select **Generate backup set**, and click **Go**.
View and modify	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's policy domains table, click a name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, click the name of a node. 6. In the node's properties notebook, click the **Backup Sets** tab. 7. In the Backup Sets table, select a backup set. 8. Click **Select Action**, select **Modify Backup set**, and click **Go**.

Client node (including its file spaces)

Table C-3 shows the quick paths for the client node and its file spaces.

Table C-3 Client node including file spaces

Task	Path
Create	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's policy domains notebook, click a domain name. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the table, click **Select Action**, select **Create a Client Node**, and click **Go**.
View and modify	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's policy domains notebook, click a domain name. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the table, select a node name. 6. In the table, click **Select Action**, select **Modify Client Node**, and click **Go**.

Data Mover

Table C-4 shows the quick paths for the Data Mover.

Table C-4 Data Mover

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. Click **Select Action**, select **View Data Mover**, and click **Go**. 4.In the server's data movers portlet, click **Select Action**, select **Create NAS Data Mover**, and click **Go**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Data Mover**, and click **Go**. 4. In the server's data movers portlet, select a data mover. 5. Click **Select Action**, select **Modify Data Mover**, and click **Go**.

Database space trigger

Table C-5 shows the quick paths for the database space trigger.

Table C-5 Database space trigger

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Database and Log** tab. 4. In the Database table, click **Select Action**, select **Create Space Trigger**, and click **Go**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3.In the server's properties notebook, click the **Database and Log** tab. 4. In the Database table, select a database volume. 5. Click **Select Action**, select **Modify Space Trigger**, and click **Go**.

Database volume

Table C-6 shows the quick paths for the database volume.

Table C-6 Database volume

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties notebook, click the **Database and Log** tab. 4.In the Database table, click **Select Action**, select **Add Volume**, and click **Go**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Database and Log** tab. 4. In the Database table, select a database volume. 5. Click **Select Action**, select Extend or Reduce, and click **Go**.

Device class

Table C-7shows the quick paths for the device class.

Table C-7 Device class

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. Click **Select Action**, select **View Device Class**, and click **Go**. 4. In the server's device classes portlet, click **Select Action**, select **Create a Device Class**, and click **Go**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Device Class**, and click **Go**. 4. In the server's device classes portlet, select a device class. 5. Click **Select Action**, select **Modify Device Class**, and click **Go**.

Drive

Table C-8 shows the quick paths for the drive.

Table C-8 Drive

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click the name of a library. 3. In the library's properties portlet, click the **Drives** tab. 4. In the table, click **Select Action**, select **Add a Drive**, and click **Go**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click the name of a library. 3. In the library's properties portlet, click the **Drives** tab. 4. In the table, select a drive. 5. Click **Select Action**, select **Modify Drive**, and click **Go**.

Library

Table C-9 shows the quick paths for the Library.

Table C-9 Library

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click **Select Action**, select **Create a Library**, and click **Go**. 3. In the Select a Server table, select a server and click **Create a Library**.
View and modify	1.Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, select a library. 3. Click **Select Action**, select **Modify Library**, and click **Go**.

Management class (including copy groups)

Table C-10 shows the quick paths for the management class.

Table C-10 Management class including copy groups

Task	Path
Create	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Management Classes**. 5. In the table, click **Select Action**, select **Create Management Class**, and click **Go**.
View and modify	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Management Classes**. 5. In the table, select a management class. 6. Click **Select Action**, select **Modify Management Class**, and click **Go**.

Option set

Table C-11 shows the quick paths for the option set.

Table C-11 Option set

Task	Path
Create	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Option Sets**. 5. In the table, click **Select Action**, select **Create an Option Set**, and click **Go**.
View and modify	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Option Sets**. 5. In the table, select an option set. 6. Click **Select Action**, select **Modify Option Set**, and click **Go**.

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	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Drive Paths** tab. 4. In the table, click **Select Action**, select **Add Path**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Drive Paths** tab. 4. In the table, select a drive path. 5.Click **Select Action**, select **Modify Path**, and click **Go**.

Path for a library

Table C-13 shows the quick paths for the path for a library.

Table C-13 Path for a library

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Library Paths** tab. 4. In the table, click **Select Action**, select **Add Path**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Library Paths** tab. 4. In the table, select a library path. 5.Click **Select Action**, select **Modify Path**, and click **Go**.

Policy Domain

Table C-14 shows the quick paths for the Policy Domain.

Table C-14 Policy domain

Task	Path
Create	1. Click **Policies and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3.In the server's policy domains notebook, click **Select Action**, select **Create a Policy Domain**, and click **Go**.
View and modify	1. Click **Policies and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, select the name of a domain. 4. Click **Select Action**, select **Modify Policy Domain**, and click **Go**.

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 configuration manager server

Task	Path
Create	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server that is a configuration manager. 3. In the server's profiles table, click **Select Action**, select **Create Profile**, and click **Go**.
View and modify	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server that is a configuration manager. 3. In the server's profiles table, select a profile. 4. Click **Select Action**, select **Modify Profile**, and click **Go**.

Recovery log space trigger

Table C-16 shows the quick paths for the recovery log space trigger.

Table C-16 Recovery space log trigger

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties notebook, click the **Database and Log** tab. 4. In the Recovery Log table, click **Select Action**, select **Create Space Trigger**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties portlet, click the **Database and Log** tab. 4. In the Recovery Log table, select a recovery log. 5. Click **Select Action**, select **Modify Space Trigger**, and click **Go**.

Recovery log volume

Table C-17 shows the quick paths for the recovery log volume.

Table C-17 Recovery log volume

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Database and Log** tab. 4. In the Recovery Log table, click **Select Action**, select **Add Volume**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Database and Log** tab. 4. In the Recovery Log table, select a recovery log volume. 5. Click **Select Action**, select **Extend** or **Reduce**, and click **Go**.

Schedule for client nodes

Table C-18 shows the quick paths for the schedule for client nodes.

Table C-18 Schedule for client nodes

Task	Path
Create	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Node Schedules**. 5. In the table, click **Select Action**, select **Create a Schedule**, and click **Go**.
View and modify	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's policy domains notebook, click the name of a domain. 4. In the domain's properties portlet, click **Node Schedules**. 5. In the table, select a schedule. 6. Click **Select Action**, select **Create a Schedule**, and click **Go**.

Schedule for a server (administrative schedule)

Table C-19 shows the quick paths for the schedule for a server.

Table C-19 Administrative schedule for a server

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's properties portlet, click the **Administrative Schedules** tab. 4. In the table, click **Select Action**, select **Create a Schedule**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Administrative Schedules** tab. 4. In the table, select a script. 5. Click **Select Action**, select **Modify Schedule**, and click **Go**.

Server (other Tivoli Storage Manager servers) Task

Table C-20 shows the quick paths for the server tasks.

Table C-20 Add or modify Server

Task	Path
Create	1.Click **Enterprise Management** in the Work Items list. 2. In the table, click **Select Action**, select **Add Server Connection**, and click **Go**.
View and modify	1. Click **Enterprise Management** in the Work Items list. 2. In the table, select a server. 3. Click **Select Action**, select **Modify Server Connection**, and click **Go**.

Server group

Table C-21 shows the quick paths for the server group.

Table C-21 Server group

Task	Path
Create	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the servers and server groups portlet, click **Server Groups**. 4. In the Server Groups table, click **Select Action**, select Create a Server Group, and click **Go**.
View and modify	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the servers and server groups portlet, click **Server Groups**. 4. In the Server Groups table, select a server group. 5. Click **Select Action**, select **Modify a Server Group**, and click **Go**.

Server script

Table C-22 shows the quick paths for the server script.

Table C-22 Server script

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Scripts** tab. 4. In the table, click **Select Action**, select **Create Script**, and click **Go**. To get help in creating a script that performs key maintenance tasks: 1. Click **Server Maintenance** in the Work Items list. 2. In the table, click **Select Action**, select **Create a Maintenance Script**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, click a server name. 3. In the server's properties portlet, click the **Scripts** tab. 4. In the table, select a script. 5. Click **Select Action**, select **Modify Script**, and click **Go**. To modify a maintenance script: 1. Click **Server Maintenance** in the Work Items list. 2. In the table, select a maintenance script. 3. Click **Select Action**, select **Modify Maintenance Script**, and click **Go**.

Storage pool

Table C-23 shows the quick paths for the storage pool.

Table C-23 Storage pool

Task	Path
Create	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, and click **Go**. 4. In the server's storage pools portlet, click **Select Action**, select **Create a Storage Pool**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, and click **Go**. 4. In the server's storage pools portlet, select a storage pool. 5. Click **Select Action**, select **Modify Storage Pool**, and click **Go**.

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

Task	Path
Create	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a managed server. 3. In the server's Subscriptions table, click **Select Action**, select **Create Subscription**, and click **Go**.

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)	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Volumes** tab. 4. In the table, click **Select Action**, select **Add Volumes**, and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Libraries for all Servers table, click a library name. 3. In the library's properties portlet, click the **Volumes** tab. 4. In the table, select a volume. 5. Click **Select Action**, select **Modify Volume**, and click **Go**.

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

Task	Path
Create (check in, or check in and label)	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select View Storage Pools, and click **Go**. 4. In the server's storage pools portlet, click a storage pool name. 5. In the storage pool's properties notebook, click the **Volumes** tab. 6. In the volumes table, click **Select Action**, select **Add Volume,** and click **Go**.
View and modify	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select View Storage Pools, and click **Go**. 4. In the server's storage pools portlet, click a storage pool name. 5. In the storage pool's properties notebook, click the **Volumes** tab. 6. In the table, select a volume. 7. Click **Select Action**, select **Modify Volume or View Contents**, and click **Go**.

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.

Table D-1 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.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Set Up Enterprise Configuration**, and click **Go**.
Define a server	Used to enable server-to-server communications.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the Servers and Server Groups portlet, click **Servers**. 4. In the Servers table, click **Select Action**, select **Define Server**, and click **Go**.
Create a server group	Used to create a group of defined servers, which can be used to facilitate command routing.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the Servers and Server Groups portlet, click **Server Groups**. 4. In the Server Groups table, click **Select Action**, select **Create a Server Group**, and click **Go**.
Create a profile	Used to create new profiles for configuration manager servers.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server defined as a configuration manager. 3. In the server's Profiles table, click **Select Action**, select **Create Profile**, and click **Go**.
Create a subscription	Used to create new profile subscriptions for managed servers.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, click the name of a server defined as a managed server. 3. In the server's Profiles table, click **Select Action**, select **Create Subscription**, and click **Go**.

Wizard	Description	Path
Import or export a server	Used to import or export server definitions.	1. Click **Enterprise Management** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select either **Import Server** or **Export Server**, and click **Go**.
Create administrative schedule	Used to set up a schedule to perform administrative tasks.	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 **Administrative Schedules** tab. 5. In the Administrative Schedules table, click **Select Action**, select **Create a Schedule**, and click **Go**.
Import or export administrator	Used to import or export administrator definitions.	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, select the name of the administrator, click **Select Action**, select either **Import Administrator** or **Export Administrator** and click **Go**.

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.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Add a Storage Device**, and click **Go**.
Create a library	Provides a fast way to define a library and its drives.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Create Library**, and click **Go**.

Wizard	Description	Path
Create a device class	Used to create a device class, which represents a set of storage devices with similar characteristics.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Device Classes**, and click **Go**. 4. In the server's Device Classes table, click **Select Action**, select **Create a Device Class**, and click **Go**.
Create a storage pool	Used to set up a primary or copy storage pool for use.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, and click **Go**. 4. In the server's Storage Pools table, click **Select Action**, select **Create a Storage Pool**, and click **Go**.
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).	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Data Movers**, and click **Go**. 4. In the server's Data Movers table, click **Select Action**, select **Create NAS Data Mover**, and click **Go**.
Create a collocation group	Used to create a collocation group to store data for selected client nodes on as few volumes as possible.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, click **View Collocation Groups**, and click **Go**. 4. In the server's Collocations Groups table, click **Select Action**, select **Create Collocation Group**, and click **Go.**
Add volumes	Used to check volumes into the library inventory, and label them if necessary. Also used to label volumes without checking them in.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. In the Libraries for All Servers table, click the name of a library, select the **Volumes** tab. 4. In the library Properties table, click **Select Action**, select **Add Volumes**, and click **Go**.
Restore volumes	Used to restore all files on damaged volumes in a primary storage pool that was backed up to a copy storage pool.	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Storage Pools**, click **Go**. 4. In the server's Storage Pools table, select a storage pool. 5. Click **Select Action**, select **Restore Volumes**, and click **Go**.

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).	1. Click **Storage Devices** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **View Volume History**, and click **Go**. 4. In the Volume History table, select a volume. 5. Click **Select Action**, select **Delete Volume History**, and click **Go**.

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.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, click **Select Action**, select **Create a Client Node**, and click **Go**.
Create client node schedule	Used to set up a schedule for automating client node operations.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Node Schedules**. 5. In the Schedules table, click **Select Action**, select **Create a Schedule**, and click **Go**.

Wizard	Description	Path
Create a management class	Used to create a new management class.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Management Classes**. 5. In the Management Classes table, click **Select Action**, select **Create Management Class**, and click **Go**.
Create an option set	Used to create an option set, which allows you to centrally manage many client node processing options.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Option Sets**. 5. In the Option Sets table, click **Select Action**, select **Create an Option Set**, and click **Go**.
Create a policy domain	Used to create a policy domain with a default management class.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click **Select Action**, select **Create a Policy Domain**, and click **Go**.
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.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, select a client node. 6. Click **Select Action**, select **Enable LAN-free Data Movement**, and click **Go**.

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.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, click the name of a client node. 6. In the node's properties notebook, click the **Backup Sets** tab. 7. In the Backup Sets table, click **Select Action**, select **Generate Backup Set**, and click **Go**.
Import or export client node	Used to import or export client node definitions.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, select a client node. 6. Click **Select Action**, select either **Import Client Node** or **Export Client Node**, and click **Go**.
Import or export policy domain	Used to import or export policy domain definitions.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the Policy Domains table, select a domain. 4. Click **Select Action**, select either **Import Policy Domain** or **Export Policy Domain**, and click **Go**.
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.	1. Click **Policy Domains and Client Nodes** in the Work Items list. 2. In the Servers table, click the name of a server. 3. In the server's Policy Domains table, click the name of a domain. 4. In the domain's properties portlet, click **Client Nodes**. 5. In the Client Nodes table, click the name of a NAS client node. 6. In the NAS client's Properties notebook, click the **File Spaces** tab. 7. In the File Spaces table, click **Select Action**, select **Restore by File Name**, and click **Go**.

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.	1. Click **Server Maintenance** in the Work Items list. 2. In the Servers table, select a server. 3. Click **Select Action**, select **Create maintenance script** and click **Go**.

E

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.

Table E-1 Basics of 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?	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: ► Scheduled events ► The server database and recovery log (using rules based on best practices) ► Storage devices, including information about offline drives and paths, and mounted volumes. ► You can filter and sort storage objects, such as client nodes and library volumes. ► You can use wizards to more easily perform complex tasks, such as: ► Creating schedules to perform client node and administrative operations. ► Creating a server maintenance script to perform database and storage pool backup, migration, expiration, and reclamation. ► Configuring storage devices. A comprehensive wizard helps you create a library, add drives, check in media volumes, and create storage pools.
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.

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 **Getting Started** 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?	These are the basic steps: 1. Install and start your Tivoli Storage Manager Version 5.3 servers. Give each server a unique name. 2. Install the Integrated Solutions Console. During the installation process, create an Integrated Solutions Console user ID and password. 3. Install the Administration Center on the same system as the Integrated Solutions Console. 4. Log in to the Integrated Solutions Console using a Web browser. 5. Add connections for the Tivoli Storage Manager servers you want to manage. 6. Create additional Integrated Solutions Console user IDs and passwords for any other administrators who will access the Administration Center. 7. For details, see the Tivoli Storage Manager Installation Guide and the Getting Started work item in the Administration Center.

Installation

Table E-2 answers some common questions you may have about installing the Administration Center.

Table E-2 Installation of 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?	The following operating systems are supported: ► AIX 5.1 or 5.2 ► Sun Solaris 8 ► SuSE Linux Enterprise Server 8 Powered by ► United Linux 1.0 (for Intel only) ► Red Hat Linux Advanced Server 2.1 (for Intel only) ► Windows 2000 Server and Advanced Server ► Windows Server 2003 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/IBMTivoliStorageManagerVersionRelease.html

What are the basic installation requirements?	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: ► For the Administration Center: 512 MB ► 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 Other memory requirements, such as those for the 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: 512 MB for the Administration Center 89 MB for the Tivoli Storage Manager server (32 + 32 + 25) 256 MB for the operating system ---------- 857 MB total See the Installation Guide for detailed 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.

Table E-3 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**.

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?	Using unique names for your Tivoli Storage Manager servers is a best practice. The Administration Center enforces this practice for the following reasons: ► Several Administration Center features rely on server-to-server communications, which requires unique server names. ► Because the Administration Center allows you to work with multiple servers from a single interface, using unique names helps to avoid confusion.
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 Use the search term 1193324.

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.

Table E-4 Troubleshooting and additional information

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/tivihelp/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/IBMTivoliStorageManagerVersionRelease.html

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

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

Changes	A	H	L	S	W	N	M
Enhanced domain processing	x	x	x	x	x	x	
Enhanced query backup and query archive commands	x	x	x	x	x	x	
New backup-archive option to preserve last access date of files	x	x	x	x	x		
Support for a globally unique identifier (GUID)	x	x	x	x	x		
64-bit support for the Storage Manager HP-UX client		x					
Linux86 client support for the General Parallel File System (GPFS)			x				
LAN-free data movement support on linux86 client			x				
Storage Agent 5.1 (October 2002) - for Linux!!!			x				
Support for excluding specific system objects from backup processing					x		
Enhanced image backup and restore processing (Windows 2000 only)					x		
Ignore NTFS compression attribute					x		
Support for DBCS installation path on Unicode-enabled clients					x		
Support for monitoring or cancelling server-free operations (Windows 2000)					x		
Support for Novell Cluster Services						x	
No changes introduced in 5.1.5 to the Mac OS X							N/A

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	A	H	L	S	W	N	M
Enhanced firewall security	x	x	x	x	x	x	
Enhancements for command line image restore operations	x	x	x	x	x		

Changes	A	H	L	S	W	N	M
Enhancements for the query filespace command	x	x	x	x	x		
Enhancements to the Web client interface	x	x	x	x	x	x	
NDMP file-level restore	x	x	x	x	x		
Separately installable language packs available	x	x	x	x	x		
Support for an external snapshot provider in the backup-archive clients	x	x	x	x	x	x	
Support for backing up files from one or more file space origins	x	x	x	x	x	x	
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	x	x	x	
Support for gathering Tivoli Storage Manager system information	x	x	x	x	x		
Support for processing EMC Celerra Network Attached Storage (NAS) file system images	x	-	-	x	x		
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			x				
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					x		
Support for Microsoft Volume Shadowcopy Service (VSS) on Windows Server 2003					x		
Tivoli Storage Manager command line and GUI display actual image size stored on Tivoli Storage Manager server					x		
Enhanced ALL-LOCAL domain processing [NDS replica]						x	
Autofsrename							x
Inclexcl							x
Migrating to the Unicode-enabled client							x

Table of Version 5.2.2 TSM Client enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

Changes	A	H	L	S	W	N	M
Language support expanded to include Russian, Hungarian, Polish, and Czech	x	x	x	x	x		
Multi-session backup session enhancements	x	x	x	x	x	x	x
Removal of operand limits for backup and archive operations	x	x	x	x			x
Support for WebSphere Application Server (WAS) security	x	-	x	x	x		
Support for controlling symbolic link processing	x	x	x	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			x				
Support for Veritas Cluster Server cluster environment					x		
Backup and restore support for IBM TotalStorage SAN File System [Win2000 Client]					x		
Support for Novell NetWare 6.5 operating system						x	
Enhanced firewall security							x
Support for a Tivoli Storage Manager command line interface							x
Support for a Tivoli Storage Manager administrative client							x
Support for controlling symbolic link and alias processing							x
Support for displaying options and their settings via the command line [avail. since 5.1.5 for all others]							x
Support for encrypting data during backup or archive operation							x
Support for gathering Tivoli Storage Manager system information [avail. since 5.1.5 for all others]							x
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

Table of Version 5.3 TSM Client enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, N=Netware, M=Mac OS X

Changes	A	H	L	S	W	N	M
Dynamic client tracing	x	x	x	x	x		N/A
Enhanced encryption	x	x	x	x	x		N/A
Enhancements to query schedule command	x	x	x	x	x	x	N/A
Include-exclude enhancements	x	x	x	x	x	x	N/A
New links from the backup-archive client Java GUI to the Tivoli Storage Manager and Tivoli Home Pages	x	x	x	x	x		N/A
New options, Errorlogmax and Schedlogmax, and DSM_LOG environment variable changes	x	x	x	x	x		N/A
Optimized option default values	x	x	x	x	x	x	N/A
Support for deleting individual backups from a server file space	x	x	x	x	x	x	N/A
Tivoli Storage Manager Administration Center	x	x	x	x	x	x	N/A
Web client enhancements (and Java GUI in UNIX)	x	x	x	x	x	x	N/A
Client node proxy support [asnodename]	x	x	x	x			N/A
Tivoli Storage Manager backup-archive client for HP-UX Itanium 2		x					N/A
Linux for zSeries offline image backup			x				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						x	N/A

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	A	H	L	S	W	O	Z
Additional O/S platform support			x			x	

Table of Version 5.2 TSM TSM Server enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
Accurate SAN Device Mapping	x	x	x	x	x		
Device Driver for Windows Server 2003					x		
IBM Device Driver for 3570, 3590, and IBM LTO Devices					x		
Increased Archive Retention Limits	x	x	x	x	x	x	x
Licensing changes	x	x	x	x	x	x	x
Linux for pSeries			x				
Linux for zSeries			x				
Macintosh OS X Unicode Support for Backup-Archive Client	x	x	x	x	x	x	x
Move Data by Node	x	x	x	x	x	x	x
Product Packaging & Name Changes	x	x	x	x	x	x	x
Server Performance Tuning TXNGROUPMAX	x	x	x	x	x	x	x
Server to Server Export and Import	x	x		x	x		x
Security Firewall Support	x	x	x	x	x	x	x
StorageTek VolSafe Support	x	x	x	x	x		
Support for SCSI Libraries with Multiple Drive Types	x	x	x	x	x		x
Support for Simultaneous Writes to Primary and Copy Storage Pools							x
TapeAlert Device Support	x	x	x	x	x		
Tape Autolabeling	x	x	x	x	x		

Table of Version 5.2.2 TSM Server enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
Disaster Recovery Manager			x				
DVD support					x		
EMC Centera Support	x	x	x	x	x		
IBM 3592 Support	x	x	x	x	x	x	x
IBM Tivoli Storage Manager for Data Retention	x	x	x	x	x	x	x
NDMP Operations	x	x	x	x	x		
Operational Reporting	x	x	x	x	x	x	x
Sony AIT50 and AIT100 WORM Media Support	x	x	x	x	x		

Table of Version 5.3 TSM Server enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
ACSLS Library Support Enhancements	x		x	x	x		
Accurate SAN Device Mapping	x		x	x			
Activity Log Management	x	x	x	x	x	x	x
Check-In and Check-Out Enhancements	x	x	x	x	x		
Collocation by Group	x	x	x	x	x	x	x
Communications Options			x		x		
Database Reorganization	x	x	x	x	x	x	x
Disk-only Backup	x	x	x	x	x	x	x
Enhancements for Server Migration and Reclamation Processes	x	x	x	x	x	x	x
IBM 3592 WORM Support	x	x	x	x	x	x	x
Improved Defaults	x	x	x	x	x	x	x
Increased Block Size for Writing to Tape					x		
LAN-free Environment Configuration	x	x	x	x	x	x	x

Changes	A	H	L	S	W	O	Z
NDMP Operations	x	x	x	x	x		
Net Appliance SnapLock Support	x	x	x	x	x		
New Interface to Manage Servers: Administration Center	x	x	x	x	x	x	x
Server Processing Control in Scripts	x	x	x	x	x	x	x
Simultaneous Write Inheritance Improvements	x	x	x	x	x	x	x
Space Triggers for Mirrored Volumes	x	x	x	x	x	x	x
Storage Agent and Library Sharing Failover	x						
Support for Multiple Tivoli Storage Manager Client Nodes	x	x	x	x	x	x	x
Tivoli Storage Manager Scheduling Flexibility	x	x	x	x	x	x	x

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	A	H	L	S	W	O	Z
Storage Agent for Linux was introduced			x				

Table of Version 5.2 Storage Agent enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
Support for new Linux Platforms zSeries and pSeries			x				

Table of Version 5.2.2 Storage Agent enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
TCPADMINPORT, TCPPORT and defaults	x	x	x	x	x		x
SHOW LANFREE	x	x	x	x	x		x
Storage Agent Compatibility and Support	x	x	x	x	x		x
Changed settings no longer require Storage Agent restart	x	x	x	x	x		x

Table of Version 5.3 Storage Agent enhancements

A=AIX, H=HP-UX, L=Linux, S=Solaris, W=Windows, O=OS/400 PASE, Z=z/OS

Changes	A	H	L	S	W	O	Z
LAN-free Environment Configuration (VALIDATE LANFREE)	x	x	x	x	x		x
Considerations when using LAN free and simultaneous write	x	x	x	x	x		x
Multiple file system support for FILE device types	x	x	x	x	x		x
Multi-session No-Query Restore for LAN-free Path	x	x	x	x	x		x
LANFREETCPServeraddress	x	x	x	x	x		x
Shared Memory Protocol Support			x		x		
Supported Linux Platforms and Kernel Dependencies			x				
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
ACE	Access Control Entries
ACL	Access Control List
AD	Microsoft Active Directory
ADSM	ADSTAR Distributed Storage Manager
AFS	Andrew File System
AIX	Advanced Interactive eXecutive
ANSI	American National Standards Institute
API	Application Programming Interface
APPC	Advanced Program-to-Program Communication
APPN	Advanced Peer-to-Peer Networking
ARPA	Advanced Research Projects Agency
ASCII	American National Standard Code for Information Interchange
ASR	Automated System Recovery
ATM	Asynchronous Transfer Mode
BDC	Backup Domain Controller
BIND	Berkeley Internet Name Domain
BSD	Berkeley Software Distribution
CA	Certification Authorities
CAL	Client Access License
C-SPOC	Cluster single point of control
CDE	Common Desktop Environment
CGI	Common Gateway Interface
CIFS	Common Internet File System
CIM	Common Information Model
CPI-C	Common Programming Interface for Communications
CPU	Central Processing Unit
CSR	Client/server Runtime
DAC	Discretionary Access Controls
DARPA	Defense Advanced Research Projects Agency
DASD	Direct Access Storage Device
DBM	Database Management
DCE	Distributed Computing Environment
DCOM	Distributed Component Object Model
DDE	Dynamic Data Exchange
DDNS	Dynamic Domain Name System
DES	Data Encryption Standard
DFS	Distributed File System
DHCP	Dynamic Host Configuration Protocol
DLC	Data Link Control
DRM	Disaster REcovery Manager
DSA	Directory Service Agent
DNS	Domain Name Systemb
EFS	Encrypting File Systems
EGID	Effective Group Identifier
EMS	Event Management Services
ERP	Enterprise Resources Planning
ERRM	Event Response Resource Manager

ESCON Enterprise System Connection

ESP Encapsulating Security Payload

ESS Enterprise Storage Server

EUID Effective User Identifier

FAT File Allocation Table

FC Fibre Channel

FDDIFEC Fiber Distributed Data Interface

FEC Fast EtherChannel technology

FIFO First In/First Out

FQDN Fully Qualified Domain Name

FSF File Storage Facility

FTP File Transfer Protocol

FtDisk Fault-Tolerant Disk

GC Global Catalog

GDA Global Directory Agent

GDI Graphical Device Interface

GDS Global Directory Service

GID Group Identifier

GL Graphics Library

GUI Graphical User Interface

HA High Availability

HACMP High Availability Cluster Multiprocessing

HAL Hardware Abstraction Layer

HBA Host Bus Adapter

HCL Hardware Compatibility List

HSM Hierarchical Storage Management

HTTP Hypertext Transfer Protocol

IBM International Business Machines Corporation

IDE Integrated Drive Electronics

IDS Intelligent Disk Subsystem

IIS Internet Information Server

I/O Input/Output

IP Internet Protocol

IPC Interprocess Communication

IPL Initial Program Load

IPsec Internet Protocol Security

ISA Industry Standard Architecture

iSCSI SCSI over IP

ISDN Integrated Services Digital Network

ISNO Interface-specific Network Options

ISO International Standards Organization

ISV Independent Software Vendor

ITSO International Technical Support Organization

JBOD Just a Bunch of Disks

JFS Journaled File System

JVM Java Virtual Machine

LAN Local Area Network

LCN Logical Cluster Number

LDAP Lightweight Directory Access Protocol

LFS Logical File System (AIX)

LP Logical Partition

LPC Local Procedure Call

LUN Logical Unit Number

LVCB Logical Volume Control Block

LVDD Logical Volume Device Driver

LVM Logical Volume Manager

MBR Master Boot Record

MDC Meta Data Controller

MDM Multiple Device Manager

MFT Master File Table

MIB Management Information Base

MMC	Microsoft Management Console
MOCL	Managed Object Class Library
MSCS	Microsoft Cluster Server
MSS	Modular Storage Server
MWC	Mirror Write Consistency
NAS	Network Attached Storage
NBC	Network Buffer Cache
NBPI	Number of Bytes per I-node
NDMP	Network Data Management Protocol
NFS	Network File System
NIM	Network Installation Management
NIS	Network Information System
NTFS	NT File System
NVRAM	Non-Volatile Random Access Memory
NetDDE	Network Dynamic Data Exchange
ODBC	Open Database Connectivity
ODM	Object Data Manager
OM	Object Manager
OPAL	IBM Orchestration and Provisioning Automation Library
OS	Operating System
OSF	Open Software Foundation
PAM	Pluggable Authentication Module
PCI	Peripheral Component Interconnect
PCMCIA	Personal Computer Memory Card International Association
PDC	Primary Domain Controller
PDF	Portable Document Format
PFS	Physical File System
PHB	Per Hop Behavior
POSIX	Portable Operating System Interface for Computer Environment
PP	Physical Partition
PReP	PowerPC® Reference Platform
PSM	Persistent Storage Manager
PSN	Program Sector Number
PV	Physical Volume
PVID	Physical Volume Identifier
QoS	Quality of Service
RAID	Redundant Array of Independent Disks
RAS	Remote Access Service
RDBMS	Relational Database Management System
RISC	Reduced Instruction Set Computer
RMC	Resource Monitoring and Control
RMSS	Reduced-Memory System Simulator
ROLTP	Relative OnLine Transaction Processing
ROS	Read-Only Storage
RPC	Remote Procedure Call
RSM	Removable Storage Management
RSVP	Resource Reservation Protocol
SAM	Security Account Manager
SAN	Storage Area Network
SCSI	Small Computer System Interface
SDK	Software Developer's Kit
SFS	SAN File System
SID	Security Identifier
SMB	Server Message Block

SMIT	System Management Interface Tool
SMP	Symmetric Multiprocessor
SMS	Systems Management Server
SNA	Systems Network Architecture
SNMP	Simple Network Management Protocol
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
VPN	Virtual Private Network
VSM	Virtual System Management
W3C	World Wide Web Consortium
WAN	Wide Area Network
WLM	Workload Manager
WWN	World Wide Name
WWW	World Wide Web

Glossary

A

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.

B

Bandwidth A measure of the data transfer rate of a transmission channel.

Bridge Facilitates communication with LANs, SANs, and networks with dissimilar protocols.

C

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.

E

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.

H

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.

M

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.

N

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.

O

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.

P

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.

Z

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
- T*SM 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_Devices_for_AIXHPSUNWIN.html

- Tivoli Support - IBM Tivoli Storage Manager Version Release Information:

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

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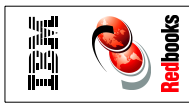

IBM Tivoli Storage Manager Version 5.3 Technical Guide

(0.5” spine)
0.475”<->0.875”
250 <-> 459 pages

IBM Tivoli Storage Manager Version 5.3 Technical Guide

Understand and use the new Administration Center

Learn about enhancements and new functions

Covering Versions 5.1.5, 5.2.x, and 5.3

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.

This book is intended for customers, consultants, IBM Business Partners, and 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.

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