Data Protection for mySAP.com® Technology
Installation & User’s Guide for DB2 UDB

Version 3 Release 3.1
Data Protection for mySAP.com® Technology
Installation & User’s Guide for DB2 UDB

Version 3 Release 3.1
Note!
Before using this information and the product it supports, be sure to read the general information under "Notices" on page ix.

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Preface

Who Should Read This Book

This manual is intended for system programmers and administrators who are responsible for implementing a backup solution in the mySAP.com environment using the Tivoli Storage Manager. It explains the procedures needed to install and customize Data Protection for mySAP.com, the interface between mySAP.com and the Tivoli Storage Manager. The reader should be familiar with mySAP.com and DB2 Universal Database (DB2 UDB) documentation.

Where to Find More Information

For more information about Data Protection for mySAP.com, please refer to the Tivoli Internet home page at http://www.ibm.com/software/tivoli.

Note:
The most up-to-date version of this book is available on the Web at http://www.ibm.com/software/tivoli/library.

Naming Conventions used in this Documentation

In this documentation, Data Protection for mySAP.com technology is usually referred to as Data Protection for mySAP.com or DP for mySAP.com.

Contents of the Data Protection for mySAP.com Package

The Data Protection for mySAP.com package includes this manual and machine readable material on a CD-ROM. See the README file for:

- A table of contents of the package
- Up-to-date news

Supported Platforms

The following platforms are supported:

- AIX 4.3.3 and 5.1
- Windows NT (Intel) 4.0
- Windows 2000
- Solaris 7, 8

Note

Unless otherwise stated, references in this publication to UNIX® apply to all supported UNIX-based systems, and references to Windows® apply to Windows NT® and Windows 2000.
Platform Differences

There are only small differences between the UNIX and Windows versions of Data Protection for mySAP.com. One of these differences is that UNIX uses the path separator "/" compared with "\" for Windows and that the drive letter is specified for Windows. Non-trivial differences between the UNIX and Windows versions of Data Protection for mySAP.com will be mentioned explicitly.
Chapter 1. Introducing Data Protection for mySAP.com

Data Protection for mySAP.com is an intelligent client/server program to manage backing up and restoring mySAP.com DB2 databases using the Tivoli Storage Manager (TSM) (see Chapter 2, “Tivoli Storage Manager Setup”, on page 9).

This chapter gives you an overview and description of the architecture and properties of Data Protection for mySAP.com.

Architecture and Properties of Data Protection for mySAP.com

Data Protection for mySAP.com lets you manage backup storage and processing independently of normal mySAP.com operations. Data Protection for mySAP.com and Tivoli Storage Manager provide reliable, high performance, repeatable backup and restore processes that let system administrators manage large volumes of data more efficiently.

Data Protection for mySAP.com allows system administrators to follow SAP procedures for backup and restore. Other SAP files, for example executables, are backed up using Tivoli Storage Manager standard techniques for file backup and restore such as incremental backup, file filtering, and versioning.

Data Protection for mySAP.com for DB2 UDB backs up and restores data blocks using the DB2 Vendor API as seen in the following figure:
Data Protection for mySAP.com consists of two components:

- **Prole**
  - permanently running background process
  - controls backup/restore operations
  - reads and interprets parameters that are specified in the profile
  - reads/writes internal parameters (e.g., Tivoli Storage Manager password) from/to the configuration file
  - sends backup/restore performance data to the Administration Assistant server.

- **Shared vendor library**
  - shared library
  - reads/transfers data blocks from/to the DB2 Vendor API
  - reads/transfers data from/to the Tivoli Storage Manager API client

Data Protection for mySAP.com for DB2 UDB supports the backup of data blocks.

In the case of a backup (e.g., full backup, incremental backup), DB2 starts a DB2 agent process. This process reads the data (data blocks) to be backed up from the DB2 database and transfers it to the shared vendor library using the DB2 Vendor API. The backup client reads the data blocks and sends them to one or more (of several) Tivoli Storage Manager servers using the Tivoli Storage Manager API client.
Data Protection for mySAP.com optimizes the data throughput for backup and restore in several ways to minimize downtime and the impact on normal system operation:

- It is able to handle multiple backup/restore sessions. Each session reads data from and writes data to storage devices in parallel with (and independently of) each other.
  
  One session can be established per backup storage device.

- It utilizes multiple communication paths to Tivoli Storage Manager servers to eliminate network-induced bottlenecks.

**Note**

When Data Protection for mySAP.com is called to perform a backup or restore, it always uses the Tivoli Storage Manager API `archive` and `retrieve` functions. Data Protection for mySAP.com does not use the Tivoli Storage Manager API `backup` and `restore` functions.

### The Data Protection for mySAP.com Profile

You can customize the way Data Protection for mySAP.com operates with keywords and parameters in a profile that is analyzed by Data Protection for mySAP.com Profile before any Tivoli Storage Manager subcommands are processed. By customizing this profile, you can adapt Data Protection for mySAP.com to your environment's specific needs (see Appendix D, “The Data Protection for mySAP.com Profile”, on page 81).

### The Data Protection for mySAP.com Configuration File

Parameters that Data Protection for mySAP.com modifies are stored in a separate binary configuration file for use in later sessions. In addition to other information, this file contains the Tivoli Storage Manager password in an encrypted form. Be aware that Data Protection for mySAP.com might not be able to run if you change this file manually.

### Parallel Backup and Restore

Data Protection for mySAP.com can do backups and restores of DB2 databases in parallel.

The profile keyword `MAX_SESSIONS` specifies the maximum number of parallel sessions Data Protection for mySAP.com will establish. Each session transfers a set of data blocks to or from the Tivoli Storage Manager server by using the Tivoli Storage Manager API client functions.

**Note**

You should specify as many parallel sessions as there are physical storage devices available at the Tivoli Storage Manager server.
Multiple Management Classes

The Tivoli Storage Manager server manages data by using management classes. For more information, refer to the *Administrator’s Guide for Tivoli Storage Manager* for a detailed description of Tivoli Storage Manager concepts, including management classes.

In order to take full advantage of Data Protection for mySAP.com’s parallel backup and restore capabilities, you should specify one management class for each physical backup device (tape drive). Data Protection for mySAP.com distinguishes between tablespaces (containers) and offline log files, and uses different management classes for these objects. Use the profile keywords `BRBACKUPMGTCLASS` and `BRARCHIVEMGTCLASS` to specify these management classes.

With this feature, Data Protection for mySAP.com can use more than one storage library device at a time.

Multiple DB2 Log File Copies

As a protection against tape defects or to improve availability or disaster recovery, multiple copies of log files can be stored during one BRARCHIVE run on different physical Tivoli Storage Manager volumes. If a log file is not accessible during a restore, Data Protection for mySAP.com will automatically attempt to retrieve the file from another copy.

How many copies are stored depends on the setting of the keyword `REDOLOG_COPIES`. If the keyword is set to 2, for example, two copies will be created.

This feature can only be used when (at least) as many archive management classes are defined as numbers of log copies are specified (keyword `BRARCHIVEMGTCLASS`).

Backup by Version

This function lets you keep a specified number of backups.

**Keep in Mind**

The expiration period for your backups in Tivoli Storage Manager must be long enough so that it does not conflict with this feature in Data Protection for mySAP.com.

Every time a full backup completes successfully, the version count is incremented by 1 and stored in the Data Protection for mySAP.com configuration file. This value is also assigned to the tablespace files and to all subsequent DB2 log file backups. If the number of versions kept in backup storage is larger than the specified maximum number of backup versions (stored in the parameter `MAX_VERSIONS`), the oldest versions are deleted (together with the corresponding tablespace and log files) until only the specified maximum number of most recent versions remain.
Notes

- Partial backups get the same version number as the last successful full backup. When Data Protection for mySAP.com deletes an old full backup, all partial backups with the same version number are also deleted.
- Every database instance needs its own configuration file (see parameter CONFIGURATION_FILE) and a unique BACKUPIDPREFIX.

CAUTION

Tivoli Storage Manager uses the value of the parameter RETVER specified when defining a copy group (see “Policy Definition” on page 12) to give files an expiration date. If you use Data Protection for mySAP.com versioning, you need to bypass this expiration function. If you use the Tivoli Storage Manager expiration function, you need to turn off Data Protection for mySAP.com versioning. Use only one of these methods to control how long you keep backups.

If you use Data Protection for mySAP.com versioning, set the Tivoli Storage Manager parameter RETVER=9999 so that the files are not considered expired and are not deleted by Tivoli Storage Manager.

If you use Tivoli Storage Manager expiration, deactivate Data Protection for mySAP.com versioning by setting MAX_VERSIONS=0.

Alternate/Parallel Backup Paths

Data Protection for mySAP.com lets you define alternate parallel backup paths. Alternate backup paths improve the availability of the backup/restore process, reduce network-induced bottlenecks, and increase backup/restore performance. In order to use this option, the Tivoli Storage Manager server must be accessible under more than one network address. When you set up this option, Data Protection for mySAP.com uses the configured communication paths for data transfer to the Tivoli Storage Manager server. These paths can be used simultaneously to increase data throughput or to ensure that the backup operation can continue when one or more paths are down. You can specify a number of parallel sessions for each path to adjust to different network speeds and to distribute the load over the network.

For each communication path (for example, a Tivoli Storage Manager server network address), you define a set of additional communication parameters (see Appendix C, “Alternate/Parallel Backup Paths and Backup Servers”, on page 73). This client option data is collected under a logical server name that you can choose freely. Under UNIX, it is possible to store all client option data in a single client system option file that is called dsm.sys. Under Windows, you will need to store the client option data for each logical server in separate client option files that have the file names <servername>.opt. For example, if you have two logical Tivoli Storage Manager servers fast and slow, then you need two client option files fast.opt and slow.opt. For Windows, you need an additional client user option file, dsm.opt. All option files must reside in the same directory.

You use the profile to tell Data Protection for mySAP.com about the communication paths to be used in the SERVER statement. Under the keyword
SERVER, specify the logical Tivoli Storage Manager server name. This name establishes the connection between the corresponding sections of the Tivoli Storage Manager client option files and the Data Protection for mySAP.com profile.

See Appendix C, “Alternate/Parallel Backup Paths and Backup Servers”, on page 75 for a description of the SERVER statement. This section also contains profile examples of how to use alternate backup paths.

Alternate/Parallel Backup Servers

You can specify alternate backup servers to increase performance or for disaster recovery purposes. For disaster recovery, the backup data is routed to other Tivoli Storage Manager servers. This function is similar to alternate backup paths, except that now the keyword SERVER refers to physically different Tivoli Storage Manager servers. The backup data is distributed over the configured set of Tivoli Storage Manager servers, however, Data Protection for mySAP.com keeps track of all backups regardless of which server they are stored on. Each server can be accessed again using alternate backup paths.

The USE_AT keyword lets you route backups to specific servers at defined times. You can select the day of the week that any path should be activated.

For profile examples of how to use alternate backup servers, see the respective sections in Appendix C, “Alternate/Parallel Backup Paths and Backup Servers”, on page 75.

Incremental Backup

As of DB2 UDB version 7.2, incremental backups are possible. An incremental backup saves only those blocks within the database, which have been changed since the last full backup.

Incremental backups reduce the total amount of data to be backed up. Depending on the system environment, this may result in decreased backup times. It may lead to a reduced network load and to a reduced need of backup system capacity. Furthermore, this could be of special advantage for large databases which have only a few changes on a daily basis.

Data Protection for mySAP.com supports incremental backups of DB2 databases.

You can find additional information about incremental backup strategies in an SAP environment in your SAP online documentation.

Frontend/Backend Processing

Data Protection for mySAP.com provides frontend and backend processing capabilities. With this feature, a program or command can be called before or after Data Protection for mySAP.com runs. Specify the program or command with the profile keywords FRONTEND and BACKEND.

The frontend program is called before a backup or restore operation starts. The backend program is called after a backup or restore operation has ended.
Reporting

Data Protection for mySAP.com process results are logged in files. For details, refer to Appendix A, “Data Protection for mySAP.com Messages”, on page 53.

Message Logging

Data Protection for mySAP.com can send log messages to a configurable Tivoli Storage Manager server. Possible messages include backup and restore progress information and error messages. Use a LOG_SERVER keyword in the profile to enable this feature.

Furthermore, Data Protection for mySAP.com is able to send log messages to a network management program via SNMP traps. Such messages include backup and restore progress information and error messages. Use an SNMPTRAP keyword in the profile to enable this feature.

Tracing

Data Protection for mySAP.com can write trace information into a file to help analyze problems. You should contact your Data Protection for mySAP.com support before you use this function.

Improving Performance

Data Protection for mySAP.com is multi-threaded. This design makes use of enlarged internal buffers. Disk I/O to a particular block of these buffers can be carried out independently of network I/O to a different block. On SMP machines, these independent parts of the code (threads) run concurrently on different processors.

Data Protection for mySAP.com contains the following additional features:

- RL compression
- user-adjustable block size for sending data to Tivoli Storage Manager
Chapter 2. Tivoli Storage Manager Setup

This chapter gives an overview of the Tivoli Storage Manager and explains the procedures for setting it up for working with Data Protection for mySAP.com in an SAP environment. A typical list of actions that the Tivoli Storage Manager installer or administrator must perform to prepare Tivoli Storage Manager to work in an SAP environment will be explained.

Note
The following steps and procedures are only samples. The actual values in your specific environment may be different.

Tivoli Storage Manager

Tivoli Storage Manager is the core product of the Tivoli Storage Management product set. It provides a solution for distributed data and storage management in an enterprise network environment. Tivoli Storage Manager currently protects and manages data on more than 30 operating platforms, covering mobile, desktop and server systems distributed over the entire world. It is integrated with hundreds of storage devices as well as with LAN, WAN, and SAN infrastructure.

The base function provided by Tivoli Storage Manager and its complementary products includes:

Data Protection
1. *Operational Backup and Restoration of Data*: The backup process creates a copy of the data which protects against operational loss or destruction of file or application information. You can define how often the data is to be backed up (frequency) and how many copies (versions) are to be kept. The restore process places the backup copy of the data into a customer-designated system or workstation.

2. *Disaster Recovery*: This involves all activities for organizing, managing and automating the recovery process after a major loss of IT infrastructure and data across the enterprise. This includes processes for moving data offsite into a secure vault location, for rebuilding IT infrastructure, and for enabling data to be successfully reloaded in an acceptable time frame.

Storage Resource Management
1. *Vital Record Retention Archive and Retrieval*: The archival process creates a copy of a file or a set of files representing an end point of a process for long term storage. Files can remain on the local storage media or can be deleted. The customer controls how long (retention period) an archive copy is to be retained. The retrieval process locates the copies within the archival storage and places them back into a customer-designated system or workstation.

2. *Hierarchical Space Management*: This process provides automatic and transparent movement of operational data from the user system disk space to a central storage repository. If the user accesses this data, it is dynamically and transparently restored to the client storage.

These functions are network based, which means that they are available to the whole network environment. All the functions can be automated to run in a 24x7 environment.
lights-out environment. Administration costs are minimized by centralization of all the management of Tivoli Storage Manager components. The Tivoli Storage Manager supports a wide variety of platforms for mobile, small and large systems, and delivers, together with complementary products, many data management functions such as data protection for file and application data, record retention, space management, and disaster recovery.

You can find additional information about the Tivoli Storage Manager in the respective manuals such as the Administrator’s Reference for Tivoli Storage Manager or the Administrator’s Guide for Tivoli Storage Manager.

Tivoli Storage Manager publications are also available on the Tivoli Storage Manager home page at http://www.ibm.com/software/tivoli/products/storage-mgr

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**Configuration of Tivoli Storage Manager Server**

This section shows the procedure for setting up the Tivoli Storage Manager server. General server configurations will be described first and finally specific server configurations, such as setup of storage devices.

The Tivoli Storage Manager commands presented in this chapter are shown in full for ease of understanding. In the Tivoli Storage Manager command line interface, short cuts or abbreviations for all commands and parameters can be used for convenience. Tivoli Storage Manager also has a Web-browser-based Graphical User Interface (GUI).

**General**

Before starting the installation, some important performance issues should be considered. The careful choice of the server that is to be installed, the network topology, and the use of powerful hardware can improve performance within the system landscape and can avoid performance bottlenecks.

- **Host for Tivoli Storage Manager server.** The Tivoli Storage Manager server should be installed on an exclusive machine. This procedure avoids concurrent processes and disk I/O accessing with other applications. In a single SAP system landscape, a single Tivoli Storage Manager server is sufficient. If you plan to use the Storage Manager to back up/restore other clients as well, you should consider either installing the server software on a large machine or using several Tivoli Storage Manager servers.

- **Network topology.** Network topologies such as Ethernet, Token Ring, FDDI, Fast Ethernet, and ATM all work well with Tivoli Storage Manager. In general, the fastest network topology like FDDI or Fast Ethernet should be used to prevent bottlenecks during backup/restore operations. Tivoli Storage Manager supports multiple network adapters, increasing server throughput by providing multiple connections to the same network or several physically distinct networks with the same server.

- **RS/6000® SP™ environment.** An RS/6000 SP node can be used for a Tivoli Storage Manager server. The use of a High Performance Switch network will improve performance of backup/restore operations on the Tivoli Storage Manager server.

**Prerequisites**

It is assumed that the Tivoli Storage Manager server has already been successfully installed. This means that the following steps have been completed:
- Tivoli Storage Manager server has been installed. For information on the required release and maintenance level, refer to the Data Protection for mySAP.com release notice.
- Recovery log volume has been allocated and initialized.
- Recovery log mirror volume has been allocated and initialized.
- Database volume has been allocated and initialized.
- Database mirror volume has been allocated and initialized.
- Additional labeled volumes for the backup and archive storage pools have been allocated and initialized (disks, tapes or combinations).
- Licenses have been registered.
- The Tivoli Storage Manager server has been started.

For information on installing Tivoli Storage Manager, see the Tivoli Storage Manager Quick Start manual.

**Note**
The latest code fixes for Tivoli Storage Manager can be found at: [ftp://index.storsys.ibm.com/tivoli-storage-management/maintenance](ftp://index.storsys.ibm.com/tivoli-storage-management/maintenance)

### Storage Device Setup

A storage device defines a device class, which will handle one type of media, e.g., tape libraries or jukeboxes. There is a default device class defined for disks called DISK which obviates the need for a redefinition.

For proper storage device setup, check the following items established within the Tivoli Storage Manager server during the installation procedure:

1. Query defined library
   ```shell
   q library
   ```
2. Query defined drives
   ```shell
   q drive
   ```
3. Query defined device class
   ```shell
   q devclass
   ```

### Storage Pool Definition

A storage pool is a named collection of storage volumes that are associated with one device class. Each storage pool represents a collection of volumes that are the same media type. The storage pool setup defines the storage hierarchy for the appropriate environment.

In a mySAP.com environment, there are different kinds of data to be backed up. These are:
- SAP system data
- mySAP.com database data (containers, offline log files)

To separate this data within the Tivoli Storage Manager, you must define appropriate storage pools for each of these data collections. The following section
gives examples of how storage pools within Tivoli Storage Manager can be defined in consideration of the requirements mentioned above.

To define storage pools within the Tivoli Storage Manager server, log on as Tivoli Storage Manager Administrator using the Admin Command Line or the Web Admin and invoke the following commands:

1. Definition of a storage pool for the SAP system data
   
   ```
   define stgpool sap_incr <device_class_name> maxscr=5
   ```

2. Definition of a storage pool for the containers
   
   ```
   define stgpool sap_db <device_class_name> maxscr=20
   ```

3. Definition of a storage pool for the offline log files
   
   ```
   define stgpool sap_log1 <device_class_name> maxscr=3
   ```

   **Note**
   When you associate a library tape device, you have to define the maximum number of scratch volumes (labeled volumes which are empty or contain no valid data) this storage pool will be allowed to use (parameter maxscr). The maximum number of scratch tapes depends on the size of the database, the capacity of the tapes, the number of scratch volumes available and how many versions of the backup you will keep. Replace these values with your estimates.

**Policy Definition**

Tivoli Storage Manager policies are used to specify how files are backed up, archived, migrated from client node storage, and managed in server storage.

A policy definition includes the definition of a policy domain, a policy set, management classes and copy groups. After the definition phase, you need to assign a default policy set and validate and activate it.

For the policy definition, log on as a Tivoli Storage Manager Administrator using the Admin Command Line or the Web Admin and invoke the following commands:

1. Policy domain and policy set definition
   
   ```
   define domain sap_c21
   define policyset sap_c21 p_c21
   ```

2. Management Class definition for file system backups, data files, offline log files and copies of offline log files
   
   ```
   define mgmtclass sap_c21 p_c21 mdefault
   define mgmtclass sap_c21 p_c21 mdb
   define mgmtclass sap_c21 p_c21 mlog1
   define mgmtclass sap_c21 p_c21 mlog2
   ```
If you are planning to use this Tivoli Storage Manager server with multiple SAP systems, it is recommended that you use a set of different management classes for each system.

3. Copy Group definition

```
define copygroup sap_c21 p_c21 mdefault type=backup destination=sap_incr
define copygroup sap_c21 p_c21 mdefault type=archive destination=archivepool
define copygroup sap_c21 p_c21 mdefault type=archive destination=sap_db retver=9999
define copygroup sap_c21 p_c21 mlog1 type=archive destination=sap_log1 retver=9999
define copygroup sap_c21 p_c21 mlog2 type=archive destination=sap_log2 retver=9999
```

Data Protection for mySAP.com uses its own version control mechanism for managing mySAP.com database backups. To do this, Data Protection for mySAP.com backs up all data only to management classes for which an archive copy group has been defined (parameter type set to archive). In addition, to prevent backed up files within Tivoli Storage Manager being deleted because of their expiration date (Tivoli Storage Manager deletes expired files), the copy group parameter retver (specifies the number of days a file is to be kept) should be set to unlimited (9999).

4. Assigning the default management class

```
assign defmgmtclass sap_c21 p_c21 mdefault
```

5. Validating and activating the policy set

```
validate policyset sap_c21 p_c21
activate policyset sap_c21 p_c21
```

Node Definition

The Tivoli Storage Manager server views its registered clients, application clients, host servers, and source servers as nodes that require services and resources from the server.

To register a node within Tivoli Storage Manager, log on as Tivoli Storage Manager administrator using the Admin Command Line or the Web Admin and invoke the following command:

```
register node C21 passwd domain=sap_c21 maxnummp=8
```

Note

If you are using two or more tape drives, you may want to pay special attention to the node parameter maxnummp. It defines the maximum number of mount points that one node can use. The default value is 1. If one node should use more than one mount point, the parameter must be set to the desired number of mount points.
Configuration of Tivoli Storage Manager Clients

After the server configuration, you have to configure the clients that will use the Tivoli Storage Manager server. These include the backup/archive client and the Application Programming Interface (API) client. The Tivoli Storage Manager backup/archive client will be used for file system backups. The API client allows users to enhance existing applications with backup, archive, restore, and retrieve services. An installed and confirmed API client is a prerequisite for Data Protection for mySAP.com.

General

First of all, if a successful installation of Tivoli Storage Manager backup/archive client and API client is to be performed, the clients must be installed on all nodes that will interface with the Tivoli Storage Manager server.

In the context of a mySAP.com system landscape, this means that the Tivoli Storage Manager backup/archive client must be installed on every machine scheduled for a file system backup, for example, mySAP.com application servers and the mySAP.com database server. The Tivoli Storage Manager API client only needs to be installed on the mySAP.com database server machine to enable backup/restore operations of the mySAP.com database in combination with the backup interface program Data Protection for mySAP.com.

Note

When the Tivoli Storage Manager API client is installed on UNIX systems, ensure that there is a softlink /usr/lib/libApiDS.a pointing to the libApiDS.a file in the installation directory (/usr/tivoli/tsm/client/api/bin) of the Tivoli Storage Manager API.

The setup for the Tivoli Storage Manager client is effected in UNIX environments by changing the files dsm.opt and dsm.sys and in Windows environments by changing the file <server_a>.opt (where server_a is a logical server name, see “Tivoli Storage Manager Clients on Windows Systems” on page 15). Subsequently, the include/exclude file must be configured. It defines which files the Tivoli Storage Manager backup/archive client will include or exclude for any backup, archive or hierarchical storage procedure. Examples of an include/exclude file for UNIX can be found in Appendix E, “Sample Tivoli Storage Manager Profiles (UNIX)”, on page 89 and for Windows in Appendix E, “Sample Tivoli Storage Manager Profiles (Windows)”, on page 91.

Tivoli Storage Manager Clients on UNIX Systems

This section serves as a quick guide for configuring the Tivoli Storage Manager. It presents a typical list of actions that the Tivoli Storage Manager installer or administrator must perform to prepare the Tivoli Storage Manager to operate in an SAP environment.

Follow these steps:

1. Install the Tivoli Storage Manager client software on the mySAP.com database server machine.

2. Edit the client system options file dsm.sys and set the following values, as appropriate to your installation:
3. Specify TCPServeraddress 127.0.0.1 or loopback if the server and client are on the same machine. This makes TCP/IP communication a little faster.

4. Specify InclExcl if you want Tivoli Storage Manager to include or exclude the files listed in inclexcl.list. This is optional. You would usually exclude all database files that were processed by the DB2 database backup.

5. If you have tape drives with hardware compression attached to the Tivoli Storage Manager server, you might get better throughput with the hardware compression than you would with the Tivoli Storage Manager client software compression (Compression ON).

6. Edit the client user options file dsm.opt and set the following values:

   LANGUAGE AMENG (this is the default value)
   NUMBERFormat 1 (this is the default value)
   TAPEPROMPT NO
   TIMEFORMAT 1 (this is the default value)

---

**Tivoli Storage Manager Clients on Windows Systems**

This section serves as a quick guide for configuring the Tivoli Storage Manager. It presents a typical list of actions that the Tivoli Storage Manager installer or administrator must perform to prepare Tivoli Storage Manager for operation in a mySAP.com environment.

Follow these steps:

1. Install the Tivoli Storage Manager client software on the mySAP.com database server machine.

2. For each logical Tivoli Storage Manager server you need a corresponding client option file. In the following example, the file name must be server_a.opt since server_a is the logical server name:

   Servername server_a
   TCPPort 1500
   TCPServeraddress xxx.xxx.xxx.xxx
   InclExcl c:\tivoli\tsm\baclient\inclexcl.list
   Compression OFF

   In addition, the environment variables DSM_CONFIG and DSMI_CONFIG must point to the corresponding client options file, e.g., c:\tivoli\tsm\baclient\server_a.opt.

3. Specify TCPServeraddress 127.0.0.1 or loopback if the server and client are on the same machine. This makes TCP/IP communication a little faster.

4. Specify InclExcl if you want Tivoli Storage Manager to include or exclude the files listed in inclexcl.list. This is optional. You would usually exclude all database files that were processed by the DB2 database backup.

5. If you have tape drives with hardware compression attached to the Tivoli Storage Manager server, you might get better throughput with the hardware compression than you would with the Tivoli Storage Manager client software compression (Compression ON).
Chapter 3. Setting Up Data Protection for mySAP.com

Data Protection for mySAP.com must be installed on any system that is to be used as mySAP.com database server. In order to set up Data Protection for mySAP.com, do the following:

1. Make sure that the requirements are met.
   For details, see “Prerequisites for the Installation of Data Protection for mySAP.com”.

2. Get planning information.
   For details, see “Installation Planning for Data Protection for mySAP.com” on page 18.

3. Install Data Protection for mySAP.com.
   For details, see “Installing Data Protection for mySAP.com” on page 18.

   For details, see “Configuring Data Protection for mySAP.com” on page 21.

5. Promote the Data Protection for mySAP.com environment to DB2 UDB by restarting the DB2 instance.

6. Verify the installation.
   For details, see “Verifying the Installation of Data Protection for mySAP.com” on page 23.

Prerequisites for the Installation of Data Protection for mySAP.com

The following products must be installed before you can start setting up Data Protection for mySAP.com:

- DB2 UDB
- SAP R/3 or mySAP.com e-business Solution, based on DB2 UDB
- SAP DB2 UDB Administration Tools
- Tivoli Storage Manager

For product versions supported and maintenance levels required by the current version of Data Protection for mySAP.com, refer to the Release Notice.

For information on the functions, product versions, and maintenance levels that are compatible with your version of SAP R/3 or mySAP.com, consult SAP support, for example via the Online Service System (OSS).

The appropriate modules can be downloaded from the SAP server. Information about this can be found in OSS note 19466.

The latest SAP DB2 UDB Administration Tools must be installed on the mySAP.com database server to be able to do a backup or restore of DB2 offline log files. See OSS notes 141619 and 315352 for additional information.

For information on the installation and configuration of the Tivoli Storage Manager API client, refer to Chapter 2, “Tivoli Storage Manager Setup”, on page 9. For Data Protection for mySAP.com, the Tivoli Storage Manager API Client must be installed on the local system.

TCP/IP must be ready for communication with the Tivoli Storage Manager server.
Installation Planning for Data Protection for mySAP.com

When starting the installation procedure, be prepared to provide the following information. For your convenience, an Installation Planning Sheet is available in Appendix J, "Installation Planning Sheet", on page 99 and in file planning_sheet (UNIX) or planning_sheet.txt (Windows) on the CD-ROM.

- DB2 UDB database SID.
- Path where the DB2 UDB executables reside.
- Tivoli Storage Manager server name. Name or IP address of your TSM server.
- Tivoli Storage Manager node name. TSM node configured on the TSM server named for the backup of the SID denoted above. For details, refer to "Node Definition" on page 13.
- Tivoli Storage Manager management classes for database and log file backups. Management classes configured for the database backup and for the backup of DB2 log files. For details, refer to "Policy Definition" on page 12.
- For Windows only: Path where the Tivoli Storage Manager API (specifically the messages file dscameng.txt) resides (contents of environment variable DSML_DIR). For details, refer to the Tivoli Storage Manager documentation.
- For Windows only: Full path of client option file for Tivoli Storage Manager (contents of environment variable DSML_CONFIG). For details, refer to the Tivoli Storage Manager documentation.
- For Windows only: Path for Tivoli Storage Manager log files (contents of environment variable DSML_LOG). The TSM API will create the file dsierror.log in this path. For details, refer to the Tivoli Storage Manager documentation.
- For Windows only: Installation path for Data Protection for mySAP.com executables.
- Path for Data Protection for mySAP.com configuration files. During the installation, configuration files for Data Protection for mySAP.com will be saved to this path. If old configuration files are found, they are renamed to <filename>.nnn, where nnn is a three-digit decimal number. Note that this path must not contain blanks.
- Administration Assistant server for Data Protection for mySAP.com. Name or IP address of your Administration Assistant server. It is recommended but not required that the Administration Assistant is installed beforehand.
  
  If you do not specify the Administration Assistant server at installation time, it will not be configured. A procedure for specifying the Administration Assistant server after the installation is complete is described in "Specifying an Administration Assistant Server" on page 22.
  
  For more information on the Administration Assistant, refer to Chapter 6, "Administration Assistant for Data Protection for mySAP.com", on page 43.

Installing Data Protection for mySAP.com

Note: If you are going to upgrade from an earlier version of Tivoli Data Protection for R/3 (DB2) or Data Protection for mySAP.com (DB2 UDB), you need to remove the old version before installing the new version. For more information on the deinstallation procedures, refer to "Uninstalling Data Protection for mySAP.com" on page 24.
The Data Protection for mySAP.com program is usually delivered on CD-ROMs. Refer to the file README.txt in the root path for information on where to find documents on your CD-ROM. You may also download the latest version from the IBM Tivoli homepage at [http://www.ibm.com/software/tivoli](http://www.ibm.com/software/tivoli) However, this may only be used for upgrading your version of Data Protection for mySAP.com. An initial installation must always be done from CD-ROM.

### Installing Data Protection for mySAP.com on UNIX (AIX, Solaris)

Data Protection for mySAP.com for UNIX systems is delivered as a single executable file named

```
install_tdpr3_db2_<operating system>_<32bit|64bit>.bin
```

where

- `<operating system>` is `aix43` for AIX 4.3, or `aix51` for AIX 5.1, or `solaris`.

To install Data Protection for mySAP.com on a UNIX system, do the following:

1. Read the Release Notice and the README file provided with Data Protection for mySAP.com.
2. Log in as root user on the mySAP.com database server machine.
3. Make sure that the DISPLAY variable is set correctly as the installation procedure requires a graphical X-Window.
4. Invoke the executable mentioned above and follow the instructions of the installation dialog.
5. Check the summary at the end of the installation dialog. In the summary, among other information, you find the installation path of Data Protection for mySAP.com. Installation results are also logged in the installation log named `log.txt` located in the installation path.

During installation, the following modifications are done to your system:

- `/etc/inittab`: An entry is created to start the daemon "prole" automatically.
- `/etc/services`: An entry is created for the service `tdpr3db2` (32-bit version) or `tdpr3db264` (64-bit version).
- DB2 profile registry variable `DB2_VENDOR_INI` points to a file containing Data Protection for mySAP.com environment settings for DB2.
- Environment variable `DB2_VENDOR_LIB` points to the path where the executables of Data Protection for mySAP.com reside.
- Environment variable `XINT_PROFILE` points to the Data Protection for mySAP.com profile located in the path for configuration files specified during installation. The file name is `init<SID>.utl` where `<SID>` is the DB2 UDB database SID specified during installation.
- Environment variable `TDP_DIR` points to the path where Data Protection for mySAP.com creates its own process logs. Initially, this path is set to `<configuration file path>/tdplog` where `<configuration file path>` is the path for Data Protection for mySAP.com configuration files specified during installation.

After the installation, the following files are available on your system:

- In the installation path of Data Protection for mySAP.com:
  - README
RELNOTE, the current release notice
TIPHINTS
On AIX: libtdpdb2.a or libtdpdb264.a
On Solaris: libtdpdb2.so or libtdpdb264.so
prole
backom
tdp passwd
createinfo
initSID.bki
initSID.utl
Various sample files
Only after installation from CD-ROM: agent.lic

• In the path of the Data Protection for mySAP.com configuration files: init<SID>.utl, where <SID> is replaced by the DB2 UDB database SID provided during installation
• init<SID>.bki, where <SID> is replaced by the DB2 UDB database SID provided during installation
vendor.env
Only after installation from CD-ROM: agent.lic

Installing Data Protection for mySAP.com on Windows
Data Protection for mySAP.com for Windows is delivered as a single file named install_tdpr3_db2_win_32bit.exe.

To install Data Protection for mySAP.com on a Windows system, do the following:
1. Read the Release Notice and the README file provided with Data Protection for mySAP.com
2. Log in as user with administrator authority on the mySAP.com database server machine.
3. Invoke the executable mentioned above and follow the instructions of the installation dialog.
4. Check the summary at the end of the installation dialog. In the summary, among other information, you find the installation path of Data Protection for mySAP.com. Installation results are also logged in the installation log named log.txt located in the installation path.

During installation, the following modifications are done to your system:
• The prole service is installed and started.
• %windir%\system32\drivers\etc\services: An entry is created for the service tdpr3db2.
• Optionally, the environment variables DSMI_DIR, DSMI_CONFIG, and DSMI_LOG are modified.
• DB2 profile registry variable DB2_VENDOR_INI points to a file containing Data Protection for mySAP.com environment settings for DB2.
• Environment variable DB2_VENDOR_LIB points to the path where the executables of Data Protection for mySAP.com reside.
• Environment variable XINT_PROFILE points to the Data Protection for mySAP.com profile located in the path for configuration files specified during installation. The file name is init<SID>.utl where <SID> is the DB2 UDB database SID specified during installation.
• Environment variable TDP_DIR points to the path where Data Protection for mySAP.com creates its own process logs. Initially, this path is set to
<configuration file path>\tdplog where <configuration file path> is the path for Data Protection for mySAP.com configuration files specified during installation.

After the installation, the following files are available on your system:

- In the installation path of Data Protection for mySAP.com:
  - README.txt
  - RELNOTE.txt, the current release notice
  - TIPHINTS.txt
  - tdpdb2.dll
  - prole.exe
  - backom.exe
  - tdp passwd.exe
  - createinfo.exe
  - initSID.bki
  - initSID.utl
  - Various sample files
  - Only after installation from CD-ROM: agent.lic

- In the path of the Data Protection for mySAP.com configuration files:
  - init<SID>.utl, where <SID> is replaced by the DB2 UDB database SID provided during installation
  - init<SID>.bki, where <SID> is replaced by the DB2 UDB database SID provided during installation
  - vendor.env
  - Only after installation from CD-ROM: agent.lic

---

### Configuring Data Protection for mySAP.com

#### Initial Configuration

After successfully completing the installation dialog for Data Protection for mySAP.com, you need to configure the Tivoli Storage Manager password for the TSM server and node specified during installation. For details, refer to "Password Handling".

The initial customization done during installation should be sufficient for verifying the installation.

#### Password Handling

Before you can start using Data Protection for mySAP.com, you need to define which password handling method you want to use. (For a discussion of the options, see Appendix B, “Password Handling”, on page 71.) You can choose between manual password handling and automatic password handling.

If you want to use manual password handling, you must provide the password needed for a client connection to Tivoli Storage Manager that was specified when the node ID was initially registered within Tivoli Storage Manager (see "Node Definition" on page 13). The password is requested initially and again each time it expires for this node within Tivoli Storage Manager.

Normally, you are prompted for the client password every time Data Protection for mySAP.com starts a Tivoli Storage Manager session. This can be avoided if the client password is stored in encrypted form in the Data Protection for mySAP.com configuration file (init<SID>.bki). This can be done with the following command:
Data Protection for mySAP.com prompts for all required passwords that were set for the appropriate Tivoli Storage Manager (this depends on how many Tivoli Storage Manager servers were declared in the Data Protection for mySAP.com profile) and checks whether the passwords are valid. If a connection between Data Protection for mySAP.com and Tivoli Storage Manager is to be established, Data Protection for mySAP.com reads the password from the configuration file and uses it for registration on the Tivoli Storage Manager server.

If you are using automatic password handling, you need to:
1. update the password on the Tivoli Storage Manager server
2. log on once using the above password function on the client node

When the password expires, a new password will be generated automatically.

Depending on the password handling method you want to use, you have to make the following settings on the Tivoli Storage Manager and on the Data Protection for mySAP.com side:

Table 1. Required Settings for Password Handling

<table>
<thead>
<tr>
<th>Manual Password Handling</th>
<th>Automatic Password Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tivoli Storage Manager client options file settings</td>
<td>PASSWORDACCESS prompt</td>
</tr>
<tr>
<td>Data Protection for mySAP.com profile settings</td>
<td>PASSWORDREQUIRED yes</td>
</tr>
</tbody>
</table>

Customizing the Data Protection for mySAP.com Profile

After successfully completing the installation procedure for Data Protection for mySAP.com, an initial setup is done in the profile pointed to by environment variable XINT_PROFILE that should enable you to verify the installation.

You may modify any profile settings according to your needs. A detailed description of all possible profile keywords can be found in Appendix D, “The Data Protection for mySAP.com Profile”, on page 81.

Specifying another Tivoli Storage Manager Server

To add a new Tivoli Storage Manager server to your configuration, you need to perform the following steps:
1. Add a new server statement to your Data Protection for mySAP.com profile.
2. Do the initial configuration (tdppasswd) again (see “Initial Configuration” on page 21).

Specifying an Administration Assistant Server

If you need to specify a new Administration Assistant Server, perform the steps described below.

Specifying an Administration Assistant Server on UNIX (AIX, Solaris)
1. Find the entry for daemon prole in /etc/inittab. Modify the entry to read:
   `prole -p <tdpr3db2> | tdpr3db264> <AA server name> <port>`
2. Make sure that Data Protection for mySAP.com is not running and kill the prole daemon. The prole daemon will be restarted automatically with the new parameters.

Specifying an Administration Assistant Server on Windows

From a command prompt, issue

prole -update <AA server name> <port>

where
<AA server name> is the name or IP address of the Administration Assistant server and
<port> is the port that the Administration Assistant is listening to, the default is 5126.

Changing the Data Protection for mySAP.com Environment

- In order to select a different set of Data Protection for mySAP.com environment settings, modify the DB2 profile registry variable DB2_VENDOR_INI to denote a file containing the new settings:

  db2set DB2_VENDOR_INI=<new vendor environment file>

  where <new vendor environment file> is the full path of the new file containing Data Protection for mySAP.com environment settings for DB2. Make sure that the environment settings of your system match the settings in this file.

- In order to select a different Data Protection for mySAP.com profile, modify environment variable XINT_PROFILE to denote the new profile. The variable needs to be modified both in the environment and in the file pointed to by environment variable DB2_VENDOR_INI.

- In order to change the path for Data Protection for mySAP.com process log files, modify environment variable TDP_DIR. The variable needs to be modified both in the environment and in the file pointed to by environment variable DB2_VENDOR_INI.

  Note: Any changes to the environment must be promoted to DB2 UDB by restarting the DB2 instance.

Promoting Data Protection for mySAP.com Vendor Environment Changes to DB2 UDB

In order to promote any environment changes to DB2 UDB, the DB2 instance must be restarted.

Verifying the Installation of Data Protection for mySAP.com

In order to verify the installation of Data Protection for mySAP.com, start a full database backup and restore it afterwards. For usage examples, refer to “Using Data Protection for mySAP.com” on page 24.
Upgrading Data Protection for mySAP.com

In order to upgrade Data Protection for mySAP.com from an earlier version of Tivoli Data Protection for R/3 or Data Protection for mySAP.com, do the following:

1. **Uninstall the old version.** For the unistallation procedure, see "Uninstalling Data Protection for mySAP.com”.

2. **Set up the current version.** For the setup procedure, see Chapter 3, “Setting Up Data Protection for mySAP.com”, on page 17.

Uninstalling Data Protection for mySAP.com

Uninstalling Data Protection for mySAP.com removes the software from your system; however, your configuration files are retained.

**Uninstalling Data Protection for mySAP.com from UNIX (AIX, Solaris)**

To uninstall Data Protection for mySAP.com, perform the following steps:

1. Log in as root user.
2. Make sure that the DISPLAY variable is set correctly as the uninstallation procedure requires a graphical X-Window.
3. Invoke the executable
   
   `<installation path>/_uninst/uninstaller.bin`

   where `<installation path>` is the installation path documented in the summary at the end of the installation dialog, and follow the instructions of the uninstallation dialog.

**Uninstalling Data Protection for mySAP.com from Windows**

To uninstall Data Protection for mySAP.com, perform the following steps:

1. Log on as user with administrator authority.
2. Ensure that Data Protection for mySAP.com is not running.
3. Select `Start → Settings → Control` panel.
4. Click `Add/Remove Programs`.
5. Select `Data Protection for mySAP.com` and click `Remove`.
   
   Follow the instructions of the uninstallation procedure.

Using Data Protection for mySAP.com

The following examples show how you can start DB2 database/tablespace backups or restores from the command line using the DB2 CLP.

To start a DB2 backup/restore with Data Protection for mySAP.com, log on as user `db2<SID>` or `<SID>adm`. In the following examples, the variable `<shared library>` stands for the full path of the Data Protection for mySAP.com shared library (UNIX) or DLL (Windows).

DB2 UDB database/tablespace backups can be done as follows:

- **full offline backup**
  
  `db2 backup db <dbname> load <shared library>`

- **full online backup** (database parameter LOGRETAIN has to be activated)
db2 backup db <dbname> online load <shared library>

- online tablespace backup (database parameter LOGRETAIN has to be activated)
  db2 backup db <dbname> online tablespace (tablespace_name#1, ...) 
  load <shared library>

**Note**
Every successful backup run generates a timestamp that is needed for later restore operations. These timestamps will be written to the DB2 Recovery History File (RHF), which can be queried with DB2 UDB commands. If no timestamp is specified in a restore command, the latest backup image found on Tivoli Storage Manager will be restored.

DB2 UDB database/tablespace restores can be done as follows:

- **full restore**
  db2 restore db <dbname> load <shared library> taken at <timestamp>

- **tablespace restore**
  db2 restore db <dbname> tablespace (tablespace_name#1, ...) online 
  load <shared library> taken at <timestamp>

- **Recovery History File restore**
  db2 restore db <dbname> history file online load <shared library>

For backing up the DB2 offline log files, you should use the program BRARCHIVE, which is part of the SAP DB2 UDB Administration Tools package.

```sh
brarchive -s -d adsm -vndlib <shared library> -out
```

For a detailed description of the BRARCHIVE functionality, refer to the *Database Administration Guide*, which is included in your mySAP.com documentation.

To restore DB2 offline log files for a subsequent recovery, you should use the program BRRESTORE, which is part of the SAP DB2 UDB Administration Tools package. Of course, only those offline log files that were backed up with BRARCHIVE (see above) can be restored with BRRESTORE.

```sh
brrestore -a -d adsm -vndlib <shared library> -out
```

For a detailed description of the BRRESTORE functionality, refer to the *Database Administration Guide*, which is included in your mySAP.com documentation.

Any Data Protection for mySAP.com process results can be checked by analyzing the Data Protection for mySAP.com log files. These log files may contain success, warning, and error messages. For details, refer to Appendix A, “Data Protection for mySAP.com Messages”, on page 53.
Chapter 4. Backup Strategy and Backup Automation

This section describes how to define an appropriate backup strategy for your mySAP.com system. It is intended as a supplement to your mySAP.com, DB2 UDB, and Tivoli Storage Manager documentation.

There are several requirements that your strategy must meet. The most important factors you need to consider include:

- The types of events you wish to protect your mySAP.com system against
- How quickly you need to be able to return to normal operation after a failure
- The intervals and times of day during which backups can be performed
- The events and points in time you need to be able to recover, depending on the type of outage

Data Protection for mySAP.com lets you backup DB2 UDB databases using the DB2 Vendor API directly to Tivoli Storage Manager storage. However, these backups are only backups of the database or the offline log files.

Hence, to protect your complete system against failures affecting the database management software and other mySAP.com or operating system data, you should use standard Tivoli Storage Manager commands or the Tivoli Storage Manager graphical user interface (GUI) to additionally backup this system data.

To even be prepared for recoveries from severe disasters (such as fire or water damage), the procedures described below must become an integral part of your overall disaster recovery plan.

Planning a Backup Strategy for Your DB2 UDB Database

In order to be able to recover from:

- user errors
- statement failures
- transaction failures
- media failures

that could affect your DB2 UDB database, save the DB2 database objects

- configuration files
- container(s)
- offline log files

as shown in the following figure on a regular basis:
During a backup, a DB2 backup process creates backup images that contain both the database data (DB2 container) and DB2 configuration files (for example, Recovery History File, Log Control File).

Offline log files will be backed up from the log_archive directory with the SAP tool BRARCHIVE. In contrast to the offline log files, the online log files are not backed up by DB2 backup or BRARCHIVE. Filled or closed online log files are immediately copied from the log_dir directory by the DB2 logging user exit to the log_archive directory (if configured) and can be backed up at this point in time using BRARCHIVE or directly by the DB2 logging user exit to the Tivoli Storage Manager server. For a detailed description of the DB2 logging user exit functionality, refer to the Database Administration Guide in your mySAP.com documentation.

DB2 database backups are performed under control of the DB2 instance. Because of this architecture, the DB2 backup utility will only read the contents of the objects (tablespace containers, configuration files), as shown in the following figure, that need to be backed up (rather than backing up files at the operating system level):
Both the contents of the container(s) for the specified tablespace(s) and the configuration information (for example, location of containers, size, database configuration values) are read or written by one or more DB2 processes. They are sent to or received from Data Protection for mySAP.com as data blocks. Data Protection for mySAP.com sends them to or receives them from the Tivoli Storage Manager.

DB2 and Tivoli Storage Manager provide APIs for implementing vendor products for backing up and restoring database data.

Each DB2 backup image will be identified by a unique timestamp. A corresponding entry is logged into the Recovery History File of DB2.

Offline log files are crucial in case of a restore and subsequent roll forward recovery. Therefore, you should back up these files on a regular basis. Ensure that the database parameters LOGRETAIN and USEREXIT are activated to enable DB2 roll forward recovery.

DB2 log files can have four different states during their life cycle as shown in Figure 4 on page 30.
The log file is currently being used by DB2 to log transactions.

The log file is no longer being used, but it contains transactions with data pages that have not yet been written from the buffer pool to disk. It will be needed by DB2 in case of a crash recovery. Nevertheless, the DB2 logging user exit is called by DB2 (if configured) to copy a filled online log file to the log_archive directory. Do not use operating system commands for copying online log files!

The log file is no longer being used by DB2 and does not contain transactions with unwritten data pages. It is not crucial for a crash recovery. It is possible to archive these log files to external storage.

BRARCHIVE has successfully archived offline retained log files to an external storage medium, for example Tivoli Storage Manager or a tape device.

Planning a Backup Strategy for the Operating System

In order to be protected against a complete loss of the operating system, it is imperative that after:

- the installation of the operating system
- updates/upgrades of the operating system

appropriate system backups are made with the operating system dependent utilities, e.g. mksysb for AIX.

This will allow you to start your system from the backup medium. Base backups should include a configured TCP/IP environment as well as the Tivoli Storage Manager client including the API in order to be able to restore all user dependent data.
Planning a Backup Strategy for mySAP.com System Data

In addition to the backup operations performed with DB2 backup and BRARCHIVE, you may want to protect your system against the loss of mySAP.com system data, user data, or even operating system data that is not stored with DB2 backup or BRARCHIVE. You can use the incremental backup capabilities of the Tivoli Storage Manager backup/archive client to do this.

The Tivoli Storage Manager incremental backup function lets you define an include/exclude list of files that is applied automatically during incremental backup operations. This include/exclude list should be used to exclude data already stored using Data Protection for mySAP.com. This would be all database relevant data, such as containers and offline log files. For further information about include/exclude lists, see your Tivoli Storage Manager manuals, *Using the Backup-Archive Clients*. Examples of include/exclude lists for UNIX can be found in Appendix E, “Sample Tivoli Storage Manager Profiles (UNIX)”, on page 89 and for Windows in Appendix F, “Sample Tivoli Storage Manager Profiles (Windows)”, on page 91.

The information saved with the DB2 backup and BRARCHIVE utilities is usually located in the following file systems or directories:

**UNIX**

/db2/SID/sapdata1/
/db2/SID/sapdata2/
/db2/SID/sapdata3/
/db2/SID/sapdata4/
/db2/SID/sapdata5/
/db2/SID/sapdata6/
/db2/SID/log_archive/SID/

**Windows**

<drive>:\db2\SID\sapdata1\  
<drive>:\db2\SID\sapdata2\  
<drive>:\db2\SID\sapdata3\  
<drive>:\db2\SID\sapdata4\  
<drive>:\db2\SID\sapdata5\  
<drive>:\db2\SID\sapdata6\  
<drive>:\db2\SID\log_archive\SID\

Add these directories to the list of paths to be excluded in the include/exclude list of your Tivoli Storage Manager backup/archive client. This will prevent you from saving the database data twice.

**Backup Automation**

To ensure that all your data will be backed up regularly at a certain time, it is recommended that you schedule automated backup and archive operations.

There are several products that can be used to set up a schedule, for example:

- SAP scheduler (CCMS)
- Tivoli Storage Manager scheduler
- UNIX crontab / Windows scheduler
These schedulers are explained below.

The scope of schedule control of the Tivoli Storage Manager scheduler is at an enterprise level, while the SAP scheduler or the UNIX crontab can only be used to set up schedules for the machines on which the mySAP.com database is installed.

**SAP Scheduler**

Within mySAP.com, the Computer Center Management System (CCMS) provides a scheduler for database administration and backup planning. The scheduler can be started from the SAPGUI command line using transaction code db13 or with the SAPGUI menu functions (Tools -> CCMS -> DB administration -> DBA scheduling).

**Tivoli Storage Manager Scheduler**

The Tivoli Storage Manager also provides functions for automating client operations by defining a new schedule or updating an existing schedule.

Schedule definition work can be done quickly using the GUI based Tivoli Storage Manager Web administrative client.

When a schedule is defined, it will be assigned to a specific policy domain (more than one schedule for each policy domain can be defined). For this purpose, the mySAP.com database client requires a schedule that can execute command files. The command files (for example shell scripts on UNIX) contain sequences of commands that are run at a scheduled start date and time.

Information on how to define Tivoli Storage Manager schedules can be found in the *Tivoli Storage Manager Administrator’s Reference* manual.

**UNIX crontab / Windows Scheduler**

Another possibility of backup automation is offered by the *cron jobs* for UNIX systems or *schedule services* for Windows.

UNIX cron jobs can be scheduled with the so-called `crontab` command, which invokes an editing session that allows you to create a crontab file. The cron jobs and the appropriate times are defined within the crontab. The crontab can be customized with the command:

```
crontab -e
```

For example, you want a cron job to start a shell script `backup.ksh` (the content of `backup.ksh` can be found in Appendix H, “Elements of Backup Schedules (UNIX)” on page 95) from Monday through Friday at 11:30 p.m. which will use DB2 backup to save the mySAP.com database. In this case, the entry in the crontab to start the script will be as follows:

```
30 23 * * 1,2,3,4,5 /usr/bin/su - db2<SID> -c "/db2/SID/sapscripts/backup.ksh"
```

To start automated backup jobs on Windows systems, the schedule service must be running. You can start this service with the command:

```
net start schedule
```
If the schedule service is running, jobs can be scheduled with the `at` command which can be used to invoke the batch file `backup.cmd` (the content of `backup.cmd` can be found in Appendix I, “Elements of Backup Schedules (Windows)”, on page 97). If you want to run this every Friday at 8:00 p.m., the following command must be invoked:

```
    at 20:00 /every:f cmd /c <drive>:\SAP\db2\SID\sapscripts\backup.cmd
```
Backup objects, such as database or tablespace backups and DB2 log files, can be managed with the Data Protection for mySAP.com Backup Object Manager.

This utility allows you to:
- find backup objects in TSM,
- check the properties of the backup objects in TSM,
- remove any backup object from TSM,
- restore database and tablespace backups to the corresponding database,
- retrieve files from TSM and restore them to the file system.

The Backup Object Manager works with different kinds of data objects, that is, database backups, DB2 log files, and "raw files" that may comprise any files of the file system. The tasks that can be performed with the Backup Object Manager are processed in different ways:
- Requests to display or delete any data are answered by accessing the TSM server directly, thus working with the data actually available on TSM.
- Requests to restore DB2 log files and "raw files" are also processed via the TSM client.
- Requests to restore any DB2 backups are routed to the DB2 UDB agent. The DB2 UDB agent employs the Data Protection for mySAP.com shared vendor library.
The Backup Object Manager can be used as soon as Data Protection for mySAP.com is installed and set up. No additional installation and setup steps are required, because the Backup Object Manager utilizes the settings in the Data Protection for mySAP.com profile and configuration file (see Appendix D, “The Data Protection for mySAP.com Profile”, on page 81) and the settings of the environment variables XINT_PROFILE, TDP_DIR, and DB2_VENDOR_LIB (refer to “Installing Data Protection for mySAP.com” on page 18).

Backup Object Manager Setup

The Backup Object Manager can be used as soon as Data Protection for mySAP.com is installed and set up. No additional installation and setup steps are required, because the Backup Object Manager utilizes the settings in the Data Protection for mySAP.com profile and configuration file (see Appendix D, “The Data Protection for mySAP.com Profile”, on page 81) and the settings of the environment variables XINT_PROFILE, TDP_DIR, and DB2_VENDOR_LIB (refer to “Installing Data Protection for mySAP.com” on page 18).

Managing Backup Objects

The syntax of the Backup Object Manager is as follows:

```
backom [-h | -?] displays the syntax help.

backom -c command [ command options ]
where command is q_all | q_db | q_ts | q_log | q_raw
     | r_db | r_ts | r_ts_online | r_h_file | r_log | r_raw
     | d_db | d_ts | d_log | d_raw

where 'command options' = command option [command options]
and 'command option' is:
- i <DB2 instance>
- a <DB2 alias name>
- n <DB2 node number>
- u <userid>
- p <password>
```
Backup Object Manager Commands

There are three types of Backup Object Manager commands:
- Query Commands
- Restore Commands
- Delete Commands

The commands and their syntax are described in detail in the following section:

Query Commands

The query commands list backup objects that were sent to TSM by Data Protection for mySAP.com. The objects to be displayed can be filtered by using appropriate command options (see also "Backup Object Manager Command Options" on page 39).

- q_all
  Lists all backup objects related to DB2 (database or tablespace backups and DB2 log file backups).
  Required command options: None.
  Optional command options: -i <instance> -a <database alias> -n <node number> -t <timestamp | time range> -l <log number | log number range> -e <execution profile> -m <output mode> -v

- q_db
  Lists database backups.
  Required command options: None.
  Optional command options: -i <instance> -a <database alias> -n <node number> -t <timestamp | time range> -e <execution profile> -m <output mode> -v

- q_ts
  Lists tables space backups.
  Required command options: None.
  Optional command options: -i <instance> -a <database alias> -n <node number> -t <timestamp | time range> -e <execution profile> -m <output mode> -v

- q_log
  Lists DB2 log file backups.
  Required command options: None.
  Optional command options: -a <database alias> -n <node number> -t <timestamp | time range> -l <log number | log number range> -e <execution profile> -m <output mode> -v

- q_raw
  Lists backup objects available on TSM (database or tablespace backups, DB2 log file backups, and file backups).
  Required command options: None.
  Optional command options: -f <file name> -e <execution profile> -m <output mode> -v

Restore Commands

With the Backup Object Manager restore commands, you can restore any backup object that was created by Data Protection for mySAP.com. (For a detailed description of the command options, refer to "Backup Object Manager Command Options" on page 39).
• r_db
Restores the database denoted by the command options.
Required command options: -a <database alias>
Optional command options: -n <node number> -u <userid> -p <password> -t <timestamp> -e <execution profile> -x -v

• r_ts
Restores the tablespaces denoted by the command options. The table spaces are restored offline.
Required command options: -a <database alias>
Optional command options: -n <node number> -u <userid> -p <password> -t <timestamp> -e <execution profile> -x -v

• r_ts_online
Restores the tablespaces denoted by the command options. The table spaces are restored while the database stays online.
Required command options: -a <database alias>
Optional command options: -n <node number> -t <timestamp> -u <userid> -p <password> -e <execution profile> -x -v

• r_h_file
Restores the DB2 Recovery History File of the database denoted by the command options.
Required command options: -a <database alias>
Optional command options: -n <node number> -t <timestamp> -u <userid> -p <password> -e <execution profile> -x -v

• r_log
Retrieves the DB2 log files denoted by the command options.
Required command options: -a <database alias>
-l <log number | log number range> -d <destination directory>
Optional command options: -n <node number> -t <timestamp | time range> -e <execution profile> -x -v

• r_raw
Retrieves the file(s) specified by command option -f to the path specified by command option -d.
Required command options: -f <file name> -d <destination directory>
Optional command options: -e <execution profile> -x -v

Delete Commands
The Backup Object Manager delete commands remove backup objects from TSM that were sent to TSM by Data Protection for mySAP.com. (For a detailed description of the command options, refer to "Backup Object Manager Command Options" on page 39.)

• d_db
Deletes the database backup(s) specified by the command options from TSM.
Required command options: -a <database alias> -t <timestamp | time range>
Optional command options: -i <instance> -n <node number> -e <execution profile> -x -v

• d_ts
Deletes the tablespace backup(s) specified by the command options from TSM.
Required command options: -a <database alias> -t <timestamp | time range>
Optional command options: -i <instance> -n <node number> -e <execution profile> -x -v

• d_log
Deletes the DB2 log file backup(s) specified by the command options from TSM.
Required command options: -a <database alias>
Optional command options: -n <node number> -t <timestamp | time range>
-e <execution profile> -x -v

```
- d_raw
  Deletes the file(s) specified by command option -f from TSM.
  Required command options: -f <file name>
  Optional command options: -e <execution profile> -x -v
```

**Backup Object Manager Command Options**

The following options may be specified together with Backup Object Manager commands:

- `i <DB2 instance>`
  Used in query commands to limit the database or tablespace updates to be displayed to a specific DB2 instance.
- `a <alias name>`
  Denotes the database alias name that was used to perform the backup.
- `n <node number>`
  Denotes the DB2 node number.
  If it is not specified, node NODE0000 is assumed.
- `p <password>`
  The password of the user ID specified in option -u.
- `u <userid>`
  Denotes the user ID used for restoring a DB2 database, tablespace, or recovery history file if it is different from the current login user ID.
- `t <timestamp | time range>`
  where time range = <timestamp1-timestamp2>
  Denotes the time when a database backup or tablespace backup was created.
  This timestamp matches the timestamp listed in the DB2 Recovery History File.
  It consists of 14 decimal digits and has the format: yyyyymmddhhmmss
  where
  yyyy is the year
  mm is the month of the year, 01 through 12
  dd is the day of the month, 01 through 31
  hh is the hour of the day, 00 through 23
  mm is the minute of the hour, 00 through 59
  ss is the second of the minute, 00 through 59.
  For restore commands, an exact timestamp must be given. If a timestamp is not specified for a restore, the newest object is retrieved from TSM.
  For query and delete commands, a time range can be specified, or the timestamp might contain wild card characters. The following wild card characters are accepted:
  ? denotes any single digit
  * denotes any number of any digits
- `l <log number | log number range>`
  where
  <log number range> = <log number 1><log number 2>
  Denotes the log serial number(s) of DB2 log file(s). DB2 log numbers can be specified either in the format Snnnnnnn.log (DB2 log file name), where nnnnnnn is a string of 7 decimal digits, or in the format mmmmmmmm, where mmmmmmmm is a string of up to 7 decimal digits denoting the log serial number.
The following wild card characters are accepted:
? denotes any single character
* denotes any number of any characters

- **-f <file name>**
  Denotes the name of a file in the file system. The following wild card characters are accepted:
? denotes any single character
* denotes any number of any characters

- **-d <destination directory>**
  Denotes the destination path for restoring a DB2 log file or a file to the file system.

- **-e <execution profile>**
  Denotes the complete path of the Data Protection for mySAP.com profile to be used with the Backup Object Manager.
  Overrides the profile name set in environment variable XINT_PROFILE.

- **-m <output mode>**
  where <output mode> = short | normal | detailed
  Denotes the detail of information requested with a query command. The default is "short" for information related to DB2 log files, "normal" for all other kinds of information.

  If you need to override the default values generally, you may set environment variables FULL_OUTPUT (for information on database backups), TABLESPACE_OUTPUT (for information on tablespace backups) and LOG_OUTPUT (for information on DB2 log file backups) to the values desired.

- **-x**
  If specified, this option suppresses all confirmation requests. Otherwise, confirmation requests will be issued for restore commands that would overwrite existing data, and for delete requests.

- **-v**
  If set, all log messages will also be displayed on STDOUT.

### Examples

The following list contains examples of certain tasks and shows which commands can be used to perform them:

- To create a list of all backup objects sent to TSM by Data Protection for mySAP.com:

  ```
  backom -c q_all
  ```

- To create a list of all DB2 log files for database SAMPLE with a log number greater than 123 and created in November 2002, with normal output detail level:

  ```
  backom -c q_log -a SAMPLE -l 124-9999999 -t 200211* -m normal
  backom -c q_log -a SAMPLE -l 50000124.log-S9999999.log -t 200211* -m normal
  ```

- To create a list of all tablespace backups for database SAMPLE that were created in November 2002 between 4 p.m. and 5 p.m.:

  ```
  backom -c q_ts -a SAMPLE -t 200211??16*
  ```

- To restore a tablespace of database SAMPLE with the tablespace backup created on November 27, 2002, at 6:32:15 p.m.:

  ```
  backom -c r_ts -a SAMPLE -t 20021127183215
  ```
To restore database SAMPLE with the latest backup:

```
backom -c r_db -a SAMPLE
```

To delete all DB2 log files for database SAMPLE that were created before June 2002:

```
backom -c d_log -a SAMPLE -t 1900*-20020601000000
```

To delete all versions of files containing “tmp” in their path or file names that were sent to TSM by Data Protection for mySAP.com:

```
backom -c d_raw -f *tmp*
```

**Troubleshooting**

In the case of general problems, you may want to check the following setup:

- The executable backom (UNIX) or backom.exe (Windows) is located in the installation path of Data Protection for mySAP.com.
- The environment variable `DB2_VENDOR_INI` points to a DB2 Vendor INI file containing valid specifications for environment variables `TDP_DIR` and `XINT_PROFILE`. For a sample DB2 Vendor INI file, see [Appendix G, “Sample DB2 Vendor INI File”, on page 93](#).
- The environment variable `XINT_PROFILE` points to the Data Protection for mySAP.com profile. `XINT_PROFILE` is also specified in the DB2 Vendor INI file.
- The environment variable `TDP_DIR` points to a valid log path with write access and sufficient space for further writing. `TDP_DIR` is also specified in the DB2 Vendor INI file.
- The environment variable `DB2_VENDOR_LIB` points to the Data Protection for mySAP.com shared vendor library.

Backup Object Manager processing results, including error messages, are logged in file `backom.log`. The file is located in the directory denoted in environment variable `TDP_DIR`. After the installation, `TDP_DIR` points to the subdirectory `tdplog` of the path for the Data Protection for mySAP.com configuration files. If `TDP_DIR` is not set or if a log file cannot be created in the path pointed to by `TDP_DIR`, `backom.log` is created in path `/tmp` (UNIX) or in the path pointed to by environment variable `TEMP` (Windows).

The error messages logged in the file are explained in [Appendix A, “Data Protection for mySAP.com Messages”, on page 53](#). If an error occurs, solve the problem indicated in the error message and retry the action.
Chapter 6. Administration Assistant for Data Protection for mySAP.com

The Administration Assistant for Data Protection for mySAP.com consists of a Web browser based graphical interface to support and assist the customizing of Data Protection for mySAP.com and the analyzing of mySAP.com database backup and restore operations.

The Administration Assistant facilitates the configuration, monitoring, and administration of Data Protection for mySAP.com from local or remote workstations. It gives mySAP.com administrators the possibility of centralizing the database backup/restore administrative work, especially the monitoring of Data Protection for mySAP.com and mySAP.com database backup/restore actions from all mySAP.com database servers within the system landscape.

General

A mySAP.com system landscape in the real world typically unites more than one mySAP.com system. At least one mySAP.com test system and one mySAP.com production system will be used together. A typical example of this is shown in Figure 6.

![Figure 6. Example of an mySAP.com Landscape](image)

The central Administration Assistant instance is the Administration Assistant Server, which can be installed on any system (UNIX or Windows). It acts as a data collector and data distributor. This means that it collects all incoming backup/restore dependent Administration Assistant data generated by the Data Protection for mySAP.com.
Protection for mySAP.com background process Prole (see also Chapter 1, “Introducing Data Protection for mySAP.com”, on page 1) from the mySAP.com database server.

This data will be distributed over a network (LAN) to every Administration Assistant Client node (user frontend, Web browser based) actually connected, and written to various local files stored on the Administration Assistant Server.

These files serve as a data source for subsequent reviewing of performance/error analysis of backup/restore functions which have been carried out. They can also hold various Data Protection for mySAP.com configuration states (Tivoli Storage Manager configuration files, Data Protection for mySAP.com profile, SAP backup profile) in form of a configuration history.

The Administration Assistant can be understood to be a collection of four programs:
- System Configuration
- Performance Monitor
- Operations Monitor
- Problem Support

The System Configuration Tool lets you customize the SAP backup profile, the Data Protection for mySAP.com profile, and all the necessary Tivoli Storage Manager files. Online documentation guides you through the customization process and gives you descriptions of the parameters and their values. When you have finished, you can copy the Data Protection for mySAP.com profile to another Data Protection for mySAP.com node.

The Performance Monitor displays Data Protection for mySAP.com performance information while Data Protection for mySAP.com is performing a backup or restore operation. You can also display saved performance statistics when Data Protection for mySAP.com is not active. The Monitoring Tool runs on all platforms that support Data Protection for mySAP.com.

The Operations Monitor provides a centralized overview of backup status information for all mySAP.com systems registered with the central Administration Assistant server. The overview panel shows summaries of the backup status of an mySAP.com system and the state of the current backup for every system in your mySAP.com system landscape. Detailed information about all backup runs on a specific mySAP.com system can also be obtained.

Problem Support allows sending support requests directly to a Tivoli support center. Support requests can include user-specified problem descriptions. The tool automatically attempts to attach further information to the mail, such as configuration profiles and error logs.

Prerequisites

The following prerequisites are required before the Administration Assistant can be invoked:

1. Data Protection for mySAP.com must have been installed successfully (see “Installing Data Protection for mySAP.com” on page 18).
2. Java Runtime Environment (JRE) version 1.3 or higher. To check the version of the installed Java™ software on UNIX or Windows, use the following command from a command line:

```bash
java -version
```

Not all vendors provide the JRE separately. You can install the Java Development Kit (JDK), because the JRE is part of the JDK. Contact the operating system vendor to get the required JRE or JDK software.

3. Additionally, the following two Java packages must be installed:
   • Java Beans Activation Framework (JAF) version 1.1 or higher.
   • Java Mail 1.1.3 or higher

4. A fully Java 1.3-capable Web browser is required on the client machine (Java Plug-in 1.3 or higher must be installed). You can use Netscape Navigator Version 6.2 or higher or Microsoft® Internet Explorer 5.5 or higher or Mozilla 1.1 or higher.

5. For UNIX systems, the X Window system is required.

After ensuring that all these prerequisites are available, the installation process can commence. By subsequently starting the Administration Assistant you can verify the installation.

## Installation

In this section we will discuss the installation and customization of the Administration Assistant.

The installation process is subdivided into two parts:

• During the base installation of the Administration Assistant server, the English version of the Administration Assistant server is installed only.

• The NLS package, which contains all currently translated resources, can be installed at a later point in time. For the NLS package, the base installation is required.

### Installing the Administration Assistant Server (Base Installation)

To assist you with the installation procedure, the Administration Assistant package provides a setup assistant, a so-called installer that guides you through the installation process.

Note

It is necessary to have system administrator privileges to install the Administration Assistant correctly.

Both the base and NLS package of the Administration Assistant (base & NLS) are delivered as Java class files named `install.class`. 
Note
There is no need to set the environment variable CLASSPATH. However, if this variable is set in the system environment, the directory where the file install.class resides must be included.

You can now start the installation as follows:

\texttt{java install}

Only the name of the class file (install) has to be given. If the JRE is installed only, you must use the command

\texttt{jre -cp . install}

Now, the installer becomes active. Follow the instructions provided on the panels of the installation tool.

In the panel \textit{Specify ports} (see Figure 7 on page 47) it is important to:
\begin{itemize}
  \item Check for free ports in the services file (in most cases the given values are usable)
  \item Remember the specified ports for later use
\end{itemize}
In the panel **Correct Hostname**, the host name of the Administration Assistant server machine must be specified (or corrected) as shown in Figure 8 on page 48.
Remember

The communication between the Administration Assistant server and clients (Web browser or Java applet) will be done with Java RMI. An RMI communication requires a clear assignment between IP address and alias name for both of the communication clients involved.

Each of these clients must be capable of resolving the IP address of the other client to an alias name and vice versa. If you use a DHCP service on the Administration Assistant server machine, it may be possible that this machine has two names. This would be a typical DHCP problem. A clearly defined host name of the Administration Assistant server is a necessary prerequisite for subsequent communication between clients and this server (server configuration cannot be changed later).

As a result of the above, the recommendation is to use a static IP address instead of one temporarily generated by DHCP. If you are using DHCP, be aware that in the case of a reboot of the Administration Assistant server machine, this machine will be allocated a new IP address and the Administration Assistant will not be able to work.

On the panel Choose Destination Location, you have to specify the destination directory to which the application will be installed as shown in Figure 9 on page 49.
The system impact, after the setup process is finished successfully, is:

- **On UNIX systems:** Specification of a new entry in the `/etc/inittab` to start the Administration Assistant automatically (Adma:23:once:+sh "Install directory"/sadma.sh). The expression "Install directory" will be replaced with the real directory name specified during the setup process. If none was specified, the default installation directory `/usr/lpp/BkiT` will be used.

- **On Windows systems:** A new service. As a result, setup creates an entry in the Windows registry under `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services` with the name `AdminAssistant`.

### Installing the Administration Assistant NLS Package

To install the *Administration Assistant server NLS extension* you need to:

- Start the installer.
- Specify the directory where the base application has been installed.

The installer will guide you through the rest of the installation process.

After the setup process has finished successfully, do the following to ensure that the NLS extension works properly:

- **On UNIX systems:** Stop the current Administration Assistant server process using `kill <process ID>` and restart it.
- **On Windows systems:** Stop the Administration Assistant Service and restart it.

### Verifying the Installation

A dedicated verification procedure for the Administration Assistant is not needed. To verify and test the installation, you can simply start the Administration Assistant and start working with it, for example, by authorizing the users.

To start the Administration Assistant, enter its URL in the **Location** field of the Netscape browser (see Figure 10 on page 50). Note that the host name of the
Administration Assistant server (see Figure 8 on page 48) and the port used for communication (see Figure 7 on page 47) must be separated by a colon.

Each time a user starts the Administration Assistant, a Logon panel pops up for identification (see Figure 11). When the Administration Assistant is started for the first time, no user profiles for specific users are available. In this case, the initial account must be used. This account has the default user ID ADMIN and the password admin. (Note that these are case sensitive).

**Note**

When you log on to the Administration Assistant with the initial user ID, it is recommended that you change the password of that user immediately.

Once you are logged on, you can invoke the functions Operations Monitor, Performance Monitor, System Configuration, Problem Support, and User Administration by selecting the appropriate item from the ‘My Work’ portfolio.

If you are using the Administration Assistant for the first time, you can now proceed to authorize users.
Authorizing Administration Assistant Users

The User Administration function of the Administration Assistant enables you to create user accounts and to grant users only those permissions they need for their jobs.

With the user administration function it is possible to create additional accounts with appropriate rights. Rights or user permissions can be granted or revoked for a specific user profile. Every account has five authorities. These are:

- **Operations monitor authority** - permission to view backup status information of any mySAP.com system within the system landscape
- **Monitoring authority** - permission to monitor jobs
- **Configuration authority** - permission to configure Data Protection for mySAP.com
- **Problem Support authority** - permission to send support request mail to the Data Protection for mySAP.com hotline.
- **Administration authority** - permission to administer all user accounts

When you start the Administration Assistant for the first time, you will need to create profiles for authorized users. Refer to the online help for information on how to do this.

Using the Administration Assistant

Depending on the rights set in their user profiles, authorized users of the Administration Assistant can start the Configuration facility, the Performance Monitor, or the Operations Monitor.

The Administration Assistant has an integrated help function that provides detailed information on how the it can be used. The help function can be accessed by clicking on the Help button.

Detailed information about the Data Protection for mySAP.com Administration Assistant is also available in the IBM redbook *SAP R/3 Data Management with Tivoli Storage Manager*, SG245743, which can be downloaded from [http://www.redbooks.ibm.com](http://www.redbooks.ibm.com).

Uninstalling the Administration Assistant

To uninstall the Administration Assistant server proceed as follows:

- On UNIX systems, run the script Uninstall.sh.
- On Windows systems, use the script Uninstall.cmd.

Do not use the ADD/REMOVE Software Utility on Windows systems! Otherwise the service will not be removed properly!

It is recommended that you perform the uninstall option only with system administrator privileges. This will allow the Uninstaller to remove the entries either from the inittab on UNIX or from the registry on Windows systems.
Appendix A. Data Protection for mySAP.com Messages

This chapter describes how to find message files (log files) and explains the individual messages issued by Data Protection for mySAP.com.

How To Find Message Files (Log Files)

Data Protection for mySAP.com process results are logged in files. These files are located in the path indicated by the environment variable TDP_DIR. You can check the value of TDP_DIR by issuing `db2set -all`. After the installation, TDP_DIR points to the subdirectory `log` of the path for the Data Protection for mySAP.com configuration files. If TDP_DIR is not set or if a log file cannot be created in the path pointed to by TDP_DIR, the log files are created in path `/tmp` (UNIX) or in the path pointed to by environment variable TEMP (Windows).

For information on how to set or change the value of TDP_DIR, refer to “Installing Data Protection for mySAP.com” on page 18 and “Changing the Data Protection for mySAP.com Environment” on page 23.

The following log files are written:

- by the Data Protection for mySAP.com shared vendor library:
  
  `tdpdb2<SID>.<node name>.log`

- by the Backup Object Manager:
  
  `<backom>.log`
Data Protection for mySAP.com Message Explanations

The messages begin with the prefix **BKI** and are listed in numerical order.

For each message, the following information is provided:

- Message number
- Severity code

The following letters give an indication of the severity of the action that generated the message. The severity codes and their meanings are as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Severity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Error</td>
<td>Processing cannot continue.</td>
</tr>
<tr>
<td>W</td>
<td>Warning</td>
<td>Processing can continue, but problems may occur later.</td>
</tr>
<tr>
<td>I</td>
<td>Information</td>
<td>Processing continues. User response is not necessary.</td>
</tr>
</tbody>
</table>

- Explanation
- User Response

**BKI0000E**  
Profile not specified.  

**Explanation:** Data Protection for mySAP.com cannot locate the profile.  

**User Response:** Ensure that a profile is available. Note that the call must have the following form: tdppasswd -p init<SID>.util ...

**BKI0005I**  
Start of program at: time  

**Explanation:**  

**User Response:** None.

**BKI0007E**  
Mode mode requires the environment variable environment variables to be set.  

**Explanation:** Not all environment variables required have been set. At least environment variables where missing.  

**User Response:** Set the missing environment variables.

**BKI0008E**  
The environment variable name is not set correctly. The current value is value.  

**Explanation:** The value of the environment variable name is wrong.  

**User Response:** Set name to an appropriate value.

**BKI0020I**  
End of program at: time  

**Explanation:**  

**User Response:** None.

**BKI0021I**  
Elapsed time: elapsedtime  

**Explanation:** The time needed for the complete backup was elapsedtime.  

**User Response:** None.

**BKI0023I**  
Time: current_time  
Done: saved_bytes (percent) of bytes  
Estimated end time: end_time  

**Explanation:** Data Protection for mySAP.com finished saving a specific object at current_time. The saved_bytes amount of the total number of bytes have been saved. percent shows the percentage. This Data Protection for mySAP.com call will be completed at the estimated end_time.  

**User Response:** None.

**BKI0024I**  
Return code is: return code  

**Explanation:** Shows the return code of Data Protection for mySAP.com. A return code of 0 means no errors or warnings occurred. If the return code is 1, at least one warning was issued by the program. If the return code is 2, at least one error message was issued.  

**User Response:** For return codes other than 0, check the run log for warnings or error messages.

**BKI0027I**  
Time: current_time  
Objects: current_num of total_num in process: file_name  
MGMT-CLASS: management_class  
TSM Server: server name.  

**Explanation:** Data Protection for mySAP.com started saving current_num files at current_time. The total number of files to save is total_num. The file file_name is currently being processed. The files are transferred to the Tivoli Storage Manager server server name, which stores them in the Management Class management_class.  

**User Response:** None.
**BKI0031W** Object not found or not accessible: *objectname*.

**Explanation:** The object was not found or is not accessible to Data Protection for mySAP.com.

**User Response:** Check path and name and the permissions of that object and try again.

**BKI0032E** Error opening file *file name*: *system error description*

**Explanation:** A system error occurred during opening of the file *file name*. *system error description* will describe the error in more detail.

**User Response:** Read the *system error description*.

**BKI0033E** Error opening file *file name*: *system error description*

**Explanation:** See BKI0032E.

**User Response:** See BKI0032E.

**BKI0049I** Please enter password for node *nodename* on server *server name*

**Explanation:** The password for the node *nodename* on the Tivoli Storage Manager server *server name* has to be entered for storing it in the Data Protection for mySAP.com configuration file.

**User Response:** Enter the password for the corresponding Tivoli Storage Manager server.

**BKI0050I** Please enter password for node *nodename* on server *server name* again

**Explanation:** In order to avoid typing errors, you have to enter the password twice.

**User Response:** Enter the password again.

**BKI0051I** Password successfully verified for node *nodename* on server *server name*

**Explanation:** The password for the node *nodename* on the Tivoli Storage Manager server *server name* was changed successfully.

**User Response:** None.

**BKI0052E** Password verification for node *nodename* on server *server name* failed.

**Explanation:** The password you entered for the node *nodename* on the Tivoli Storage Manager server *server name* was wrong.

**User Response:** Enter the password again. If this error still exists, contact your Tivoli Storage Manager administrator.

**BKI0053I** Time: *current_time* Objects: *current_num* of *total_num* done: *file_name* with: *bytes* saved with description *object_desc*.

**Explanation:** Data Protection for mySAP.com completed saving *current_num* file at *current_time*. The total number of files to be saved is *total_num*. The file *file_name* with the size *bytes* is saved with the description *object_desc*.

**User Response:** None.

**BKI0054I** Time: *current_time* Objects: *current_num* of *total_num* done: *file_name* with: *bytes* restored with description *object_desc*.

**Explanation:** Data Protection for mySAP.com completed restoring of *current_num* file at *current_time*. The total number of files to be restored is *total_num*. The file *file_name* with the size *bytes* is restored with the description *object_class*.

**User Response:** None.

**BKI0055I** Object *objectname* with size *size* saved with description *description*.

**Explanation:** The object *objectname* was saved successfully.

**User Response:** None.

**BKI0056I** Object *objectname* with size *size* restored with description *description*.

**Explanation:** The object *objectname* was restored successfully.

**User Response:** None.

**BKI0057I** Time: *current_time* Object *objectname* with size *size* saved with description *description*.

**Explanation:** The object *objectname* was saved successfully.

**User Response:** None.

**BKI0058I** Time: *current_time* Object *objectname* with size *size* restored with description *description*.

**Explanation:** The object *objectname* was restored successfully.

**User Response:** None.
BKI0059E  You have to set the environment variable DSMI_CONFIG to the full filename of the Tivoli Storage Manager client option file 'dsm.opt'.

Explanation: Tivoli Storage Manager client option file not found.

User Response: Verify that the Tivoli Storage Manager option file dsm.opt is pointed to by DSMI_CONFIG.

BKI0060E  The parameter parameter is not known.

Explanation: The command parameter for Data Protection for mySAP.com is unknown.

User Response: Check the specified command parameter and try again.

BKI0063E  The UTL file file name is not valid.

Explanation: Data Protection for mySAP.com is not able to read the input file file name correctly.

User Response: Check the path and name of the output file and the appropriate file access permission.

BKI0064E  The option option is unknown.

Explanation: A Data Protection for mySAP.com option is invalid or unknown.

User Response: Check the specified option(s) and try again.

BKI0065E  The argument is missing for option option.

Explanation: Every Data Protection for mySAP.com option requires an argument.

User Response: Insert the missing argument and try again.

BKI0101I  Session session: Please enter 'cont' to continue or 'stop' to cancel.

Explanation: If Data Protection for mySAP.com is running in unattended mode (profile keyword BATCH), it terminates the current run if operator intervention is required.

User Response: Enter 'cont' or 'stop'.

BKI0102I  Your reply: reply.

Explanation: Data Protection for mySAP.com indicates the reply you made.

User Response: None.

BKI0311E  Request canceled by user.

Explanation: Data Protection for mySAP.com terminated at user's request.

User Response: None

BKI0451I  This version of Data Protection for mySAP.com technology (R) will expire on date.

Explanation: This is a test version that will expire on date.

User Response: None.

BKI0452E  This version of Data Protection for mySAP.com technology (R) has expired.

Explanation: This is a test version that has expired.

User Response: Order a release version of Data Protection for mySAP.com or contact your IBM/Tivoli Sales Representative.

BKI0453W  This version of Data Protection for mySAP.com technology (R) will expire in number days.

Explanation: This is a test version with a time limit. It will expire in number days.

User Response: Order a release version of Data Protection for mySAP.com or contact your IBM/Tivoli Sales Representative before the version expires.

BKI0454I  *** This copy is NOT FOR RESALE. ***

Explanation: This version is not for resale.

User Response: None.

BKI0455E  License file file name does not exist.

Explanation: The license file agent.lic was not found where expected.

User Response: Make sure that the agent.lic file resides in the same directory as the init<SID>.utl file.

BKI0456E  Unable to access license file file name.

Explanation: The license file could not be accessed.

User Response: Make sure the access permissions allow read/write access.

BKI0457E  License file file name contains invalid data/checksum.

Explanation: The license file is invalid.

User Response: Make sure you have the right agent.lic file for the right platform installed.
agent.lic files are platform dependent.

**BKI1000E**  Syntax error in line line: statement

**Explanation:** The statement statement in the Data Protection for mySAP.com profile is unknown or incorrect.

**User Response:** Correct the error and try again.

**BKI1001E**  Syntax error in file file name. Exiting Program.

**Explanation:** Data Protection for mySAP.com has detected an syntax error in the file file name and stops any action.

**User Response:** Correct the error(s) in the file file name and try again.

**BKI1002E**  BACKUPIDPREFIX must be number_of_characters characters.

**Explanation:** The length of BACKUPIDPREFIX must be number_of_characters characters.

**User Response:** Enter a BACKUPIDPREFIX with the required length (e.g., SAP___, BKI___).

**BKI1003W**  Please set REDOLOG_COPIES to a number between 1 and max_copies. Now it is set to act_copies.

**Explanation:** Data Protection for mySAP.com currently supports 1 to 9 copies of offline log files.

**User Response:** Adapt the REDOLOG_COPIES settings in the Data Protection for mySAP.com profile.

**BKI1004W** You should specify the BACKUPIDPREFIX before the TRACEFILE statement, so that the BACKUPIDPREFIX can be used in the tracefile name.

**Explanation:** The BACKUPIDPREFIX is used to build the Name of the tracefile. Therefore, BACKUPIDPREFIX must be specified before the TRACEFILE statement.

**User Response:** Define a 6-character BACKUPIDPREFIX in the Data Protection for mySAP.com profile (e.g., SAP___, BKI___).

**BKI1005W** The tracefile name trace_filename should be absolute.

**Explanation:** None.

**User Response:** Specify an absolute tracefile name, for example /db2/C21/saptrace/tracefile.

**BKI1006E**  The SERVERNAME must be less than max_char characters.

**Explanation:** You have used a SERVERNAME with more than max_char characters.

**User Response:** Use a shorter SERVERNAME.

**BKI1007E**  The NODENAME must be less than max_char characters.

**Explanation:** You have used a NODENAME with more than max_char characters.

**User Response:** Use a shorter NODENAME.

**BKI1008E**  The MANAGEMENTCLASSNAME must be less than max_char characters.

**Explanation:** You have used a MANAGEMENTCLASSNAME with more than max_char characters.

**User Response:** Use a shorter MANAGEMENTCLASSNAME.

**BKI1009W** Please set MULTIPLEX to a number between 1 and max_multiplex. Now it is set to act_multiplex.

**Explanation:** You have set multiplexing to an unsupported number. Data Protection for mySAP.com now uses act_multiplex.

**User Response:** Set multiplexing to a number between 1 and max_multiplex.

**BKI1010W** The configfile name configuration_filename should be absolute.

**Explanation:** None.

**User Response:** Specify an absolute file name, for example /db2/C21/dbs/initC21.bki

**BKI1012E** The configfilename configuration_filename could not be opened.

**Explanation:** Data Protection for mySAP.com is unable to read the file configuration_filename.

**User Response:** This error could have various reasons, try the following:
1. Check the path of the configuration file. The path must be specified in the profile (parameter CONFIG_FILE).
2. Make sure that the file access permissions are set correctly.
BKI1013E  Profile not found or permissions denied: profile_filename.

Explanation: Data Protection for mySAP.com is unable to open the profile profile_filename.

User Response: Ensure that the file pointed to by DB2_VENDOR_INI contains a valid entry XINT_PROFILE. Furthermore, this file must be readable by Data Protection for mySAP.com. See "Installing Data Protection for mySAP.com" on page 18 for details.

BKI1014I  The parameter PERF_MONITOR is no longer supported. Now it is enabled by default.

Explanation: For version 2.7 or later of Data Protection for mySAP.com, the Performance Monitor of the Administration Assistant can be used by default. Therefore, the profile parameter PERF_MONITOR is no longer needed.

User Response: None.

BKI1015I  The parameter BACKAGENT is no longer needed.

Explanation: For version 2.7 or later of Data Protection for mySAP.com, only one executable, called BACKINT, will be provided and needed. The former executable, called BACKAGENT, will no longer be supported or needed.

User Response: None.

BKI1016W  The trace file name file name could not be opened for writing!

Explanation: The trace file could not be opened for writing.

User Response: Ensure that you have specified a correct path for the trace file.

BKI1017E  The server server name is already defined. Please use another name!

Explanation: The server you want to configure is already defined.

User Response: Specify another server name. Server names have to be unique.

BKI1019E  Failed to respond to a message received from XINT.

Explanation: This message indicates an internal error.

User Response: Contact Data Protection for mySAP.com technology support.

BKI1023W  Could not establish connection to log server log server name.

Explanation: In the Data Protection for mySAP.com technology profile, log server log server name is specified (keyword LOG_SERVER). However, a connection to the server named could not be established. No log records are sent to the log server.

User Response:
- Check that the server name defined with keyword LOG_SERVER is spelled correctly in the Data Protection for mySAP.com profile.
- Make sure there is a SERVER section in the profile for the log server defined with keyword LOG_SERVER.
- Check the corresponding SERVER section and correct any setup problems.
- Make sure that the log server named is available.

BKI1200E  Cannot read/write file: file name.

Explanation: Data Protection for mySAP.com is unable to read or write a data file (file name) of a tablespace being backed up or restored.

User Response: Check the file access permission of the affected file(s). Try again. If the problem still exists, contact the mySAP.com administrator.

BKI1201E  There are no Tivoli Storage Manager Servers available.

Explanation: Data Protection for mySAP.com cannot locate a Tivoli Storage Manager server.

User Response: Install and specify at least one Tivoli Storage Manager server in the Data Protection for mySAP.com profile (keyword SERVER).

BKI1203E  Not enough sessions available (number of sessions required and number of sessions available).

Explanation: The sum of available sessions specified in the various server statements (parameter SESSIONS) does not cover the required number of sessions (parameter MAX_SESSIONS).

User Response: Change the values of the corresponding parameters in the Data Protection for mySAP.com profile, so that the condition mentioned in the explanation is fulfilled.
If you want num_redo REDOLOGCOPIES on Tivoli Storage Manager-Server servername, you should give me at least num_mc different Archive Management Classes.

**Explanation:** Data Protection for mySAP.com requires that the number of different Archive Management Classes (parameter BRARCHIVEMGTCLASS) on the Tivoli Storage Manager servers is equal to or greater than the number of log file copies (parameter REDOLOG_COPIES).

**User Response:** Define at least as many different Archive Management Classes as redo log copies requested.

There is something wrong with your CONFIG_FILE file name.

**Explanation:** There is a problem with your Data Protection for mySAP.com configuration file setup.

**User Response:** Check the file permission and the file name specified in the Data Protection for mySAP.com profile keyword CONFIG_FILE.

Program ended with code = return code

**Explanation:** The return code of the program is displayed.

**User Response:** None.

TSM Error: error text

**Explanation:** The specified TSM error occurred.

**User Response:** Check error text and correct the problem.

Average transmission rate was number GB/h (number MB/sec).

**Explanation:** The average transmission rate is displayed.

**User Response:** None.

There are no BRBACKUPMGTCLASSES available.

**Explanation:** The BRBACKUPMGTCLASSES you have specified in your init<SID>.utl file are not correct.

**User Response:** Check the management classes on the TSM server and specify correct ones.

There are no BRARCHIVEMGTCLASSES available.

**Explanation:** The BRARCHIVEMGTCLASSES you have specified in your init<SID>.utl file are not correct.

**User Response:** Check the management classes on the TSM server and specify correct ones.

Version mismatch error. Check setup (%ISS:%2SS).

**Explanation:** The version numbers of the installed backup library and PROLE do not match.

**User Response:** Check your setup or contact Data Protection for mySAP.com support.

A problem occurred during send of performance data to Administration Assistant.

**Explanation:** There was a problem sending the performance data to the Administration Assistant over the network.

**User Response:** Check your setup or contact Data Protection for mySAP.com support.

Unable to initialize connection to Administration Assistant.

**Explanation:** There was a problem initializing the connection to the Administration Assistant over the network.

**User Response:** Check your setup or contact Data Protection for mySAP.com support.

Successfully connected to PROLE on port portnumber.

**Explanation:** The backup library initiated a successful connection to the background process PROLE on port portnumber.

**User Response:** None.

Socket error while connecting to PROLE: reason.

**Explanation:** The Data Protection for mySAP.com background process PROLE is not running.

**User Response:** Start PROLE manually and try again.

No valid callback function of type func_type supplied.

**Explanation:** Internal Data Protection for mySAP.com error.

**User Response:** Contact Data Protection for mySAP.com support.
BKI2003I File file_name, BID deleted.
Explanation: The file file_name with the backup ID BID was deleted from the Tivoli Storage Manager.
User Response: None.

BKI2004E Connection to PROLE lost.
Explanation: During Data Protection for mySAP.com operation the connection to PROLE was lost. Network problems could be the reason.
User Response: Check your network environment and if PROLE is still running and try again.

BKI2005E Illegal parameter in message from PROLE. Exiting...
Explanation: This error occurs if the versions of PROLE and the backup library do not match.
User Response: Check the versions of PROLE and of the backup library you are currently using.

BKI2006E General exception in dispatcher. Exiting...
Explanation: Internal Data Protection for mySAP.com error.
User Response: Contact Data Protection for mySAP.com support.

BKI2007E Unknown Port: port
Explanation: The port specified for communication between PROLE and the backup library is unknown.
User Response: Check the port value specified when PROLE was started. Additionally, check the environment variable PROLE_PORT for the BACKINT environment. These two values must match.

BKI2008E Unable to connect to PROLE.
Explanation: Internal Data Protection for mySAP.com error.
User Response: Contact Data Protection for mySAP.com support.

BKI2009I Deleting all versions with version number <= version_number on server server_name.
Explanation: All full database backups and their corresponding log file backups will be deleted from Tivoli Storage Manager storage, if their version number is less than or equal to version_number.
User Response: None.

BKI2010E Error occurred processing FRONTEND
Explanation: An error occurred during the frontend processing.
User Response: Check the frontend script/program and the settings in the Data Protection for mySAP.com profile (keyword FRONTEND) and try again.

BKI2011E Error occurred processing BACKEND.
Explanation: An error occurred during the backend processing.
User Response: Check the backend script/program and the settings in the Data Protection for mySAP.com profile (keyword BACKEND) and try again.

BKI2012E Passwords do not match. Try again.
Explanation: The first and second password you entered do not match.
User Response: Enter the password correctly.

BKI2013I Starting FRONTEND Program.
Explanation: The frontend program is executing.
User Response: None.

BKI2014I FRONTEND program finished.
Explanation: The frontend program is finished.
User Response: None.

BKI2015I Starting BACKEND program.
Explanation: The backend program is executing.
User Response: None.

BKI2016I BACKEND program finished.
Explanation: The backend program is finished.
User Response: None.

BKI2017I Blocksize is set to num_bytes bytes.
Explanation: The operational blocksize of Data Protection for mySAP.com is num_bytes bytes.
User Response: None.

BKI2018I Exception in main message loop: description
Explanation: An error occurred during processing. The error may contain a descriptive text.
User Response: Contact your service representative.
BKI2019E  Socket error while connecting to PROLE on port number for tracing: description
Explanation: During processing, a socket error occurred on port ‘number’. ‘description’ may contain the system error text.
User Response: Check the ‘description’. If the error persists, contact your service representative.

BKI2020E  Error occurred for trace connection to PROLE on port number.
Explanation: The network connection that is used for tracing generated an error on port ‘number’.
User Response: Contact your service representative.

BKI2021E  Unable to delete file file name: description
Explanation: Unable to delete the file ‘file name’. ‘description’ may contain the system error text.
User Response: Check the ‘description’. If the error persists, contact your service representative.

BKI2022E  Unable to change mode of file file name: description
Explanation: Unable to change mode of file ‘file name’. ‘description’ may contain the system error text.
User Response: Check the ‘description’. If the error persists, contact your service representative.

BKI2023E  Error occurred during trace connection to PROLE. Tracing will stop now.
Explanation: Error occurred during trace connection to PROLE.
User Response: Tracing will stop. If the problem persists, contact your service representative.

BKI2024E  Error in connection to PROLE.
Explanation: The connection to PROLE terminated unexpectedly. This message might be displayed due to previous errors or after an unexpected termination of the PROLE process.
User Response: Check for other error messages and restart PROLE if necessary. Try again. If the problem persists, contact Data Protection for mySAP.com support.

BKI2025E  Failed to respond to a message received from PROLE.
Explanation: This is an internal error
User Response: Contact Data Protection for mySAP.com support.

BKI2026E  Unexpected exception in handler: handler
Explanation: This is an internal error.
User Response: Contact Data Protection for mySAP.com support.

BKI2027I  Using TSM-API version your api version (compiled with version).
Explanation: Version information about the TSM-API.
User Response: None

BKI2028W  Unable to terminate session session.
Explanation: This is an internal error during cleanup that has no effect on the success of the service.
User Response: None

BKI4000W  The attributes of file file name cannot be restored. Reason: errno (error_num) error_desc.
Explanation: The file file name was restored successfully but one or more file attributes (permission, ownership, date/time) of the file file name cannot be restored correctly.
User Response: Check the error number error_num and the error description error_desc to avoid this problem in the future. An initial solution could be to set the appropriate correct permission for the file file name manually.

BKI4001E  File file name cannot be created. Reason: errno (error_num) error_desc.
Explanation: The file file name to be restored could not be created/written. It is possible, that you do not have the appropriate rights for writing the file file name to the destination path.
User Response: Check the error number error_num and the error description error_desc to avoid this problem in the future. Furthermore, check the write permission of the user who started the restore.

BKI4002E  Error during restore of file file name. Reason: errno (error_num) error_desc.
Explanation: An error occurs during the restore process of the file file name.
User Response: Check the error number error_num and the error description error_desc to avoid this problem in the future.
**BKI4003E** Error reading file *file name*. Only read *num_bytes* out of *all_bytes*.

**Explanation:** An error occurs reading the file *file name*. Only *num_bytes* of *all_bytes* could be read.

**User Response:** Try your last action again. If the error still exists, contact Data Protection for mySAP.com support.

**BKI4004E** Error writing file *filename*. Only wrote *num_bytes* out of *all_bytes*.

**Explanation:** An error occurs writing the file *file name*. Only *num_bytes* of *all_bytes* could be written.

**User Response:** Try your last action again. If the error still exists, contact Data Protection for mySAP.com support.

**BKI4005E** Error allocating memory block for file *file name*. BLOCKSIZE may be too large.

**Explanation:** Data Protection for mySAP.com was not able to request new memory blocks during the backup of file *file name*.

**User Response:** Verify that you have set a valid value for BLOCKSIZE. If you are not sure what value is valid, comment it out so the default value is used. Furthermore, you can check if you have enough RAM available with your machine. Also, check the memory usage during backup. It may be necessary to stop another application, increase memory, or change the configuration of Data Protection for mySAP.com.

**BKI4006E** Error allocating memory block for file *file name*. BLOCKSIZE may be too large.

**Explanation:** See BKI4005E.

**User Response:** See BKI4005E.

**BKI4007E** *file name* cannot be read. Reason: *errno*(*errno number*) *errno text*.

**Explanation:** Data could not be read due to some system error. Check *errno text* for further information. If this error recurs, this might indicate some hardware problems.

**User Response:** Contact your system administrator.

**BKI5000E** Tivoli Storage Manager Error: *error_message*

**Explanation:** During a connection of Data Protection for mySAP.com to Tivoli Storage Manager server, a Tivoli Storage Manager error *error_message* occurred.

**User Response:** Use the Tivoli Storage Manager Messages guide and correct the Tivoli Storage Manager server error. Try your last action again.
Appendix A. Data Protection for mySAP.com Messages

BKI5010E  Tivoli Storage Manager Error:  
Explanation:  See BKI5000E.  
User Response:  See BKI5000E.

BKI5011E  Tivoli Storage Manager Error:  
Explanation:  See BKI5000E.  
User Response:  See BKI5000E.

BKI5012E  Cannot open TSM API message text file.  
Check if DSMI_DIR is set correctly.  
Current value of DSMI_DIR is:  value  
Explanation:  The TSM-API could not be initialized.  
User Response:  Correct the value of the environment variable DSMI_DIR.

BKI5013E  Value for name is too long. Current value:  value  
Explanation:  The value of the environment variable name has too many digits.  
User Response:  Check if the variable is set correctly.

BKI5014E  Tivoli Storage Manager Error:  
Explanation:  See BKI5000E.  
User Response:  See BKI5000E.

BKI5015W  Data description could not be restored, because it was backed up with a newer version (objInf=support information)  
Explanation:  The TSM server hosts backups (i.e. data description) which were made with a new version of backint. Backint ignores this data in the further processing.  
User Response:  Upgrade backint

BKI7049I  The default ProLE port will be used.  
Explanation:  The port for the internal communication of Data Protection for mySAP.com is set during installation. The message indicates that this port is being used.  
User Response:  None.

BKI7051E  The environment variable XINT_PROFILE is not set. It must be set and contain the full qualified path to the *.utl file to be used.  
Explanation:  The way Data Protection for mySAP.com works is specified in a profile. When called, Data Protection for mySAP.com looks for the environment variable XINT_PROFILE which must contain the fully qualified path to the profile.  
User Response:  Check the environment for XINT_PROFILE of the user who started Data Protection for mySAP.com.

BKI7053E  Service setup failed due to previous error.  
Explanation:  The initialization of Data Protection for mySAP.com failed due to previous errors.  
User Response:  Check the Data Protection for mySAP.com log file for further detailed messages.

BKI7055E  Service open failed due to previous error in data mover.  
Explanation:  The Data Protection for mySAP.com command could not be started due to previous errors.  
User Response:  Check the Data Protection for mySAP.com log file for further detailed messages.

BKI7056E  Service open failed because configured TSM server could not be accessed.  
Explanation:  The Data Protection for mySAP.com command could not be started because the TSM server defined in the profile could not be accessed.  
User Response:  Check the Data Protection for mySAP.com log file for further detailed messages.

BKI7057E  Service open failed because all configured sessions are currently in use.  
Explanation:  The Data Protection for mySAP.com command could not be started because all configured sessions in the profile are currently in use.  
User Response:  Check the Data Protection for mySAP.com log file for further detailed messages.

BKI7058E  Service open failed because more than one file is found with the same name.  
Explanation:  The Data Protection for mySAP.com command could not be started because two or more files with the same name were found.  
User Response:  Check the Data Protection for mySAP.com log file for further detailed messages.
Service open failed because cause the file is not found.

Explanation: The Data Protection for mySAP.com command could not be started because a file specified was not found.

User Response: Check the Data Protection for mySAP.com log file for further detailed messages.

The command is: command name.

Explanation: This is an information message echoing the command.

User Response: None.

Return Code is: return code.

Explanation: This message shows the return code of the Backup Object Manager.

Valid return codes:
0 The requested action was performed successfully.
4 The requested action was performed successfully; however, some warnings were issued.
8 or greater The requested action could not be performed due to errors. In this case, an error message should be logged, too.

User Response: None if the return code is 0.

If the return code is greater than 0, analyze the error and/or warning messages. Resolve errors before starting the action again.

No command was specified.

Explanation: backom was called without a command.

User Response: Check the command syntax and correct the call.

Command option command option requires an argument.

Explanation: A command option requiring an argument was specified without an argument.

User Response: Check the command syntax and correct the call.

Invalid command command.

Explanation: backom was called with an invalid command.

User Response: Check the command syntax and correct the call.

Error during action.

Explanation: An error occurred while performing the named action.

User Response: Look for other error messages in order to analyze the problem.

Tablespace online restore is not allowed.

Explanation: Either the database setup or the kind of backup prevents an online tablespace backup.

User Response: If you need to do a tablespace restore it must be done offline.

The DB2 UDB instance name can consist of at most 8 characters.

Explanation: The name given for the DB2 instance does not comply with the DB2 naming conventions.

User Response: Correct the DB2 instance name and retry the action.

The DB2 UDB database alias can consist of at most 8 characters.

Explanation: The name given for the DB2 alias does not comply with the DB2 naming conventions.

User Response: Correct the DB2 alias name and retry the action.

Invalid node. It must consist of the format node format.

Explanation: The name given for the DB2 node does not comply with the DB2 naming conventions. Node numbers must be specified in the displayed format, for example ‘NODE0000’ or ‘0000’.

User Response: Correct the DB2 node number and retry the action.

Invalid timestamp. It must consist of 14 digits with format yyyyymmddhhmmss or digits and wildcards * or ?.

Explanation: The format of the timestamp is: yyyyymmddhhmmss

where:
- yyyy is the year, specified as four digits,
- mm is the month, specified as two digits, with leading zero for the months January to September,
- dd is the day of the month, specified as two digits, with leading zero for days 1 to 9,
- hh is the hour of the day, 00 to 23, with leading zero for hours 0 to 9,
- mm is the minutes of the hour, 00 to 59, with leading zero for minutes 0 to 9,
• ss is the second of the minute, 00, to 59, with leading zero for seconds 0 to 9.

Any digits can be replaced by wildcards ‘*’ or ‘?’, where
• * means any number of any digits,
• ? means exactly one digit of any value.

User Response: Correct the timestamp and retry the action.

BKI8529E Invalid log sequence number. It must consist of the log sequence format.
Explanation: The information on the log sequence number(s) does not comply with the expected format. Accepted log sequence numbers are for example ‘123’ or ‘S000123.LOG’.
User Response: Correct the log sequence number(s) and retry the action.

BKI8530E File file name cannot be opened.
Explanation: Either an existing file could not be opened, or a file should not be created.
User Response: Check the attributes of the file and/or its directory. For backup processing, read access is required for the files to be backed up. For restore processing, write access is required for the target location of the files to be restored.

BKI8531E Directory file path does not exist or cannot be accessed.
Explanation: A file path cannot be accessed.
User Response: Check the attributes of the file and/or its directory. For backup processing, read access is required for the files to be backed up. For restore processing, write access is required for the target location of the files to be restored.

BKI8534E Command option command option is missing.
Explanation: A command was issued without specifying a required command option.
User Response: Check the command syntax and correct the call.

BKI8541I Using profile profile path.
Explanation: The profile named is used for the current action.
User Response: None.

BKI8542E Profile profile path cannot be read.
Explanation: The Backup Object Manager tried to use the profile named but the profile was not available or could not be read. The location of the profile is specified via command line as argument to option ‘-e’ or in environment variable ‘XINT_PROFILE’.
User Response: Make sure that the profile is available at the location specified in option ‘-e’ on the command line or in environment variable ‘XINT_PROFILE’.
Check the attributes of the profile and the corresponding directory and make sure that the file can be accessed.

BKI8543I Querying TSM for file(s) file list.
Explanation: The Backup Object Manager checks if the files listed are available on the TSM server(s) specified in the corresponding profile.
User Response: None.

BKI8545E No image type image(s) found.
Explanation: A request could not be satisfied because the files to be processed are not available on the TSM server.
User Response: Check if the file(s) were specified correctly in the request.

BKI8546E Environment variable environment variable is not set or not set correctly.
Explanation: A required environment variable is not set at all or has a value that is not allowed.
User Response: Check the documentation for the appropriate values of the environment variable named and set its value accordingly.

BKI8547I Using DB2_VENDOR_LIB lib path.
Explanation: The library named is used for the current action.
User Response: None.

BKI8548I Elapsed time: time value.
Explanation: After restore and delete, the time elapsed during the action is displayed.
User Response: None.
**BKI8549E** Unable to create file *file name*.

**Explanation:** During restore, the file to be restored cannot be created in the target location.

**User Response:** Check if there is sufficient space available for the file to be restored.

Check the attributes of the target directory; write access is required.

If the target file already exists, check that write access is granted.

**BKI8550W** Environment variable *environment variable* for output mode has wrong value. Using default.

**Explanation:** The default output mode can be overridden by the named environment variable. Accepted values are "short", "normal", or "detailed". The system default is "short" for actions on DB2 log files, "normal" otherwise.

**User Response:** Specify an appropriate value for the environment variable named, or remove the environment variable.

**BKI8551E** Not all data written to *file path*.

**Explanation:** Restoring raw or DB2 log file data ended before all data retrieved from TSM could be written to the file named.

The file is incomplete.

**User Response:** Make sure there is sufficient space for the data to be restored.

**BKI8552E** File *file path* could not be closed.

**Explanation:** After restoring raw or DB2 log file data, the target file could not be closed.

**User Response:** Retry the action.

**BKI8800I** The command is: *command*.

**Explanation:** Displays the Data Protection for mySAP.com command that was issued. The following commands are possible: Backup, Restore, Archive/Retrieve.

**User Response:** None.

**BKI8801I** PID of calling process: *PID_number*.

**Explanation:** Displays the process id of the DB2 process which called the Data Protection for mySAP.com shared library.

**User Response:** None.

**BKI8802I** Found *number* backup image(s) on TSM server.

**Explanation:** For restore and delete operations Data Protection for mySAP.com queries TSM for backup images by means of a timestamp and shows the number of found images.

**User Response:** None.

**BKI8803I** The DB2 UDB backup image size for this session is about *size*.

**Explanation:** The estimated size of the data to be backed up is displayed.

**User Response:** None.

**BKI8804W** The recovery log could not be written.

**Explanation:** After every backup or restore, Data Protection for mySAP.com writes a record into the recovery log file *tdprlf.<SID>.<node_name>.log*. It is located in the path pointed to by environment variable TDP_DIR.

**User Response:** Check, if the permissions are set correctly and if there is sufficient free space in your filesystem.

**BKI8805W** The restore was cancelled by the user. Existing data not overwritten.

**Explanation:** During a restore, the user decided not to overwrite existing data. As a result, the action was cancelled.

**User Response:** None.

**BKI8810I** Cleaning up resources.

**Explanation:** All resources used by Data Protection for mySAP.com will be released.

**User Response:** None.

**BKI9000E** System error: *error*

**Explanation:** Data Protection for mySAP.com has found the following error: *error*. This is a ‘catch-all’ error code for unpredictable system errors.

**User Response:** Contact your service representative.

**BKI9001E** Internal error: *error*

**Explanation:** Data Protection for mySAP.com has found the following internal error: *error*.

**User Response:** Contact Data Protection for mySAP.com support.
BKI9002E  Error in stream task: %1$S
Explanation: There was an error in the processing of a data stream. Data Protection for mySAP.com will stop processing.
User Response: Contact Data Protection for mySAP.com support.

BKI9005E  A not supported by B.
Explanation: The installed version of product B does not support product A. Most likely you need to upgrade product B.
User Response: Contact the Data Protection for mySAP.com support.

BKI9006E  Internal error while reading environment variable: variable.
Explanation: This is an internal error.
User Response: Contact Data Protection for mySAP.com support.

BKI9007W  An error occurred while terminating the application: the error
Explanation: While terminating the application, an error occurred. This has no impact on the success of the operation.
User Response: None

BKI9200E  Additional support information: An Exception was thrown at position: position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9201E  Additional support information: An Exception was thrown at position: position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9202E  Additional support information: An Exception was thrown at position: position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9203E  Additional support information: An Exception was thrown at position: position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9204E  Additional support information: An Exception was thrown at position: position (text=description).
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9205E  Additional support information: Unable to instantiate name at position position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.

BKI9206E  Additional support information: Unable to use actual when expecting expected at position position.
Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.
User Response: Contact Data Protection for mySAP.com support.
BKI9207E Additional support information: An Exception was thrown at position: position.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9208E System error errno: errno text at position position.

Explanation: A system call failed with errno.

User Response: Check errno and errno text with your system administrator. If you cannot resolve the problem, contact Data Protection for mySAP.com support.

BKI9209E Additional support information: No handler registered for message type message. Thrown at position: position.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9210E ESD_AbortDispatchingException thrown at position: position.

Explanation: An internal error occurred.

User Response: Contact Data Protection for mySAP.com support.

BKI9211E Additional support information: An Exception was thrown at position: position. (State state)

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9212E Additional support information: No handler registered for message type type. Thrown at position: position.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9213E Internal error: A memory allocation request failed at position: position.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9219E Additional support information: Invalid error type type encountered.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9220E Additional support information: Second call of call.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9300E Additional support information: "send" continued at client's request.

Explanation: This error may have been caused by previous errors.

User Response: Check for previous errors and correct them.

BKI9301E Additional support information: State state does not match state pattern pattern.

Explanation: This error message typically follows a previous error. If so this error message can be ignored. Otherwise contact your Data Protection for mySAP.com support.

User Response: Contact Data Protection for mySAP.com support.

BKI9302E Additional support information: Unused ESD_ReturnChannel destroyed. Dumping callstack: callstack

Explanation: This error message typically follows a previous error. If so this error message can be ignored.
Otherwise contact your Data Protection for mySAP.com support.

**User Response:** Contact Data Protection for mySAP.com support.

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**BKI9306I** Dumping callstack: call stack.

**Explanation:** This message is always preceded by an error message indicating the problem. It provides additional information that might help your Data Protection for mySAP.com support to analyze the cause of the problem.

**User Response:** If you need to call Data Protection for mySAP.com support, provide the information given in this message together with the error information.

---

**BKI9307E** Did not find a winsock dll compatible with version *expected version*. Version *found is available version*.

**Explanation:** Data Protection for mySAP.com failed to load the appropriate winsock dll.

**User Response:** Contact your system administrator

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**BKI9308E** A socket request timed out after processing *number of bytes bytes* at position.

**Explanation:** A socket request was issued with a timeout and the requested action could not be completed within the time specified. It was cancelled after processing *number of bytes bytes*.

**User Response:** If you need to call Data Protection for mySAP.com support, provide the information given in this message together with the error information.
Appendix B. Password Handling

Consider the following alternatives with their implications:

**No password required by Tivoli Storage Manager (AUTHENTICATION OFF)**

This is the simplest method; however, no security can be enforced. Every user connected to this server (authentication is set OFF on the Tivoli Storage Manager server level) can access Tivoli Storage Manager without a password.

This method is only recommended if adequate security measures can be established otherwise, for example, if Tivoli Storage Manager is only used for mySAP.com (no other clients are registered), and the respective authorizations are set in the UNIX system.

**Manual password generation**

This method is simple to set up and provides password security, however, it requires a synchronized update of the password in Tivoli Storage Manager (client) and Data Protection for mySAP.com (command line). This method is only recommended during installation and testing together with a sufficiently long expiration period (to avoid having to change the password). It is not recommended for production operation.

**Password set by Tivoli Storage Manager**

In this case you do not have to synchronize the passwords manually on the Tivoli Storage Manager server and client sides. The generation and synchronization of passwords is handled by a Tivoli Storage Manager program. Tivoli Storage Manager sets the password automatically on a per-node basis according to the expiration specification. This method is recommended for an automated production environment.
Configuration Matrix (UNIX)

After you have selected the suitable password handling alternative, follow the configuration matrix to set the keywords/parameters in the different profiles accordingly. Proceed as indicated by the step number.

Table 2. Password Handling for UNIX

<table>
<thead>
<tr>
<th>Step</th>
<th>Profile/Action</th>
<th>Parameter</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tivoli Storage Manager admin</td>
<td>AUTHENTICATION EXPIRATION PERIOD (see note 1)</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n.a.</td>
</tr>
<tr>
<td>2</td>
<td>dsm.sys</td>
<td>PASSWORDACCESS PASSWORDDIR NODENAME (see note 5)</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n.a.</td>
</tr>
<tr>
<td>3</td>
<td>Tivoli Storage Manager client (root user)</td>
<td>SET PASSWORD</td>
<td>n.a.</td>
</tr>
<tr>
<td>4</td>
<td>Data Protection for mySAP.com profile (init&lt;SID&gt;.utl)</td>
<td>For each SERVER statement specify: PASSWORDREQUIRED ADSMNODE</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;nodename&gt;</td>
</tr>
<tr>
<td>5</td>
<td>Data Protection for mySAP.com command line</td>
<td>For each SERVER statement specify: tdppasswd -p initSID.utl</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Notes:
1. See Tivoli Storage Manager documentation.
2. If you are using manual password generation during testing, make sure that the expiration period is set to a sufficiently long time (> 60 days).
3. For an initial setup, this password must be the same as was specified when registering the node to Tivoli Storage Manager. The password must be changed first on the Tivoli Storage Manager server and then in the Data Protection for mySAP.com product.
4. ADSMNODE must not be set when PASSWORDACCESS generate is set.
5. The users <SID>adm and db2<SID> must have read and write permission for the path specified.

Configuration Matrix (Windows)

After you have selected the suitable password handling alternative, follow the configuration matrix to set the keywords/parameters in the different profiles accordingly. Proceed as indicated by the step number.
### Table 3. Password Handling for Windows

<table>
<thead>
<tr>
<th>Step</th>
<th>Profile/Action</th>
<th>Parameter</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No Manual Set by Tivoli Storage Manager</td>
</tr>
<tr>
<td>1</td>
<td>Tivoli Storage Manager admin</td>
<td>AUTHENTICATION EXPIRATION PERIOD (see note 1)</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>On &lt;n days&gt; (see note 2)</td>
</tr>
<tr>
<td>2</td>
<td>&lt;server&gt;.opt</td>
<td>PASSWORDACCESS PASSWORDDIR (see note 5)</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NODENAME</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PROMPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GENERATE &lt;path&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Tivoli Storage Manager client</td>
<td>SET PASSWORD</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;password&gt; (see note 3)</td>
</tr>
<tr>
<td>4</td>
<td>Data Protection for mySAP.com profile init&lt;SID&gt;.utl</td>
<td>For each SERVER statement specify: PASSWORDREQUIRED ADSMNODE</td>
<td>NO &lt;nodename&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>YES &lt;nodename&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NO (see note 4)</td>
</tr>
<tr>
<td>5</td>
<td>Data Protection for mySAP.com command line</td>
<td>For each SERVER statement specify: tdppasswd -p initSID.utl</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;password&gt; (see note 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;password&gt;</td>
</tr>
</tbody>
</table>

### Notes:

1. See Tivoli Storage Manager documentation.
2. If you are using manual password generation during testing, make sure that the expiration period is set to a sufficiently long time (> 60 days).
3. For an initial setup this password must be the same as was specified when registering the node to Tivoli Storage Manager. The password must be changed first on the Tivoli Storage Manager server and then in the Data Protection for mySAP.com product.
4. ADSMNODE must not be set when PASSWORDACCESS generate is set.
5. The users <SID>adm and sapservice<SID> must have read and write permission for the path specified.
Appendix C. Alternate/Parallel Backup Paths and Backup Servers

With Data Protection for mySAP.com we use the term "path" to denote a connection between a Tivoli Storage Manager client, or better ADSM "node", and a Tivoli Storage Manager server.

Data Protection for mySAP.com provides the capability for controlling alternate backup paths and alternate backup servers in order to use several communication links between Tivoli Storage Manager clients to:

- Increase throughput by transferring data:
  - Over multiple paths simultaneously
  - To and from several servers in parallel
- Increase the availability of the Tivoli Storage Manager client-to-server communication
- Enable disaster recovery backup to a special (remote) Tivoli Storage Manager server

In the profile init<SID>.utl, each path is defined by a server statement and the corresponding definitions in the Tivoli Storage Manager client system option file dsm.sys (UNIX) or <server>.opt (Windows).

The statement SERVER <server 1..n> denotes Tivoli Storage Manager servers in the Data Protection for mySAP.com profile. This corresponds to the statement SERVERNAME <server 1..n> in the Tivoli Storage Manager client option file(s). These servers are identified by their TCPSERVERADDRESS and can be located on one system (multiple paths) or several systems (multiple servers).

SESSIONS denotes the number of parallel session Data Protection for mySAP.com will schedule for the given path.

**Note**

If only 1 path is used, SESSIONS must be equal to MAX_SESSIONS, the parameter identifying the total number of parallel sessions to be used (equivalent to number of tape drives/management classes).

Data Protection for mySAP.com attempts to communicate with the Tivoli Storage Manager server using the first path in the profile. If this proves successful, Data Protection for mySAP.com starts the number of parallel sessions as specified for this path; if the attempt was unsuccessful, this path is skipped, and Data Protection for mySAP.com continues with the next path. This continues until as many sessions are active as were specified in the total session number (MAX_SESSIONS). If this number is never reached (for example, because several paths were inactive), Data Protection for mySAP.com terminates the backup job.
Parameter Settings - SERVER Statement

The SERVER statement appears in the Data Protection for mySAP.com profile, and there are corresponding keywords in the Tivoli Storage Manager client option file. (Depending on the choice of password handling, some parameters are ignored.) The connection of the sections in the Data Protection for mySAP.com profile and the Tivoli Storage Manager client option file is established from the logical server name, which is defined in the keywords SERVER or SERVERNAME.

Table 4. SERVER Statement and Appropriate Profile and Option File Settings.

<table>
<thead>
<tr>
<th>Configuration possibilities</th>
<th>Data Protection for mySAP.com profile init&lt;SID&gt;.utl</th>
<th>Tivoli Storage Manager client option file dsm.sys or &lt;server&gt;.opt [2]</th>
</tr>
</thead>
<tbody>
<tr>
<td>single path; no password or manual password</td>
<td>SERVER &lt;server&gt; &lt;br&gt; ADSMNODE &lt;node&gt; [1]</td>
<td>SERVERNAME &lt;server&gt; &lt;br&gt; TCP SERVER ADDRESS &lt;address&gt; &lt;br&gt; NODENAME must not be specified</td>
</tr>
<tr>
<td>single path; automatic password by Tivoli Storage Manager</td>
<td>SERVER &lt;server&gt; &lt;br&gt; ADSMNODE must not be specified</td>
<td>SERVERNAME &lt;server&gt; &lt;br&gt; NODENAME &lt;node&gt; &lt;br&gt; TCP SERVER ADDRESS &lt;address&gt;</td>
</tr>
<tr>
<td>several paths/servers; no password or manual password</td>
<td>SERVER &lt;server 1&gt; &lt;br&gt; ADSMNODE &lt;node 1&gt; &lt;br&gt; • &lt;br&gt; • &lt;br&gt; SERVER &lt;server n&gt; &lt;br&gt; ADSMNODE &lt;node n&gt;</td>
<td>SERVERNAME &lt;server 1&gt; &lt;br&gt; NODENAME must not be specified &lt;br&gt; TCP SERVER ADDRESS &lt;address 1&gt; &lt;br&gt; • &lt;br&gt; • &lt;br&gt; SERVERNAME &lt;server n&gt; &lt;br&gt; NODENAME must not be specified &lt;br&gt; TCP SERVER ADDRESS &lt;address n&gt;</td>
</tr>
<tr>
<td>several paths/servers; automatic password by Tivoli Storage Manager [3]</td>
<td>SERVER &lt;server 1&gt; &lt;br&gt; ADSMNODE must not be specified &lt;br&gt; • &lt;br&gt; • &lt;br&gt; SERVER &lt;server n&gt; &lt;br&gt; ADSMNODE must not be specified</td>
<td>SERVERNAME &lt;server 1&gt; &lt;br&gt; NODENAME &lt;node 1&gt; &lt;br&gt; TCP SERVER ADDRESS &lt;address 1&gt; &lt;br&gt; • &lt;br&gt; • &lt;br&gt; SERVERNAME &lt;server n&gt; &lt;br&gt; NODENAME &lt;node n&gt; &lt;br&gt; TCP SERVER ADDRESS &lt;address n&gt;</td>
</tr>
</tbody>
</table>

Notes:

[1] If ADSMNODE is not specified, the host name is used.

[2] On UNIX, dsm.sys is the single client option file for all Tivoli Storage Manager servers. On Windows, there is a separate client option file <server>.opt for each Tivoli Storage Manager server.

[3] If two different physical machines have the same TSM node name or if multiple paths are defined on one node using several server stanzas, passwordaccess generate may only work for the first stanza that is used after password expiration. During the first client-server contact, the user is prompted for the same password for each server stanza separately, and a copy of the password is stored for each stanza. When the password expires, a new password is generated for the stanza that connects the first client-server contact. All subsequent attempts to connect via other server stanzas will fail, because there is no logical link between their copies of the old password.
and the updated copy generated by the first stanza used after password expiration.

To avoid the problem, update the passwords before they expire, to solve the problem if the passwords have expired, proceed as follows:

1. dsmadmc and update the password on the server.
2. Run dsmc -servername=stanza1 and use the new password to generate a proper entry.
3. Run dsmc -servername=stanza2 and use the new password to generate the proper entry.

EXAMPLE 1: Use of Alternate/Parallel Paths for Increased Availability

Assume the following configuration:

Tivoli Storage Manager server with:
- 2 tape drives
- 2 LAN connections:
  - Fast Ethernet (TCP/IP address yyy.yyy.yyy.yyy)
  - Token Ring (TCP/IP address xxx.xxx.xxx.xxx)

mySAP.com database server connected to Token Ring and Ethernet.

A backup is normally performed using the Ethernet LAN (SERVER statement 1). If the Ethernet is down, the backup should be performed using the Token Ring connection (SERVER statement 2), although data transfer will take longer.

The definitions in the Data Protection for mySAP.com profile could be as shown in the example below.

If path 1 is active, Data Protection for mySAP.com will start the 2 sessions as defined in the SERVER statement for path 1. Since MAX_SESSIONS is also 2, no more sessions will be started.

If path 1 is inactive, Data Protection for mySAP.com will start 2 sessions on path 2. Since this equals the MAX_SESSIONS definition as well, backup will be executed using path 2.
<table>
<thead>
<tr>
<th>MAX_SESSIONS</th>
<th>2</th>
<th># 2 tape drives</th>
</tr>
</thead>
</table>

**SERVER server_a**  
ADSMNODE - C21  
SESSIONS 2  
PASSWORDREQUIRED YES  
BRBACKUPMGTCCLASS mdb  
BRARCHIVEMGTCLASS mlog1 mlog2  
# USE_AT 0123456

**SERVER server_b**  
ADSMNODE - C21  
SESSIONS 2  
PASSWORDREQUIRED YES  
BRBACKUPMGTCCLASS mdb  
BRARCHIVEMGTCLASS mlog1 mlog2  
# USE_AT 0123456
EXAMPLE 2: Use of Alternate/Parallel Paths for Increased Performance

Assume the following configuration:

Two Tivoli Storage Manager servers with connections to two FDDI networks:
- server_a, TCP/IP address xxx.xxx.xxx.xxx
- server_b, TCP/IP address yyy.yyy.yyy.yyy
- Each of these servers has:
  - two tape drives

An mySAP.com database server connected to two FDDI networks.

Backups are done on both systems every day.

The definitions in the Data Protection for mySAP.com profile could be as shown in the example below.

<table>
<thead>
<tr>
<th>Data Protection for mySAP.com profile. Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX_SESSIONS 4 # 4 tape drives</td>
</tr>
<tr>
<td>.</td>
</tr>
<tr>
<td>SERVER server_a # via FDDI</td>
</tr>
<tr>
<td>ADSMNODE  C21</td>
</tr>
<tr>
<td>SESSIONS 2</td>
</tr>
<tr>
<td>PASSWORDREQUIRED YES</td>
</tr>
<tr>
<td>BRBACKUPMGTCCLASS MDB</td>
</tr>
<tr>
<td>BRARCHIVEMGTCCLASS MLOG1 MLOG2 MLOG3 MLOG4</td>
</tr>
<tr>
<td># USE_AT 1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

| SERVER server_b # via FDDI                      |
| ADSMNODE  C21                                   |
| SESSIONS 2                                      |
| PASSWORDREQUIRED YES                             |
| BRBACKUPMGTCCLASS MDB                           |
| BRARCHIVEMGTCCLASS MLOG1 MLOG2 MLOG3 MLOG4      |
| # USE_AT 1 2 3 4 5 6 7                           |
EXAMPLE 3: Use of Alternate/Parallel Servers for Disaster Recovery

Assume the following configuration:

Two Tivoli Storage Manager servers with connections to an FDDI network:
- server_a, TCP/IP address xxx.xxx.xxx.xxx
- server_b, TCP/IP address yyy.yyy.yyy.yyy

Each of these servers with:
- four tape drives (MAX_SESSIONS 4).

An mySAP.com database server connected to this FDDI network.

Normal backups are to be performed with server a, which is local to the mySAP.com database server. Every Friday a disaster recovery backup should be stored on a remote Tivoli Storage Manager server (server b).

The definitions in the Data Protection for mySAP.com profile could be as shown in the example below.

<table>
<thead>
<tr>
<th>Data Protection for mySAP.com profile. Example 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX_SESSIONS 4 # 4 tape drives</td>
</tr>
<tr>
<td>.</td>
</tr>
<tr>
<td>SERVER server_a # via FDDI</td>
</tr>
<tr>
<td>ADSMNODE C21</td>
</tr>
<tr>
<td>SESSIONS 4</td>
</tr>
<tr>
<td>PASSWORDREQUIRED YES</td>
</tr>
<tr>
<td>BRBACKUPMGTCLASS MDB</td>
</tr>
<tr>
<td>BRARCHIVEMGTCLASS MLOG1 MLOG2 MLOG3 MLOG4</td>
</tr>
<tr>
<td>USE_AT 1 2 3 4</td>
</tr>
<tr>
<td>.</td>
</tr>
<tr>
<td>SERVER server_b # via FDDI</td>
</tr>
<tr>
<td>ADSMNODE C21</td>
</tr>
<tr>
<td>SESSIONS 4</td>
</tr>
<tr>
<td>PASSWORDREQUIRED YES</td>
</tr>
<tr>
<td>BRBACKUPMGTCLASS MDB</td>
</tr>
<tr>
<td>BRARCHIVEMGTCLASS MLOG1 MLOG2 MLOG3 MLOG4</td>
</tr>
<tr>
<td>USE_AT 5 # for Disaster Recovery</td>
</tr>
</tbody>
</table>
Appendix D. The Data Protection for mySAP.com Profile

This section describes the Data Protection for mySAP.com profile, which is used to customize the way Data Protection for mySAP.com operates. A sample profile initSID.tul is provided on the installation medium. Data Protection for mySAP.com reads the profile before it executes.

The following rules apply to the syntax:
- Each line is analyzed separately.
- Keywords can start in any column of the line.
- Keywords must not be preceded by any string, except blanks.
- If a keyword is encountered several times, the last one is used.
- File processing ends when the END keyword is encountered or the end of file is reached.
- All keywords must be in upper case.
- The comment symbol is #. Scanning of the current line stops when the comment symbol is encountered. No comment is allowed between the keyword and the value(s). For example:
  #BRARCHIVEMGTCLASS MLOG1 <-- correct
  BRARCHIVEMGTCLASS MLOG1 # <-- correct
  BRARCHIVEMGTCLASS # MLOG1 <-- WRONG

A few keywords are required in any case, but most are optional. Each of the optional keywords has a preset default value.

Keyword Reference

ADSMNODE node_name
If specified, node_name must be registered to the Tivoli Storage Manager server as a Tivoli Storage Manager node. With this option you can assign a different node name to your database system. It should be used if you have several mySAP.com DB2 database systems in your network with the same name, for example, <SID>, and they all use the same Tivoli Storage Manager server.

  Keep in Mind
  This parameter must be defined in conjunction with the respective SERVER statement, as shown in the sample profile.

_BACKEND pgmname [parameterlist ...]
Specifies a program pgmname that is called by Data Protection for mySAP.com after the backup function has completed and before program control is returned to the SAP backup utility.

pgmname is either a fully qualified file name or simply a file name. In the latter case the default search path is used to find the program.

If not specified, no backend processing is done.

Example (for UNIX):
_BACKEND write operator@remotesite R3 Backup is completed.
This sends a message to a remote user when the backup has finished.

**BACKUPIDPREFIX** 6charstring **SAP**

Specifies a 6-character prefix that is used to build a backup identifier for each archived object. The total length of the backup ID is 16 characters.

**BRARCHIVEMGTCLASS** management_class [management_class...]

Specifies the Tivoli Storage Manager management class(es) Data Protection for mySAP.com uses to back up offline log files. Each parameter string can consist of up to 30 characters.

**Keep in Mind**

This parameter must be defined in conjunction with the respective SERVER statement, as shown in the sample profile.

**BRBACKUPMGTCLASS** management_class [management_class...]

Specifies the Tivoli Storage Manager management class(es) Data Protection for mySAP.com uses to back up the DB2 database. The parameter string can consist of up to 30 characters.

**Keep in Mind**

This parameter must be defined in conjunction with the respective SERVER statement, as shown in the sample profile.

**BUFFSIZE** n | 131072

This parameter specifies the block size for the buffers passed to the Tivoli Storage Manager API functions. The valid range is from 4096 to 262144. Inappropriate values will be adjusted automatically.

If not specified, the default value is 131072 (128 KB) for UNIX systems and 32768 (32 KB) for Windows systems. In most cases, this parameter has little influence on performance.

**CONFIG_FILE** path

Specifies the configuration file for Data Protection for mySAP.com to store all variable parameters such as passwords, date of last password change, and the current version number. *path* specifies the full path and the name of the file.

This parameter is required.

**END**

Specifies the end of the parameter definitions. Data Protection for mySAP.com stops searching the file for keywords when END is encountered.

**FRONTEND** pgmname

Specifies a program *pgmname* that is called by Data Protection for mySAP.com in a backup run before the connection to the Tivoli Storage Manager server is established. *pgmname* is either a fully qualified file name or simply a file name. In the latter case the default search path is used to find the program.

If not specified, no front-end processing is done.

**Example (for UNIX):**

FRONTEND write operator@remotesite R3 Backup is starting.

This sends a message to a remote user before backup begins.
LOG_SERVER servername [verbosity]

servername specifies the name of the Tivoli Storage Manager server to send log messages to. The name must match one of the servers listed in a SERVER statement. This parameter must be specified.

verbosity may be any one of the following: ERROR, WARNING, or DETAIL. This value determines which messages are sent. The default value is WARNING, which means that error and warning messages are sent. ERROR sends only error messages. DETAIL sends all message types (errors, warnings, and informational messages).

Note that this feature is available only with Tivoli Storage Manager client and server Version 3 or higher. If there is no LOG_SERVER statement in the profile, log messages are not sent to any of the Tivoli Storage Manager servers.

MAX_SESSIONS n 1

Specifies the total number of parallel Tivoli Storage Manager client sessions that Data Protection for mySAP.com establishes. For a direct backup/restore on tape drives, keep the following in mind: the number of sessions must be less than or equal to the number of tape drives available for the backup. For performance reasons, it is recommended that you use as many parallel sessions as tape drives are available.

Note: Make sure that the mountlimit (mountl) parameter in the device class is set to the number of available tape drives.

If not specified, the default is MAX_SESSIONS 1.

Keep in Mind
The MAX_SESSIONS value must be less than or equal to the sum of the SESSIONS values specified in the SERVER statement(s).

MAX_VERSIONS n 0

n defines the maximum number of database backup versions to be kept in backup storage. The default setting for this value is 0, meaning that versioning is disabled.

PASSWORDREQUIRED NO|YES

Specifies if Tivoli Storage Manager requires a password to be supplied by the Tivoli Storage Manager client. This depends on the Tivoli Storage Manager installation. For more information see the Tivoli Storage Manager administrators manuals.

If not specified the default is PASSWORDREQUIRED YES.

Keep in Mind
This parameter must be defined in conjunction with the respective SERVER statement, as shown in the sample profile.

REDOLOG_COPIES n 1

Specifies the number of copies Data Protection for mySAP.com stores for each processed DB2 log file. If not specified, Data Protection for mySAP.com stores only one copy of each log file.
The number of different BRARCHIVE management classes (keyword BRARCHIVEMGTCLASS) specified must be greater than or equal to the number of log file copies specified.

RL_COMPRESSION NO|YES
If set to YES, Data Protection for mySAP.com performs a null block compression of the data before they are sent over the network. Although RL compression introduces additional CPU load, throughput can be improved when the network is the bottleneck. It is not recommended to use RL compression together with the Tivoli Storage Manager API compression.

If not specified, the default value is NO meaning null block compression is not performed.

RL_COMPRESSION will only be performed if a full database backup was started. The offline log files will not be compressed.

SERVER servername
Denotes the name of the Tivoli Storage Manager server to which a path with the subsequent definitions will be established. For alternate paths, each path must have its own (logical) server name, even if they refer to one and the same real server (same TCP/IP address for all server names). For alternate servers, there must be different TCP/IP addresses for each of the different (real) Tivoli Storage Manager servers.

SESSIONS n\|1
n specifies the number of parallel sessions Data Protection for mySAP.com can start for this server.

If not specified, the default is SESSIONS 1.

This parameter must be defined in conjunction with the respective SERVER statement, as shown in the sample profile.

SNMPTRAP hostname community level
hostname specifies the name of the machine to which the log messages are to be sent. This field must be specified.

community is the first level that filters messages. You can define your own community.

level may be one of the following: ERROR, WARNING, or DETAIL. This value determines which messages are sent. ERROR sends only error messages, WARNING sends error and warning messages, and DETAIL sends all message types (errors, warnings and informational messages). The default is WARNING.

TRACE FILEIO_MIN | FILEIO_MAX | COMPR_MIN | COMPR_MAX | MUX_MIN | MUX_MAX | TSM_MIN | TSM_MAX | ASYNC_MIN | ASYNC_MAX | APPLICATION_MIN | APPLICATION_MAX | SYSCALL_MIN
If the parameter TRACE is specified, Data Protection for mySAP.com writes a trace to the file specified with the parameter TRACEFILE. Arguments to TRACE can be any combination of the possible components and levels separated by spaces.

Note
Do not use this parameter unless your Data Protection for mySAP.com support asks you to. Using it can significantly degrade the performance of Data Protection for mySAP.com.

A trace will only be written if both TRACE and TRACEFILE are specified.

TRACEFILE path
Specifies the trace file for Data Protection for mySAP.com to store all trace information (if TRACE ON), path specifies the full path and the name of file.

Note: In an actual trace the string %BID will be replaced by the Backup ID.

A trace will only be written if both TRACE and TRACEFILE are specified.

USE_AT days
Specifies on which days this Tivoli Storage Manager server will be used. The days are numbered from 0 (Sunday) to 6 (Saturday).
If not specified, the default is to use the Tivoli Storage Manager server on all days.

Keep in Mind
This parameter must be defined in conjunction with the respective SERVER statement, as shown in "EXAMPLE 3: Use of Alternate/Parallel Servers for Disaster Recovery" on page 80. The parameter USE_AT has no effect on actions other than backup.

Sample Data Protection for mySAP.com Profile for UNIX

This sample profile (initSID.utl) is included in the Data Protection for mySAP.com installation package. The UNIX and Windows versions are identical except for small differences due to naming conventions. Therefore, only the UNIX version is shown here.

#-----------------------------------------------------------------------------------
# # Data Protection for mySAP.com(R) technology interface for DB2 UDB # # Sample profile for Data Protection for mySAP.com(R) technology # Version 3.3 for UNIX # #-----------------------------------------------------------------------------------
# # See the 'Data Protection for mySAP.com(R) technology Installation & # User's Guide' for a full description.
#
For comment symbol the character '#' can be used.
Everything following this character will be interpreted as comment.

Data Protection for mySAP.com(R) technology V3R3 accesses its profile
in "read only" mode only. All variable parameters like passwords, date of
last password change, current version number will be written into the file
specified with the CONFIG_FILE parameter. The passwords will be encrypted.

Prefix of the 'Backup ID' which will be stored in the description field
of the Tivoli Storage Manager archive function.
Maximum 6 characters.
Default: none.

BACKUPIDPREFIX SID___

Number of parallel sessions to be established.
Note: this number should correspond with the number of simultaneously
available tape drives specified for the Tivoli Storage Manager server.
Default: none.

MAX_SESSIONS 1 # 1 Tivoli Storage Manager client session is default

Number of backup copies of the DB2 log files.
The valid range of REDOLOG_COPIES is from 1 to 9.
Default: 1.

REDOLOG_COPIES 2 # 1 is default

Specifies the block size for disk I/O (in bytes). The valid range is
from 4 KB to 32 MB.
The default values have been chosen from our performance experiments in
standard hardware environments.
Default: 131072 (128 KB) on UNIX, 32768 (32 KB) on Windows NT.
BUFFSIZE 131072 # block size in bytes

Maximum number of data base backup versions to be kept.
Note: Version control by Data Protection for mySAP.com(R) technology is
only activated if the parameter MAX_VERSION is not 0.
The valid range of MAX_VERSIONS is from 0 to 9999.
Default: no versioning.

MAX_VERSIONS 4

Specifies whether a null block compression of the data is to be performed
before transmission to Tivoli Storage Manager.
Although RL compression introduces additional CPU load, throughput can be
improved when the network is the bottleneck. RL compression in Data
Protection for mySAP.com(R) technology should not be used together with
Tivoli Storage Manager API compression.
Default: NO

RL_COMPRESSION YES # NO is default

Controls generation of a trace file.
Note: we recommend using the trace function only in cooperation with
the hotline.
Default: OFF
#TRACE OFF
#TRACEFILE /db2/C21/sqlib/log/tdpr3.trace

# Specify the full path of the configuration file.
# Default: none.
#
#CONFIG_FILE /db2/C21/sqlib/initSID.bki

# Denotes if Data Protection for mySAP.com(R) technology shall send
# error/status information to a Tivoli Storage Manager server.
# The servername must match one of the servers listed in a SERVER statement.
# Values for verbosity can be ERROR, WARNING, or DETAIL.
# Default: none.
#
#LOG_SERVER servername [verbosity]
#LOG_SERVER server_a ERROR

# Denotes if Data Protection for mySAP.com(R) technology shall send
# error/status information to a network management program via SNMP traps.
# Default: none.
#
#SNMPTRAP Hostname community level
#SNMPTRAP server_a public detail

# Statement for multiple Servers and multiple Paths.
# may be used multiple times (one for each server).
#
SERVER server_a # Servername
SESSIONS 2 # Max sessions
PASSWORDREQUIRED YES # Use a password
ADSMNODE NODE # Tivoli Storage Manager Nodename
BRBACKUPMGTCLASS MDB # Mgmt-Classes
BRARCHIVEMGTCLASS MLOG1 MLOG2 # Mgmt-Classes
# USE_AT 0123456 # Days for backup

SERVER server_b # Servername
SESSIONS 2 # Max sessions
PASSWORDREQUIRED YES # Use a password
ADSMNODE NODE # Tivoli Storage Manager Nodename
BRBACKUPMGTCLASS MDB # Mgmt-Classes
BRARCHIVEMGTCLASS MLOG1 MLOG2 # Mgmt-Classes
# USE_AT 0123456 # Days for backup

# USE_AT : 0=Su 1=Mo 2=Tu 3=We 4=Th 5=Fr 6=Sa
# Default: all days
#
# End of profile

END
Appendix E. Sample Tivoli Storage Manager Profiles (UNIX)

Client User Options File Sample (dsm.opt)

************************************************************************
* Tivoli Distributed Storage Manager *
* Sample Client User Options file for AIX and SunOS *
************************************************************************

S ervername server_a
T apeprompt No
D O M /usr/sap /sapmnt/C21 /usr/sap/trans /db2/C21

Client System Options File Sample (dsm.sys)

************************************************************************
* Tivoli Distributed Storage Manager *
* Sample Client System Options file for AIX and SunOS *
************************************************************************

S ervername server_a
C O M Mmethod TCPip
TCPPort 1500
TCPServeraddress loopback
TCPBuffsize 32
TCPWindowSize 24
Compression Off
InclExcl /usr/lpp/tsm/bin/inclexcl.sample

Include/Exclude List Sample

************************************************************************
* incl/excl.list: *
* Sample include/exclude list *
************************************************************************

* Task:
* Include/Exclude list of files and directories for TSM incremental backups
*
* ***** NOTE ***** NOTE ***** NOTE *****
* This file is intended only as a model and should be
* carefully tailored to the needs of the specific site.
* ***** NOTE ***** NOTE ***** NOTE *****
* For all UNIX systems
* exclude /unix
exclude /.../core
exclude /u/.../*sh_history
exclude /home/.../*sh_history
* Note: It is recommended to perform system backups on a regular
* basis. Consequently, you can exclude at least the following
* directories:
* exclude /usr/games/.../*
exclude /usr/bin/.../*
exclude /usr/bin/.../*
exclude /usr/m/bin/.../*
exclude /usr/sbin/.../*
* For those using AFS, exclude the cache filesystem or file
*
* exclude /usr/vice/cache/*
* exclude /var/vice/cache/*
* or
* exclude /afscfs

* This stuff is either not worthwhile to be included or should be backed up
  using DB2 backup techniques and the SAP utility brarchive.

* exclude /db2/C21/log_archive/C21/*
* exclude /db2/C21/sapreorg/*/* (There may be important scripts
  located, check it out and decide.)
* exclude /db2/C21/sapdata/*/*
* exclude /db2/C21/sapraw/*/*

* With the above include/exclude list we implicitly include everything not
  excluded above. Especially for mySAP.com(R), this means including:
  * /sapmnt/C21  > 300 MB
  * /usr/sap    > 50 MB
  * /db2/C21    > 200 MB
  * and UNIX related  > 350 MB

*
Appendix F. Sample Tivoli Storage Manager Profiles
(Windows)

Client User Options File Sample (dsm.opt)

The Tivoli Storage Manager client programs require a file dsm.opt containing standard client user options. The full file name is set in the environment variable DSM_CONFIG. This file is not provided with the installation.

*************************************************************************
* DSM.OPT (for Data Protection for mySAP.com(R) technology)
* Data Protection for mySAP.com(R) technology requires that a file
* 'dsm.opt' is present, although its contents are ignored.
* This means that this file may be empty (like this file).
* The information about a Tivoli Storage Manager server
* is obtained from the corresponding client option file <server>.opt.
* Data Protection for mySAP.com(R) technology inspects the environment
* variable DSMI_CONFIG to obtain the full file name of 'dsm.opt'.
* Note: The standard Tivoli Storage Manager client programs also use a file
* 'dsm.opt', but the full file name of this client user option file is set
* in the environment variable DSM_CONFIG.
* This file is called the Tivoli Storage Manager client user option file.
* Please see the Tivoli Storage Manager documentation for details.
*************************************************************************

Client Options Files Sample (<server>.opt)

Data Protection for mySAP.com requires for each Tivoli Storage Manager server a corresponding client option file <server>.opt. All these files must reside in one directory, and this directory must contain a file dsm.opt whose full file name is set in the environment variable DSMI_CONFIG. The contents of this (second) dsm.opt file is ignored by Data Protection for mySAP.com.

*************************************************************************
* SERVER.OPT
* Data Protection for mySAP.com(R) technology obtains the necessary
* information about a Tivoli Storage Manager server 'server' from a
* client option file called '<server>.opt'.
* For each Tivoli Storage Manager server a corresponding client option file
* is required.
* Note: This file contains the client options for the Tivoli Storage Manager
* server called 'server_a'.
* Please see the Tivoli Storage Manager documentation for details.
*************************************************************************

COMMmethod TCP1P
SLOWINCR NO
COMPresison OFF
NODEname C21
TCPPort 1500
TCPServeraddress xxx.xxx.xxx.xxx
PASSWORDACCESS PROMPT
TCPBUFFSIZE 31
TCPWINDOWSIZE 32

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This sample include/exclude list is intended for the standard client user option file. The idea is to exclude files from ordinary Tivoli Storage Manager incremental backups that are easy to restore or that are already saved by Data Protection for mySAP.com. Mainly such files are Windows system files and DB2 database files.

*************************************************************************
* This Include-Exclude list is used for incremental backups of file
* systems by the Tivoli Storage Manager command-line backup client.
* Therefore the name of this file has to be set under the keyword InclExcl
* in the standard Tivoli Storage Manager client user option file "dsm.opt".
* Since the backup of the DB2 database is done by
* Data Protection for mySAP.com(R) technology and not by Tivoli Storage
* Manager command-line backup client, the DB2 database should be excluded
* from backups by the Tivoli Storage Manager command-line backup client.
* Note 1:
* The environment variable DSM_CONFIG contains the full file name of
* the Tivoli Storage Manager client user option file "dsm.opt".
* Note 2:
* This Include-Exclude is not used by Data Protection for mySAP.com(R)
* technology.
*************************************************************************

Exclude *.swp
Exclude *.obj
Exclude *.csm
Exclude *.dsk
Exclude *.bak
Exclude \win386*.swp
Exclude \386spart.par
Exclude \pagefile.sys
Exclude *.par
Exclude \IBMBIO.COM
Exclude \IBMDOS.COM

* Exclude the following DB2 database files:
  Exclude \saparch\*
  Exclude \sapbackup\*
  Exclude \sapreorg\*
  Exclude \sapdata\*
Appendix G. Sample DB2 Vendor INI File

During installation, a DB2 Vendor INI file is created from the information entered in the installation dialog panels. This file is pointed to by the DB2 profile registry variable DB2_VENDOR_INI.

A sample DB2 Vendor INI file (vendor.env) is included in the Data Protection for mySAP.com installation package.

Note

Ensure that there are no blanks within the paths specified for the vendor-specific environment variables of the DB2_VENDOR_INI file. DB2 is currently unable to handle embedded blanks. Note that in the case of a standard Windows installation, the Data Protection for mySAP.com profile is located at c:\Program Files\Tivoli\tsm\tdp_r3\initSID.utl

This is a sample DB2 Vendor INI file for UNIX:

XINT_PROFILE=/usr/tivoli/tdp_r3/db2/initSID.utl
TDP_DIR=/usr/tivoli/tdp_r3/db2/log

This is a sample DB2 Vendor INI file for Windows:

XINT_PROFILE=c:\sql\lib\tdp_r3\initSID.utl
TDP_DIR=c:\sql\lib\tdp_r3\log
Appendix H. Elements of Backup Schedules (UNIX)

Under UNIX, crontab starts jobs (cron.job) at predefined times. In the example below, crontab starts a shell script, backup.ksh, which simply uses the DB2 backup command to save the data.

Crontab File Sample

```
# crontab.sample:
# Sample crontab file to be included in the root crontab jobs.
# Task:
# Submits backup commands at regularly scheduled intervals
# using a simple shell script containing SAP backup commands.
# ***** NOTE ***** NOTE ***** NOTE *****
#       This file is intended only as a model and should be
#       carefully tailored to the needs of the specific site.
#       ***** NOTE ***** NOTE ***** NOTE *****
#
# Remarks on the crontab file format:
# Each crontab file entry consists of a line with six fields, separated
# by spaces and tabs, that contain, respectively:
#  o The minute (0 through 59)
#  o The hour (0 through 23)
#  o The day of the month (1 through 31)
#  o The month of the year (1 through 12)
#  o The day of the week (0 through 6 for Sunday through Saturday)
#  o The shell command
# Each of these fields can contain the following:
#  o A number in the specified range
#  o Two numbers separated by a dash to indicate an inclusive range
#  o A list of numbers separated by commas
#  o An * (asterisk); meaning all allowed values
#
# For the following examples, the system ID of the DB2 database
# is assumed to be "C21" and the username "db2C21".
#
# Full database backup, scheduled every Friday at 8:00 p.m.
# 0  2 * * 5 /usr/bin/su - db2C21 -c "/db2/C21/sapscripts/backup/backup.ksh"
```

Full Offline Backup Shell Script Sample

```
#!/bin/ksh
# backup.ksh:
# Sample backup shell script
# Task:
# Invokes the DB2 backup command in order to perform a full offline
# backup of all table spaces
```
# using IBM's SAP R/3 Tivoli Storage Manager interface program
# Data Protection for mySAP.com.
# --------------------------------------------------------------------------
# ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
# This script is intended only as a model and should be
carefully tailored to the needs of the specific site.
# ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
# --------------------------------------------------------------------------
# For the following examples, the system ID of the DB2 database
# is assumed to be "C21".
# --------------------------------------------------------------------------
# First, lets do a full offline backup of the DB2 database. This includes
# at least files located in the following file systems:
# /db2/C21/sapdata1
# /db2/C21/sapdata2
# /db2/C21/sapdata3
# /db2/C21/sapdata4
# /db2/C21/sapdata5
# /db2/C21/sapdata6
# --------------------------------------------------------------------------
# COMMAND-----------------------------------

db2 backup db C21 load /usr/tivoli/tsm/tdp_r3/libtdpdb2.a
Appendix I. Elements of Backup Schedules (Windows)

To start jobs on a Windows system at predefined times, it is necessary to have the Schedule service running. It is started with:

```
net start schedule
```

After the Schedule service is running, jobs are scheduled with the `at` command. In the following example, the job `backup.cmd` is started. It simply uses the DB2 backup command to save the data.

### Schedule Batch Sample

```batch
@echo off
rem ------------------------------------------------------------------------
rem file name: schedule.sample
rem ------------------------------------------------------------------------
rem Task: Submits a backup command at regularly scheduled intervals
rem using a simple batch file containing a SAP backup command.
rem ------------------------------------------------------------------------
rem ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
rem rem This file is intended only as a model and should be
rem carefully tailored to the needs of the specific site.
rem rem ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
rem rem For a full reference of the AT command please see the Windows
rem rem help.
rem rem ------------------------------------------------------------------------
rem rem For the following examples, the system ID of the DB2 database
rem rem is assumed to be "C21".
rem rem ------------------------------------------------------------------------
rem rem Full database backup, scheduled every Friday at 8:00 p.m.
rem rem at 20:00 /every:f cmd /c c:\db2\C21\sapscripts\backup\backup.cmd
rem rem --------------------- end of schedule.sample ------------------------
```

### Full Offline Backup Batch File Sample

```batch
@echo off
rem Full Offline Backup batch file:
rem ------------------------------------------------------------------------
rem file name: backup.cmd
rem ------------------------------------------------------------------------
rem Sample backup batch file
rem ------------------------------------------------------------------------
rem Task: Invokes the DB2 backup command in order to perform a full offline
rem backup of all tablespaces using IBM's SAP R/3-Tivoli Storage Manager
rem interface program Data Protection for mySAP.com.
rem ------------------------------------------------------------------------
rem ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
rem rem This script is intended only as a model and should be
rem carefully tailored to the needs of the specific site.
rem rem ***** NOTE ***** NOTE ***** NOTE ***** NOTE *****
rem rem For the following examples, the system ID of the DB2 database
rem rem is assumed to be "C21".
rem rem
```

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rem First, let's do a full offline backup of the DB2. This
rem includes at least files located in the following file systems:
rem c:\db2\C21\sapdata1
rem c:\db2\C21\sapdata2
rem c:\db2\C21\sapdata3
rem c:\db2\C21\sapdata4
rem c:\db2\C21\sapdata5
rem c:\db2\C21\sapdata6
rem
rem ------------------------------COMMAND-----------------------------------

db2 backup db C21 load "c:\Program Files\Tivoli\TSM\TDP_R3\tdpdb2.dll"
Appendix J. Installation Planning Sheet

Before starting the installation procedure, collect the following information:

DB2 UDB database SID:

---

Path where the DB2 UDB executables reside:

---

TSM server name:

---

TSM node name:

---

TSM management classes for database and log file backups:

---

For Windows only: Path where the Tivoli Storage Manager API resides (contents of environment variable DSMI_DIR):

---

For Windows only: Option file of Tivoli Storage Manager (contents of environment variable DSMI_CONFIG):

---

For Windows only: Path for Tivoli Storage Manager log files (contents of environment variable DSMI_LOG):

---

For Windows only: Installation path for Data Protection for mySAP.com technology executables:

---

Path for Data Protection for mySAP.com technology configuration files:

---

Administration Assistant Server for Data Protection for mySAP.com:

---
Glossary

A

**Activate**. The process of validating the contents of a policy set and copying the policy set to the ACTIVE policy set.

**Active policy set**. The policy set that contains the policy rules currently in use by all client nodes assigned to the policy domain. The active policy set is the policy set that was most recently activated for the policy domain.

**Administration Assistant**. A Web browser based graphical interface to support and assist the customizing of Data Protection for mySAP.com (System Configuration) and the analyzing of mySAP.com database backup and restore operations (Operations Monitor, Performance Monitor).

**Administrative client**. In Tivoli Storage Manager, a program that runs on a file server, workstation, or mainframe that allows administrators to control and monitor the Tivoli Storage Manager server through administrator commands. Compare with backup-archive client.

**Archive copy group**. A policy object containing attributes that control the generation, destination, and expiration of archive files. An archive copy group belongs to a management class.

B

**Backup-archive client**. A program that runs on a workstation or file server and provides a means for users to back up, archive, restore, and retrieve files. Compare with administrative client.

**Backup copy group**. A policy object containing attributes that control the generation, destination, and expiration of backup files. A backup copy group belongs to a management class.

**Backup Object Manager**. A utility for querying, restoring, and deleting backup objects on TSM.

**BRARCHIVE**. An SAP administration tool to perform backups of offline log files in an mySAP.com DB2 UDB database environment.

**BRRESTORE**. An SAP administration tool to perform a restore of previously backed up offline log files in an mySAP.com DB2 UDB database environment.

C

**Client options file**. A file that a client can change, containing a set of processing options that identify the server, communication method, and options for backup, archive, hierarchical storage management, and scheduling. It is also called dsm.opt file.

**Client system options file**. A file, used on UNIX clients, containing a set of processing options that identify the Tivoli Storage Manager servers to be contacted for services. This file also specifies communication methods and options for backup, archive, hierarchical storage management, and scheduling. It is also called dsm.sys file.

**Command Line Processor (CLP)**. A character based interface for entering SQL statements and database manager commands (e.g. backup or restore).

**Control Center**. A graphical interface that shows database objects (such as databases and tables) and their relationship to each other. The Control Center allows administrative tasks (e.g. database backup) provided by the DBA utility to be performed and provides visual explanation and performance monitor tools.

**Copy group**. A policy object that contains attributes that control the generation, destination, and expiration of backup and archive files. There are two kinds of copy groups: backup and archive. Copy groups belong to management classes.

D

**Data block**. The smallest unit of a database

**Device class**. A named group of storage devices with common characteristics. Each device class has a unique name and represents a device type of disk, file, optical disk, or tape.

**DISK**. A device class that is defined by Tivoli Storage Manager at installation. It is used to categorize disk drives, such as internal disk drives.

F

**File space**. A logical space in a client’s storage that can contain a group of files. Clients can restore, retrieve, or delete their file spaces from Tivoli Storage Manager server storage. Tivoli Storage Manager does not necessarily store all the files from a single file space.
together, but can identify all the files in server storage that came from a single file space.

Include/exclude list. A group of include and exclude option statements in a file. Tivoli Storage Manager uses the statements to determine whether to back up or migrate certain files, and to determine the associated management classes to use for backup, archive, and space management. The exclude options identify files that should not be backed up or migrated off the client node. The include options identify files that are exempt from the exclusion rules, or assign a management class to a file or group of files for backup, archive, or space management services. The include/exclude list is defined either in an include/exclude file (for UNIX clients) or in the client options file (for other clients).

Management class. A policy object that users can bind to each file to specify how the server manages the file. The management class can contain a backup copy group, an archive copy group, and space management attributes. The copy groups determine how the Tivoli Storage Manager server manages backup versions or archive copies of files. The space management attributes determine whether files are eligible for migration from space manager client nodes to Tivoli Storage Manager storage, and under what conditions.

Node. A unique name used to identify a server/workstation (client) to the Tivoli Storage Manager server.

Offline log file. A log file that has been copied by the DB2 user exit to the directory 'log_archive'. It is no longer needed by the database for rollback operations or a crash recovery. Nevertheless, it must be copied back to directory 'log_dir' if a rollforward recovery is to be done.

Online active log file. Log file which is currently being used by DB2 to log transactions. It is needed for rollback operations and crash recovery.

Online retained log file. The log file is no longer being used, but it contains transactions with data pages that have not yet been written from the buffer pool to disk. Nevertheless, the DB2 logging user exit will be issued by DB2 (if configured), which copies a filled or closed online retained log file to the 'log_archive' directory. Online retained log files will be deleted if they are no longer needed by DB2 because all referenced transactions are committed and all changed pages have been written to disk. Also, the DB2 user exit must have been successful in copying the log files into the 'log Archive' directory.

Policy domain. A policy object that contains policy sets, management classes, and copy groups that are used by a group of client nodes.

Policy set. A policy object that contains a group of management class definitions that exist for a policy domain. At any one time there can be many policy sets within a policy domain but only one policy set can be active.

Recovery History File. A recovery history file is created with each DB2 database and is automatically updated, for example, whenever one of the following operations is performed:
• Backup of a database or tablespace
• Restore of a database or tablespace
• Rollforward of a database or tablespace
• Alter of a tablespace
• Load of a table
• Drop of a table
• Reorganization of a table
• Update of table statistics

Every DB2 backup operation includes a copy of the recovery history file.

Retention. The amount of time, in days, that inactive backed up or archived files are kept in the storage pool before they are deleted. Copy group attributes and default retention grace periods for the domain define retention.

Scratch volume. A volume that is available for Tivoli Storage Manager use. The volume is either labeled, or blank or contains no valid data, and is not defined to Tivoli Storage Manager.

Storage pool. A storage pool is a named collection of storage volumes that are associated with one device class. Each storage pool represents a collection of volumes that are the same media type. For example, a storage pool that is associated with a device class for 8 mm tape contains only 8 mm tape volumes.

Tablespace. An abstraction of a collection of containers into which database objects are stored. A
tablespace provides a level of indirection between a database and the tables stored within the database.

**Tablespace container.** A generic term describing an allocation of space to a tablespace. Depending on the tablespace type, the container can be a directory, device, or file.

**Tivoli Storage Manager.** A client/server program that provides storage management to customers in a multivendor computer environment.

**Tivoli Storage Manager API.** A set of functions that applications running on a client platform can call to store, query, and retrieve objects from Tivoli Storage Manager storage.

**U**

**User exit.** The DB2 database manager can call a user exit program to store and retrieve log files and manage the location of archived log files, if the database configuration parameter ‘userexit’ is activated. Using a user exit program to archive and retrieve log files enables the database for rollforward recovery.

**V**

**Validate.** The process of ensuring that the active policy set contains a default management class and reports on copy group definition errors.

**Vendor API.** An interface provided by DB2 to which vendors are able to write compatible software libraries, which should be shared libraries. Thus, the DB2 UDB process is able to issue commands to the Vendor API to write backup data to sequential storage (e.g., Tivoli Storage Manager) and read files from sequential storage.

**Volume.** The basic unit of storage for the Tivoli Storage Manager database, recovery log, and storage pools. A volume can be an LVM logical volume, a standard file system file, a tape cartridge, or an optical cartridge. Each volume is identified by a unique volume identifier. See database volume, scratch volume, and storage pool volume.
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Complete □ □ □ □ □
Easy to find □ □ □ □ □
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