

# SEPsesam Administrator Manual

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March 11, 2004

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### **Hint**

This administrator manual is based on **SEPs sesam** user manual, ie. the basic description of functionality is not repeated here.

This manual is to support the administrator during installation, starting, configuring and problem-free upkeep of the **SEPs sesam** software.

This document is kept under CVS identification:

`$Id: admin_manual.tex,v 1.16 2004/03/11 11:48:15 sesam Exp $`

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# Chapter 1

## Introduction

### 1.1 Storage Management

Storage or data management is based on 5 main items:

Availability of data
Security of data
Backup of data
Restore of data
Disaster recovery

The explicit destination of **SEP AG** is to integrate all 5 items into customer's storage concepts.

#### 1.1.1 Availability of Data

The goal of every data management is the permanent availability of company relevant information. In an environment, where times to react decrease more and more, a loss of data can cause severe and often very expensive problems.

The nowadays existing large amounts of data demand a lot of time for maintenance and support, which should be minimized by an optimal data management.

The user wants to get its data fast and always.

#### 1.1.2 Security of Data

Using security techniques like encryption, support of firewalls and secure shell, prevent misuse and violation of data.

#### 1.1.3 Backup of Data

Only a backup without interruption provides cover from loss of important data. The installed systems should be easy to use and able to work in an environment of heterogeneous operation systems.

### 1.1.4 Restore of data

During restore, the data are copied from the backup media to the original source or new targets.

### 1.1.5 Disaster Recovery

In case of disaster recovery the totally lost data should be restored as quick as possible. Fire damage, assaults or natural disaster are examples that cause total loss of data.

## 1.2 Objects of SEPsesam

To make it easy to understand and configure the software an object oriented approach using following 6 basic components was chosen:

- **Drive**  
**Drives** are devices which write data on media. They may be connected to **SEPsesam** host (local drive) or to other computers reachable over net (remote drive). Normally tape devices writing on removable tape cartridges are used.  
DISK-drives are a special thing, because they are not real devices, but are built by directories on disks.
- **Loader**  
**Drives** may be installed into **loaders**, which are able to move **media** from a magazine into drive and vice versa. Thus fully automatic operation of the backup system during nights and weekends is possible.
- **Client**  
**Clients** are computers in net, whose data have to be backed up.
- **Media**  
**Media** are removable data carrier, where the copied data are stored for cases of data-loss or damage.
- **Task**  
A **task** makes up a description of a backup or a restore. Here data source, target, type of backup or restore etc. are denoted.
- **Appointment**  
Time control of **SEPsesam** is performed through schedules, i.e. all activities are entered into a central appointment calendar and a program - the so called SEPuler - , which ensures that these appointments are executed at the right time.

## Chapter 2

# Installation

### 2.1 Directory structure

During unpacking the **SEPs** **sesam** Software the following directory structure is created (Installation Directory **ID**) :

ID/skel	Template-Files incl. raw database for the first installation
ID/bin/sesam	Sesam Server-components
ID/bin/sms	sms- and stpd-components
ID/bin/gui	Sesam Server Gui-components (GraphicalUserInterface)
ID/bin/db	Sesam Server database-components

During Setup the following directory structure is created, whereby the Installation directory ID must not correspond to the directory, mentioned above:

ID/var/ini	Initialization files
ID/var/log	Log- resp. Trace-main directory
ID/var/tmp	Short-term temporary files
ID/var/work	Medium-term temporary files
/etc/sesam2000.ini      resp. HKEY_LOCAL_MACHINE/ SOFTWARE/SEP      Elek- tronik GmbH/sesam	links to the paths of the most important ini-Files

**/var/ini** contains the following initialization files:

debug.ini	Logging configuration sesam kernel
openrda.ini	sesam db (open Access)
sm.ini	sesam configuration (Paths etc.)
sms.ini	SMS Server configuration (Paths etc.)
stpd.ini	STPD Server configuration (Paths etc.)

After the installation the access to directories ID/skel and ID/bin can be set to Read-Only.

## 2.2 sm\_setup

### Description

Program for component installation resp. -deinstallation.

Except that it offers the possibility to create or modify files, modify and read the Windows Registry and an accumulative copy function.

### Command reference

The sequence of parameters must be observed.

The Installation directory for the variable data under ID/var can be changed with the optional Argument `var=vardir`.

The following calls must be executed in `{ID}/bin/sesam`.

**Installation of a Server** `sm_setup make_srv [var=vardir]`

#### Hint:

At a server installation, a client and a tape server are created as well.

**Installation of a Tape Server** `sm_setup make_node {SesamServer} [var=vardir]`

**Installation of a graphical interface** `sm_setup make_gui {sesamserver} [var=vardir]`

**Installation of a client** `sm_setup make_client {sesamserver} [var=vardir]`

### Deinstall a SEPs sesam Product

`sm_setup delete`

### Change of the SEPs sesam configuration:

#### Make possible GUI access from another computer

`sm_setup allow_gui {gui} {user}`

#### Assign another server to the GUI (Execution at the GUI client)

`sm_setup set_gui {sesamserver}`

#### Set Reboot-Script for the client or the server

`sm_setup set_reboot client—server—set_reboot_script`

#### Allow access for a server to the client (Entry at the client)

`sm_setup set_client {sesamserver}`

### Example

`sm_setup allow_gui pc21 admin`

### Usage of sm\_setup for Installation and Update:

Requirements : Own directory with the packed kit, `sm_setup` and (if available) the `unzip` - Tool

Call `sm_setup` without parameters

## 2.3 Installation on UNIX and LINUX

### 2.3.1 UNIX Backup Server

#### 2.3.1.1 Software-Requirements

- The server must be able to resolve the client and vice versa
- The client and tapeserver do not need JRE (Java Runtime Environment)
- SUN Java Runtime Environment (JRE) 1.3 or higher
- CLCMC314 SCSI CAM Media Changer Driver V3.10 for Loader (Tru64 Unix only)
- Acrobat Reader higher/equal 4.0
- Working name resolution IP names and addresses (correct DNS, or proper entries in /etc/hosts)

#### Supported operating systems:

*Operating system: Version / Service Pack:*

- LINUX I386/IA64
- Solaris
- Compaq UNIX, Tru64 from 4.0x

#### Shared loaders/Tape drives:

All loaders with SCSI-interface and all DAT, LTO, AIT, SUPER DLT and DLT- drives are supported.

#### 2.3.1.2 Installation

1. Login under user "root"
2. Prepare for reading the CD-ROM-drive from the operating system of the server.
3. The SUN JRE is necessary, because it contains a JDBC-ODBC Bridge, which is used by the SEPsesam GUI RMI Server. If there is no SUN-JRE (pre-installed as Standard Java), it can be also loaded from the **SEPsesam** CD - subdirectory "utils" in the corresponding directory with the operating system used. The files residing there (whose names contain "jre"), are either Shell - Scripts (\*.sh), executables or RPM - Packages (\*.rpm).

Shell - Scripts are executed with `sh -x jre*.sh`.

Executables can be directly executed from the command line.

RPM - Packages are started with `rpm -ivh *.rpm`

Attention: The location where JRE was installed is to be determined. If there is no other active Java - installation in the system, it can be recommended to make that globally available in the system using a link.

### Example

The just installed java can be defined with

```
ln -sf 6/usr/lib/jre130/bin/java /usr/bin/java
```

as Standard-Java Interpreter or the PATH-variable can be set prior to the installation so, that this version of JRE will be used for the installation of **SEPs**sesam.

4. Installation of Server/Tapeserver/Client under Linux/Unix with the help of sm\_setup:

```
cd {CDROM - Path}/{Folder with operating system}
```

```
'sm_setup
```

Upon problems with the installation the delivered unzip tool should be taken from folder `''utils''` and made available to sm\_setup (Extend the path variable or put in the same folder)

Then the instructions of sm\_setup should be followed.

Finally the user interface is started with

```
{ID}/bin/gui/sesam2000.gui.sh
```

### Hints

- We must be sure before the start of the **SEPs**sesam User Interface (GUI), that we use the right JRE.
- The SEPs sesam Server state can be checked in `{ID}/bin/sesam` with:  
`./sm_main status`  
and in case of non-activity the SEPs sesam Server is initiated with  
`./sm_startup`

- Stop the **SEPs**sesam Server with  
`{ID}/bin/sesam/sm_os_startup stop`

Stop the **SEPs**sesam Tapeserver with  
`{ID}/bin/sesam/sm_main stop`

Stop the **SEPs**sesam client with  
`{ID}/bin/sesam/sm_main stop`

## 2.3.2 UNIX Client

The server must be able to resolve the client and vice-versa.

This can be checked with ping, nslookup and sm\_ctrlc. If these commands show errors, they should

## 2.3. INSTALLATION ON UNIX AND LINUX

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be fixed prior to the connection of the computer to the **SEPs**sesam Server. The functionality of **SEPs**sesam-Software is basically dependent on a correct network installation.

Installation with  
`sm_setup make_client {SesamServer}`(see 2.2)

### 2.3.3 UNIX Tape Server

A Tape Server is a Client with extensions for the connection of RemoteDrive resp. RemoteLoader (see 2.3.2).

`sm_setup make_node {SesamServer}`(see 2.2)

### 2.3.4 UNIX Interface (GUI)

**Requirement:** Java Runtime Environment (JRE) 1.3 or higher

The operating system must have access to the **SEPs**sesam-CD.  
Then you go to the directory, which corresponds to the respective UNIX operating system. The GUI installation is possible only if there is a Server-Kit. The dialogs of `sm_setup` offer the possibility of a GUI-Installation.

`sm_setup make_gui {SesamServer}`(see 2.2)

The access rights of the GUI-computer to the **SEPs**sesam Server are defined on the server side in the file `{IV}/var/ini/sm_java.policy`.

A corresponding entry can be created **on the server side** with the following call:

`sm_setup allow_gui {gui} {user}`

Example `sm_java.policy` - Linux/Unix/Tru64-Version

```
// GENERATED sm_java.policy BY sm_setup $Id: setup.c,v 1.80.2.1 2002/08/20
06:39:48 sesam Exp $ FOR VERSION 2.0.1.31
```

```
// DO NOT CHANGE FORMAT DURING EDITING LINES
```

```
grant
{
    // ACCESS
    permission java.security.AllPermission;

    // NET
```

```
permission java.net.SocketPermission "*:11401", "connect,accept,resolve";
permission java.net.SocketPermission "*:11301", "connect,accept,resolve";
permission java.net.SocketPermission "*:21", "connect,accept,resolve";
permission java.net.SocketPermission "*:25", "connect,accept,resolve";
permission java.net.SocketPermission "127.0.0.1:*",
"connect,accept,resolve";
    permission java.net.SocketPermission "qslinux2:*",
"connect,accept,resolve";

// ETC
permission java.util.PropertyPermission "user.dir", "read";
permission java.util.PropertyPermission "user.name", "read";
permission java.util.PropertyPermission "file.encoding", "read";
permission java.util.PropertyPermission "java.rmi.server.hostname",
"read";
    permission java.util.PropertyPermission "*", "read,write";
    permission java.lang.RuntimePermission
"accessClassInPackage.sun.jdbc.odbc";
    permission java.lang.RuntimePermission "loadLibrary.JdbcOdbc";
    permission de.sep.sesam.gui.server.RestorePermission "*@*";
    permission de.sep.sesam.gui.server.OperatorPermission "*";
    permission java.sql.SQLPermission "setLog";

// FILE
permission java.io.FilePermission "/etc/sesam2000.ini", "read";
permission java.io.FilePermission "/sesam/var/-", "read,write";
permission java.io.FilePermission "JdbcOdbcSecurityCheck", "write";
permission java.io.FilePermission "<<ALL FILES>>", "execute";

};
```

### 2.3.5 Deinstallation Server, Tapeserver, Client, GUI-Client

```
cd {ID}/bin/sesam
```

```
sm_setup delete
```

### 2.3.6 Set SEPs sesam Environment on UNIX

For the execution of SEPs sesam Programs the environment variables (PATH, LD\_LIBRARY\_PATH, OPENRDA\_INI, ...) should be set. They should be set with the available profile ID/var/ini/sesam2000.ini.

#### Procedure

At the server go to the Terminal-level and enter

## 2.3. INSTALLATION ON UNIX AND LINUX

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**cat /etc/sesam2000.ini** (Command)

Under SM.INI cut the Path of the **IDry** and with

**cd {IV}/var/ini** (Command)

change to the ini-directory

Apply the settings from sesam2000.profile with

**./sesam2000.profile** (Command, important is the space between the dots)

Example for the Profile:

```
# GENERATED sesam.profile
#
# sesam2000 environment variables
sesam2000=/opt/sesam/var/ini
sesam_db=/opt/sesam/var/db
OA_ROOT=$sesam_db
OPENRDA_INI=/opt/sesam/var/ini/openrda.ini
SESAM_ROOT=/opt/sesam/bin/sms
LANG=de_DE.ISO8859-1
PATH=$PATH:$sesam2000:/opt/sesam/bin/sesam:/opt/sesam/bin/sms:/opt/sesam/bin/gui:/opt/sesam/bin/db:$OA_ROOT/schema/sesam/sql
export sesam2000 sesam_db OA_ROOT OPENRDA_INI SESAM_ROOT LANG PATH
echo sesam2000 directory = $sesam2000
#
# environment for sesam database
# ./opt/sesam/bin/db/setenv2.sh
#
# sesam2000 COMPUTERTNAME (necessary for local client!)
COMPUTERTNAME='uname -n | cut -f1 -d\.'
export COMPUTERTNAME
echo COMPUTERTNAME = $COMPUTERTNAME
#
# acroread in netscape
#pconfig="'alphaosf'"
#adir=/usr/local/Acrobat3
#NPX_PLUGIN_PATH="'$adir'"/Browsers/$pconfig
#export NPX_PLUGIN_PATH
#PATH=$PATH:"'$adir'"/bin
#export PATH
#
#DELIMITER FOR damisql
SEP='/'
export SEP
```

```
#
# some alias
alias work="cd $sesam2000"
work_dir='dirname $sesam2000"/work'
alias cat_info='cat /opt/sesam/var/work/info/info.dat'
alias cat_status="ls -t /opt/sesam/var/prot/*.status | head -1 | xargs cat"
alias cat_prot="ls -t /opt/sesam/var/prot/*.prt | head -1 | xargs cat"
#
# EXTENSION PSQL
if type psql } /dev/null 2;&1
then
alias sql="psql -d sesam_db -p 11201 -c"
else
alias sql="damisql -d sesam_db -q"
fi
#
# EXTENSION SET CDPATH
CDPATH=$CDPATH:/opt/sesam:/opt/sesam/var:/opt/sesam/var/log:/opt/sesam/var/work:
/opt/sesam/bin
#
# EXTENSION SET LD_LIBRARY_PATH
LD_LIBRARY_PATH=/opt/sesam/bin/sesam
export LD_LIBRARY_PATH
#
For the execution of Sesam Kern modules on UNIX the environment variable LD_LIBRARY_PATH
must be set to [ID SEPs sesam]/sesam/bin directory ( See Example!).
# EXTENSION SET ODBCINI
ODBCINI=/opt/sesam/bin/sesam
export ODBCINI
#
```

If the Profile was not applied, when a SEPs sesam Program is called, sometimes appears the following error message:

```
UNIX TRU64: /sbin/loader: Fatal Error: cannot map libsm.so
Linux: error while loading shared libraries; libsm.so: cannot load shared object file: No such file or
directory
```

or some similar message.

## 2.4 Installation on Windows

### Operating system:

- Windows NT 4.0 (from ServicePack 4/6)

## 2.4. INSTALLATION ON WINDOWS

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- Windows 2000
- Windows 98 ( GUI and Klient only)
- Windows XP

### Hardware Requirements:

- Processor: Intel/AMD
- Frequence: from 100 MHz
- Main memory: from 64 MB (A bigger memory is an advantage for the speed)

### Software-Requirements:

- WinZip or under utils delivered unzip
- Working name resolution (correct DNS)

### Hint

If you want an installation over command call without interaction, then an installation-CD can be ordered at SEP AG, where the installation files are stored as \*.zip files. With the command call `sm_setup` in the directory of the \*.zip files (see 2.2) and with access to an appropriate unzip tool ( On the CD there is `unzip.exe` under `utils` ) it is possible to make the installation with a command call without further input.

This installation method is unusual under Windows, so on the installation CD are stored 3 self-extracting archives. They contain an Installshield, which offers for installation the SEPsesam programs contained in the archive.

- `nt_cli{VersionNr}-{Languagedesignator}.exe` = Installation of a Windows - client
- `nt_gui{VersionNr}-{Languagedesignator}.exe` = Installation of a Grafical User Interface (GUI) on a Windows - PC for a **SEPsesam**-Server on the network
- `nt_srv{VersionNr}-{Languagedesignator}.exe` = Installation of a **SEPsesam**-Server on a Windows-PC (This archive contains also the software for GUI, Client and Tapeserver, so their installation is also possible)

Please follow the instructions of the installation client! The installation client leads the user through the respectively necessary steps.

### 2.4.1 Basic procedures

The following steps are necessary to install the **SEPs** programs on Windows:

- Insert the CD-ROM in the CD-Drive of the computer. With the help of Windows Explorer or some similar program search the CD-ROM for a directory win32 and open this directory. Here you will find the self-extracting archives \*.exe and the readme\*.txt files.

**The readme files must be read before the installation.**

The corresponding exe file is called and so the archive is unpacked in a temporary one and the user chooses the respective program and the **{IV}**. All specifications are done in a dialog.

### 2.4.2 Windows Backup Server

Please start nt\_srv{VersionNr}-{Languagedesignator}.exe from the CD. (see 2.4)

### 2.4.3 Windows Client

Please start nt\_cli{VersionNr}-{Languagedesignator}.exe from the CD. (see 2.4)

### 2.4.4 Windows Tape Server

A Tape Server is a Client with extensions for the connection of RemoteDrive resp. RemoteLoader.

Please start nt\_srv{VersionNr}-{Languagedesignator}.exe from the CD. (see 2.4)

### 2.4.5 Windows Interface (GUI)

Please start nt\_gui{VersionNr}-{Languagedesignator}.exe from the CD. (see 2.4)

#### Hardware Requirements for the GUI:

Main memory: min. 64 MB/recommended 128 MB

#### Software-Requirements:

- Java Runtime Environment (JRE) or Java Development Kit (JDK) from 1.3
- Internet Explorer from 5 or Netscape Communicator from 4.6 for Online-Help
- Acrobat Reader from 4.0 for Online-Guide

The access rights of the GUI-computer to the **SEPs** Server are defined on the server side in the file **{IV}**\var\ini\sm.java.po li cy.

A corresponding entry can be created **on the server side** with the following call:

## 2.4. INSTALLATION ON WINDOWS

---

*sm\_setup allow\_gui {gui} {user}*

Example sm\_java.policy - NT-Version

```
// GENERATED sm_java.policy BY sm_setup $Id: setup.c,v 1.106 2002/11/06
11:11:55 sesam Exp $ FOR VERSION 2.0.1.13

// DO NOT CHANGE FORMAT DURING EDITING LINES

grant
{
    // ACCESS
    //permission java.security.AllPermission;

    // NET
    permission java.net.SocketPermission "*:11401", "connect,accept,resolve";
    permission java.net.SocketPermission "*:11301", "connect,accept,resolve";
    permission java.net.SocketPermission "*:21", "connect,accept,resolve";
    permission java.net.SocketPermission "*:25", "connect,accept,resolve";
    permission java.net.SocketPermission "127.0.0.1:*",
"connect,accept,resolve";
    permission java.net.SocketPermission "softnt6:*",
"connect,accept,resolve";

    // ETC
    permission java.util.PropertyPermission "user.dir", "read";
    permission java.util.PropertyPermission "user.name", "read";
    permission java.util.PropertyPermission "file.encoding", "read";
    permission java.util.PropertyPermission "java.rmi.server.hostname",
"read";
    permission java.util.PropertyPermission "*", "read,write";
    permission java.lang.RuntimePermission
"accessClassInPackage.sun.jdbc.odbc";
    permission java.lang.RuntimePermission "loadLibrary.JdbcOdbc";
    permission de.sep.sesam.gui.server.RestorePermission "*@*";
    permission de.sep.sesam.gui.server.OperatorPermission "*";
    permission java.lang.RuntimePermission "loadLibrary.ICE_JNIRegistry";
    permission java.sql.SQLPermission "setLog";

    // FILE
    permission java.io.FilePermission "D:\\sesam\\var\\-", "read,write";
    permission java.io.FilePermission "JdbcOdbcSecurityCheck", "write";
    permission java.io.FilePermission "<<ALL FILES>>", "execute";
};
```

**Hint**

In {ID}\bin\gui you will find the link `sesam_gui`. This link can be dragged with the mouse to the Windows Desktop or/and to the Taskbar or/and to the Startbutton.

With a double-click on this link starts the GUI of **SEPs**sesam( if the Kernel processes run (see 3.5)).

Deinstallation:

1. Start-Programs-SEP Aktiengesellschaft-Uninstall  
or
2. Start-Settings-Control Panel, then choose the folder "Software" and start the SEPs sesam-Uninstall-Routine.  
or
3. With the call  
*sm\_setup delete*

## 2.5 Installation on OS/2

On OS/2 only Client can be installed.

- cd Installation directory
- `sm_setup make_client {server}` (see 2.2)

With {server} the name of the **SEPs**sesam Server is given

**Deinstallation of the Client**

*sm\_setup delete*

## 2.6 SEPs sesam Client: Supported operating systems

SEPs sesam Clients are available for the following operating systems. For UNIX operating systems can be said, that generally all UNIX systems are supported. Further Clients upon request.

- OS/2
- PowerMAC\_OS
- UNIX

## 2.7. SEPSSESAM CLIENT: SUPPORTED ONLINE MODULES

---

- AIX from 4.1
  - BSD
  - Digital UNIX, Tru64 from 4.0x
  - HP UX Vers. 9,10 and 11
  - IRIX
  - LINUX Kernel 2.2.x I386 and IA64
  - OSF1UX
  - SCO-UNIX
  - SINIX
  - Solaris on Sparc 2.4
  - Solaris on I386 2.4
  - ULTRIX
- 
- VMS from 7.0
- 
- Windows Systems (98, NT, 2000, XP)

## 2.7 SEPsesam Client: Supported Online Modules

For the Backup of following databases resp. applications special Backup clients are available.

Database resp. application	on operating system
Informix 7.xx, 9,2000	LINUX (SuSE, Red Hat, Debian, further upon request) UNIX (SUN, HPUX, TRU64, AIX, Reliant UNIX, further upon request) Windows NT/2000/XP
Lotus Notes	LINUX (SuSE, Red Hat, Debian, further upon request) Windows NT/2000/XP
MS-Exchange 2000 or 5.5	Windows NT/2000/XP
MS-SQL Server	Windows NT/2000/XP
Oracle 7, 8.xx and 9i	LINUX (SuSE, Red Hat, Debian, further upon request) UNIX (SUN, HPUX, TRU64, AIX, Reliant UNIX, further upon request) Windows NT/2000/XP
SAP R/3 (with Oracle Datenbank)	LINUX (SuSE, Red Hat, Debian, further upon request) UNIX (SUN, HPUX, TRU64, AIX, Reliant UNIX, further upon request) Windows NT/2000/XP
SAP R/3 (with SAP DB Datenbank)	LINUX (SuSE, Red Hat, Debian, further upon request) UNIX (SUN, HPUX, TRU64, AIX, Reliant UNIX, further upon request) Windows NT/2000/XP

## Chapter 3

# The programs of SEPsesam

**SEPsesam** consists of a number of C- and Java programs, which carry out an unobstructed application flow through their cooperation on the server as well as on the client.

These programs can be found under `{ID}/bin` and the subdirectories `sesam`, `sms`, `db` and `gui`.

### 3.1 User Interface GUI (Graphical User Interface)

The User Interface of **SEPsesam** is programmed in Java and can be installed on any computer with Java Runtime Environment (JRE) from 1.3.

It communicates with the **SEPsesam**-Kernel over the JAVA-components RMI (RemoteMethodInvocation) and JDBC (JavaDatabaseConnectivity).

The JRE (JavaRuntimeEnvironment) contains the Java Virtual Machine (JVM) and is used for the execution of commands, entered through the user interface.

The RMI Server, implemented in Java, processes the calls at the SEPsesam Server. It uses a JDBC-ODBC Bridge for the access to the SEPsesam database and a CTRLD Socket connection for the direct call of SEPsesam programs.

### 3.2 SesamBackupClient - SBC

The SBC is the essential Kernel module for the data Backup resp. -Restore.

The corresponding program `sbc{.exe}` resides on the **SEPsesam**-Server as well as on the Backup client.

The SBC collects the data at the Client during Backup, packs it in a channel and sends it according to the XBSA Standard (X/Open Backup Service API) to the **SEPsesam**-Transfer-Protocol-Daemon ( **STPD**), which writes the data onto the target storage media.

During a Restore the data is read from the media, sent to the Client over the channel, received there by the SBC and distributed in the target files.

The data is transferred with an own ftp-library to resp. from the corresponding STPD-Server. SBC uses on UNIX-Systems the Backup command `cpio` with "Large File" support, while on NT-Systems the NT-specific MTF-Format is used and the Backup resp. Restore is performed in own modules.

Command **sbc**

```

sbc -{brgpkh} [-C <control_host>] [-d <device>] [-f <list_source>]
               [-F <data_format>] [-i <saveset_info>] [-j <job_name>]
               [-l <level>] [-L <control_target>] [-n <segment_number>]
               [-o <restore_type>] [-O <STOR/RETR_direct>]
               [-R <restore_target>] [-s <saveset_spec>] [-S <storage_node>]
               [-t <tape_spec>] [-T <since_time>] [-x <exclude_patterns>]
               [-X <exclude list>] [-v <level>]
               [<szBackupSource 1> [<szBackupSource 2> | <szBackupSource n>]] |
               [<szRestoreSpec 1> [<szRestoreSpec 2> | <szRestoreSpec n>]]

```

-b	Backups the data of a Client on the drive of another computer
-r	Restores the files at the Client
-p	Copies a file in ASCII-Mode from the own computer to an FTP-Server
-g	Copies a file in ASCII-Mode from an FTP-Server to the own computer
-h	Help printout on the Standard Output and Program-Break
-d {device}	Source or target on a computer for a Backup or Restore
-o {restore_type}	Describes different Restore-possibilities (r[ename], p[lain], over[write], n[ext])
-R {restore_target}	Relocation of the Restore directory structure
-s {savesetname}	Name of the Saveset
-S {storage_node}	Server or Storage Node
-v {level}	Sets the Verbose Level

### Example Backup

The files are backed up from a WindowsNT computer to a UNIX-computer. The files from directory c:\winnt are copied with increased Verboselevel 3 in the directory work to the Saveset my\_file\_safesetname.1.

“-d .” is interpreted at SEPsesam as directory {ID}/var/work.

```
sbc -b -S decunix -s my_file_safesetname.1 -d . -v 3 c:\winnt
```

### Example Restore:

The previously backed up files are copied back to the directory c:\temp\restore.

```
sbc -r -S decunix -s my_file_safesetname.1 -d /var/work -o over -R c:\temp\restore
```

Example put/get:

With put or get it is possible to copy files in ASCII-Mode from the own computer to another computer or vice-versa:

```

sbc -p -S decunix /tmp/test.dat C:\test.dat
sbc -g -S decunix C:\test.dat /tmp/test.dat

```

### 3.2.1 SBC Error codes

The following list contains all possible SBC Error messages.

```

/*CLI*/      {1001, E_ERROR, "Option -%c requires an argument."},
/*CLI*/      {1002, E_ERROR, "Unrecognized option: -%c."},
/*CLI*/      {1003, E_ERROR, "Double specified argument: -%c."},
/**/        {1004, E_ERROR, "Invalid function."},
/*CLI*/      {1005, E_ERROR, "Option -%c not available in this mode."},
/*CLI*/      {1006, E_ERROR, "Maximum number of backup files in command line
exceeded."},
/*XBSA*/     {1007, E_ERROR, "XBSA Call failed with message: %s"},
/**/        {1008, E_ERROR, "System call failed: %s"},
/*XBSA*/     {1009, E_ERROR, "XBSA Call BSACreateObject failed with message:
%s"},
/*XBSA*/     {1010, E_ERROR, "XBSA Call BSAEndData (closing saveset) failed:
%s"},
/*FILE*/     {1011, E_ERROR, "Unable to open file [%s] [%s]."},
/**/        {1012, E_ERROR, "Undefined \"HOME\" environment variable."},
/**/        {1013, E_ERROR, "Invalid function."},
/**/        {1014, E_ERROR, "Invalid number of colon separated fields within
savesetsource|savesettarget argument."},
/**/        {1015, E_ERROR, "Cannot get HOME directory."},
/**/        {1016, E_ERROR, "Cannot change directory to %s: %s."},
/*EXIT*/     {1017, E_ERROR, "Backup command call failed with exit value:
%i."},
/**/        {1018, E_ERROR, "DATA interface start failed: %s"},
/**/        {1019, E_ERROR, "System call [%s] timed out after [%i] seconds"},
/*EXIT*/     {1020, E_ERROR, "Backup source not specified. Exiting."},
/**/        {1021, E_ERROR, "Cannot read item header from archive: [%s].
Exiting."},
/**/        {1022, E_ERROR, "Unknown item header magic number [%s].
Exiting."},
/**/        {1023, E_ERROR, "Cannot read item header from archive:
[%s] [%d] [%d]. Exiting."},
/**/        {1024, E_ERROR, "Cannot parse item header: [%s]. Exiting."},
/**/        {1025, E_ERROR, "Cannot read item name from archive:
[%s] [%d] [%d].
Exiting."},
/*DIR*/      {1026, E_ERROR, "Cannot create temporary directory [%s]."},
/**/        {1027, E_ERROR, "Cannot read from remote archive: [%s]."},
/**/        {1028, E_ERROR, "Termination signal received!"},
/**/        {1029, E_ERROR, "Failed to kill DATA process [%d]:[%s]."},
/**/        {1030, E_ERROR, "Archive padding failed: [%s]."},
/**/        {1031, E_ERROR, "Cannot write to remote archive: [%s]"},
/**/        {1032, E_ERROR, "Cannot read item [%s]:[%s]. Padding remaining
[%u]
bytes..."},

```

```

/**/          {1033, E_ERROR, "Cannot write to remote archive. Exiting."},
/**/          {1034, E_ERROR, "Unable to open GEN interface: [%s]"},
/**/          {1035, E_ERROR, "Unknown item type: [%d]. Skipping remaining
bytes [%d]"},
/**/          {1036, E_ERROR, "Unknown item type: [%d]."},
/**/          {1037, E_ERROR, "Internal error. eHdrFmt unknown"},
/*CLI*/       {1038, E_ERROR, "Invalid argument [%s] for switch -%c."},
/*XBSA*/      {1039, E_ERROR, "Failed STP call [%s] [%s]."},
/*CLI*/       {1040, E_ERROR, "Invalid host specification for option -%c."},
/*CLI*/       {1041, E_ERROR, "Invalid argument for -%c. Encryption password
too long."},
/*CLI*/       {1042, E_ERROR, "Invalid usage. Try \"sbc -h\" for help
screen."},
/*CLI*/       {1043, E_ERROR, "Option -%c is required for this operation."},
/*CLI*/       {1044, E_ERROR, "Invalid time specification for since backup."},
/*REGISTRY*/  {1045, E_ERROR, "Error while retrieving user profile images."},
/*REGISTRY*/  {1046, E_ERROR, "Cannot enable backup/restore privileges."},
/*REGISTRY*/  {1047, E_ERROR, "Cannot disable backup/restore privileges."},
/*REGISTRY*/  {1048, E_ERROR, "Cannot find registry data."},
/*REGISTRY*/  {1049, E_ERROR, "Cannot enable registry privileges to retrieve
user
        profile images."},
/*REGISTRY*/  {1050, E_ERROR, "Error while unloading user profile images."},
/*REGISTRY*/  {1051, E_ERROR, "Cannot retrieve user profiles."},
/*REGISTRY*/  {1052, E_ERROR, "Cannot retrieve value for
[%s]\\ProfileImagePath"},
/*REGISTRY*/  {1053, E_ERROR, "Unable to open registry key: [%s]"},
/*INI*/       {1054, E_ERROR, "Invalid PHYSICAL_BLK_SIZE or
FORMAT_LOGICAL_BLK_SIZE
        in [%s]."},
/*ARCHIVE*/   {1055, E_ERROR, "Initialization of archive failed: [%s]"},
/**/          {1056, E_ERROR, "Error while retrieving items."},
/*ARCHIVE*/   {1057, E_ERROR, "Cannot create local archive [%s]. Error: %s"},
/**/          {1058, E_ERROR, "Error while writing data. Error: %s"},
/*ARCHIVE*/   {1059, E_ERROR, "Unable to open local archive [%s]. Error: %s"},
/**/          {1060, E_ERROR, "Error while reading data. Error: %s"},
/*ARCHIVE*/   {1061, E_ERROR, "Error while unpacking data. %s"},
/**/          {1062, E_ERROR, "Local file [%s] does not exist."},
/**/          {1063, E_ERROR, "Unable to open local file [%s]."},
/**/          {1064, E_ERROR, "Error while processing local file [%s]."},
/*FILE IO*/   {1065, E_ERROR, "Cannot create local file [%s]."},
/*FILE EXCL*/ {1066, E_ERROR, "Error while reading exclude pattern file
[%s]: [%s]."},
/*XBSA*/      {1067, E_ERROR, "XBSA Call BSAGetObject failed with message:
%s"},
/*CLI*/       {1068, E_ERROR, "-%c: Specified argument too long."},
/*CLI*/       {1069, E_ERROR, "-%c: Invalid argument - must be numeric."},
/*CLI*/       {1070, E_ERROR, "Mandatory argument not specified."},

```

```

/*CLI*/      {1071, E_ERROR, "-%c: Invalid time specified [use: hhmm]."},
/*CLI*/      {1072, E_ERROR, "Unable to open include list file. Argument:
-%c"},
/*CLI*/      {1073, E_ERROR, "-%c: Invalid verbose level specified [max. 3
allowed]."},
/*COM*/      {1074, E_ERROR, "SBC_COM_INTERFACE call failed: %s"},
/*COM*/      {1075, E_ERROR, "Error checking the include list specs: %s"},
/*COM*/      {1076, E_ERROR, "Error allocating include list specs. buffer:
%s"},
/*COM*/      {1077, E_ERROR, "Answer buffer empty."},
/*COM*/      {1078, E_ERROR, "SESAM server answer proccessing failed ! %s"},
/*ITEM*/     {1079, E_ERROR, "Archive could not be resynchronized. Exiting."},
/*COM*/      {1080, E_ERROR, "-%c: Invalid operation initiator specified !"},
/*CLI*/      {1081, E_ERROR, "-%c: Invalid argument - max. value exceeded!"},
/*CLI*/      {1082, E_ERROR, "-%c: Operation unspecified
[open|openjob|closejob|close]!"},
/*CLI*/      {1083, E_ERROR, "-%c: Operation [openjob|closejob|close] requires
the
        session ID argument!"},
/*CLI*/      {1084, E_ERROR, "-%c: Operation [open] doesn't need the session
ID
        argument!"},
/*COM*/      {1085, E_ERROR, "CWD command assembling failed!"},
/*COM*/      {1086, E_ERROR, "RETR command assembling failed!"},
/*MSEX*/     {1087, E_ERROR, "Invalid backup source [%s]."},
/*MSEX*/     {1088, E_ERROR, "MS Exchange server not specified."},
/*MSEX*/     {1089, E_ERROR, "MS Exchange server path not available. [%s]."},
/*MSEX*/     {1090, E_ERROR, "Cannot establish connection to remote Sesam
server."},
/*MSEX*/     {1091, E_ERROR, "Unable to open file [%s] : [%d]"},
/*MSEX*/     {1092, E_ERROR, "Backup operation failed."},
/*MSEX*/     {1093, E_ERROR, "Cannot end MS Exchange backup:[%s]"},
/*MEM*/      {1094, E_ERROR, "Unable to allocate memory."},
/*MSEX*/     {1095, E_ERROR, "Failed to read MS Exchange database file.
[%s]."},
/*MSEX*/     {1096, E_ERROR, "Failed to purge MS Exchange database log files
[%s]."},
/*MSEX*/     {1097, E_ERROR, "Cannot retrieve a file list from MS Exchange
server.
        [%s]."},
/*MSEX*/     {1098, E_ERROR, "Cannot save file [%s]."},
/*MSEX*/     {1100, E_ERROR, "Unable to open file [%s]: [%s]."},
/*MSEX*/     {1101, E_ERROR, "Restore operation failed."},
/*MSEX*/     {1102, E_ERROR, "Cannot end MS Exchange restore:[%s]."},
/*MSEX*/     {1103, E_ERROR, "Cannot get local database files paths. [%s]."},
/*MSEX*/     {1104, E_ERROR, "Error reading file header from archive."},
/*MSEX*/     {1105, E_ERROR, "Cannot register MS Exchange restore: [%s]"},
/*MSEX*/     {1106, E_ERROR, "Cannot find MS Exchange target for file [%s]."},

```

```

/*MSEX*/      {1107, E_ERROR, "Cannot read file header from remote saveset."},
/*MSEX*/      {1108, E_ERROR, "Invalid file header magic number. [%s]"},
/*MSEX*/      {1109, E_ERROR, "Invalid file size in header."},
/*MSEX*/      {1110, E_ERROR, "Invalid file name size in header"},
/*MSEX*/      {1111, E_ERROR, "Cannot read file name from remote saveset."},
/*MSEX*/      {1112, E_ERROR, "Unable to open file [%s]. Make sure the store
service
                has been stopped before restoring"},
/*MSEX*/      {1113, E_ERROR, "Unable to open file [%s] for restore: [%d]"},
/*MSEX*/      {1114, E_ERROR, "Failed to read [%d] bytes from remote
archive."},
/*MSEX*/      {1115, E_ERROR, "Failed to write to remote archive [%s]: [%s]"},
/*MSEX*/      {1116, E_ERROR, "Failed to read from remote archive [%s]."},
/*MSEX*/      {1117, E_ERROR, "Cannot close saveset."},
/*sbc_gen.sh*/{1118, E_ERROR, "[%s] not existent"},
/*CLI*/      {1119, E_ERROR, "SESAM server not specified."},
/*sbc_gen.sh*/{1120, E_ERROR, "Backup source could not be found. Exiting."},
/**/        {1121, E_ERROR, "For this operation option [-f @] require [-F
pipe].
                Exiting."},
/*KILL*/      {1122, E_ERROR, "Can not kill process group [%d], [%s].
Exiting."},
/*sbc_gen.sh*/{1123, E_ERROR, "sbc_gen.sh exit with error."},
/*FP*/        {1124, E_ERROR, "Error while browsing through process list:
[%s]"},
/*KILL*/      {1125, E_ERROR, "Cannot find matching process."},
/*KILL*/      {1126, E_ERROR, "Cannot perform core termination."},
/*CTRLC*/     {1127, E_ERROR, "Cannot detect currently logged user: [%s]"},
/*NETWORK*/   {1128, E_ERROR, "Network communication problem: %s"},
/*NETWORK*/   {1129, E_ERROR, "Not connected."},
/*CTRLC*/     {1130, E_ERROR, "STDIN channel not established: [%s]"},
/*INI*/       {1131, E_ERROR, "Unable to open initialization file: [%s]"},
/*CTRLC*/     {1132, E_ERROR, "STDIN channel broken: [%s]"},
/*CTRLD*/     {1133, E_ERROR, "Denying service. Maximum active connection
reached."},
/*CTRLD*/     {1134, E_ERROR, "Cannot start child process: %s"},
/*NETWORK*/   {1135, E_ERROR, "Remote IP address could not be resolved: [%s]"},
/*CTRLD*/     {1136, E_ERROR, "Host [%s] is not allowed to connect or security
problem for user: [%s]."},
/*INTF*/      {1137, E_ERROR, "Parameter too long."},
/*STREAM*/    {1138, E_ERROR, "Pipe creation problem: [%s]."},
/*CTRLD*/     {1139, E_ERROR, "CTRLD reply: %s"},
/*PROCESS*/   {1140, E_ERROR, "Unable to start process: [%s]"},
/*PROCESS*/   {1141, E_ERROR, "Unable to start thread: [%s]"},
/*CLI*/       {1142, E_ERROR, "-%c: Mandatory argument not specified."},
/*DLL*/       {1143, E_ERROR, "Problem while loading dynamic link library:
[%s]."},
/*DLL*/       {1144, E_ERROR, "Problem while unloading dynamic link library:

```

```
[%s]."},
/*STPD*/      {1145, E_ERROR, "SESAM server signal received: [%s]"},
/*DB*/        {1146, E_ERROR, "DATABASE client error: [%s]"},
/*Item*/      {1147, E_ERROR, "Unable to access item [%s]: [%s]."},
/*W2KSS*/     {1148, E_ERROR, "W2KSS Error: [%s]."},
/*Encryption*/{1149, E_ERROR, "Encryption password validation failed."},
/*Ex2K*/      {1150, E_ERROR, "Ex2K Error: [%s]."},
/*Encryption*/{1151, E_ERROR, "Encryption/Decryption operation failed."},
/*Encryption*/{1152, E_ERROR, "Writing SSET file failed."},
/*Encryption*/{1153, E_ERROR, "Reading SSET file failed."},
/*CLI*/       {1154, E_ERROR, "Invalid argument for switch -%c."},
/*LAST*/      {9999, E_ERROR, "Unknown message code: [%d]."}

```

### 3.2.2 Optional Extensions of SBC

The Standard is **Backup Type Path**, whose source is a full path specification at the Client.

Examples:

For WNT : D:\Program Files

For UNIXe: /usr/users

In case that several Backup sources are saved from the Client in a single task, they should be specified delimited with commas.

Examples:

For WNT : D:\Program Files, D:\MSOffice

For UNIXes: /usr/users, /usr/homes, /opt/sesam

For better readability spaces after the comma are allowed. Further they are ignored.

License-needing extensions are:

- **Backup type Exchange Server**

As source of an Exchange Server Backup should be specified the identification of the Exchange database (often identical with the WNT Server name).

- **Backup type INFORMIX**

As source of an INFORMIX Backup should be specified the identification of the INFORMIX database. An INFORMIX task is started externally from the INFORMIX System with ON-BAR.

- **Backup type Lotus Notes**

As source of a Lotus Notes Backup should be specified the identification of the Lotus Notes database.

- **Backup type MS SQL Server**

As source of a MS SQL Server Backup should be specified the identification of the SQL Server database.

- **Backup type ORACLE**

As source of an ORACLE Backup should be specified the ORACLE SID of the ORACLE database. An ORACLE task is started externally from the ORACLE System with RMAN.

- **Backup type ORACLE7**

As source of an ORACLE7 Backup should be specified the ORACLE SID of the ORACLE database. The Start of an ORACLE7 Backup requires the sesam client Software sbc\_ora7. ORACLE7 tasks can be started directly from the SEPsam System.

- **Backup type SAP/R3**

As source of a SAP/R3 Backup should be specified the SAP/R3 ID of the SAP/R3 database. A SAP/R3 task is started externally from the SAP/R3 System with BRBACKINT (br-backup/brarchive/brrestore).

**SEPsam** makes possible the execution of an external Backup Utility (INFORMIX: ONBAR, ORACLE: RMAN, SAP/R3: BRBACKINT) with the help of a command event.

## 3.3 The Programs of the Server

### 3.3.1 The Kernel programs

Under {ID}/bin/sesam reside the Kernel programs sm\_\*.exe of the **SEPsam**-Software. The programs, presented below, can be called directly from the command line. The programs, which are not presented, are contacted internally by those described here as subprogram calls. A direct call is therefore not necessary.

The command syntax generally corresponds to the getopt-Standard, i.e. sm\_\* -{Switch} {Value} ...

#### Hint

**Improper usage of these commands can lead to severe functionality problems.**

#### 3.3.1.1 sm\_backup

##### Description

sm\_backup controls the execution of a Backup task.

List of the sub-functions:

```
GET_BACKUP_TYP
GET_NODE_PARAMS
GET_TASK_PARAMS
CHECK_LICENSE
CHECK_SEMAPHORES
CHECK_MEDIUM      -> sm_init in case no media available
CHECK_PERMIT      -> Alive test at the Client
PRE               -> PRE-Interface
```

### 3.3. THE PROGRAMS OF THE SERVER

CHECK\_SMS\_WATCH -> Performance- and EOM-Surveillance  
EXECUTE\_BACKUP -> CTRLC -> SBC -> STPC -> STPD -> SMS  
POST -> POST-Interface  
RESULT\_ANALYSE

Switch	Description	Default
-j task	Task name	TEST_BACKUP
-l char	Backup type (C F D I) (Copy Full Diff Incr)	C
-m pool	Media pool in which should be backed up	Pre-setting
-d drive	sesam-internal drive number	1.drive of the media pool
-T time	Start time "'hh:mm dd-mm-yyyy'"	
-W time	End time "'hh:mm dd-mm-yyyy'"	
-S tapeserver	computer to whose drive should go the data	SEPsesam-Server
-p num	Priority	1
-s saveset	Name of the saveset	time stamp
-v num	0 1 2 3 = verbose level	1

#### 3.3.1.2 sm\_drive

Kernel program for the so called Drive handler in **GUI:Components-Drives-Drive action**.

#### Description

Module for execution of all drive specific requests (local and remote).

**Syntax:** sm\_drive {Function} {Drivnumber} [Label]

Function	Description
init	initializes the media in the drive with Label
info	output Label and MOUNT-State of the media
mount	sets the media in MOUNT-State
dismount	clears the MOUNT-State

In MOUNT-State at an info request the label is not read from the media, which would require a rewind to the beginning of media, but from the database. MOUNT is therefore a pure software-technical state, which avoids time-consuming rewinds.

So it is absolutely necessary to control the drives of **SEPsesam** with this drive handler only. In MOUNT it is generally possible to take a cassette out of a drive. Problem: **SEPsesam** works then possibly on the wrong media.

The drive information remains consistent only in case that before the unload of the cassette a Dismount was performed.

Return values on the STDOUT:

STATUS=SUCCESS|ERROR MSG={Desired output | Error message}

### 3.3.1.3 sm\_info

Front end Kernel program for the **GUI:Display of current messages???**.

#### Description

Writes and reads messages in resp. from the SEPsam Online Information area ("Display of current messages").

**Syntax:** sm\_info {P/S/M/C} [{Drive number}] [{Text}]

**Read from the information area** sm\_info P [{Drive number}]

**Write status message** sm\_info S {Drive number} {Text}

**Write message** sm\_info M {Drive number} {Text}

**Check and output the license** sm\_info C

### 3.3.1.4 sm\_init

Kernel program for the **GUI:Activities-Immediate start-Media event**, resp. planned media event.

#### Description

Initializes a media in a drive, so that it is then ready for Backups.

At this point either a fixed label or a media pool can be specified. If a pool is given, the label is selected after the **GET\_OLDEST**-Strategy.

number of retries still cannot be initialized (Loader problem, Bad media etc.), an attempt is made to take a new media from the SPARE-pool into the given one.

Switch	Description
-d drive number	sesam-internal number of the drive
-m media-pool	Name of the media pool ( not used, if -t is also specified)
-t label	Label with which the media should be initialized
-L type	optional login type; default: empty ; eom   backup from internal control
-i identifier	optional identification for this execution ; is set internally

Output:

exits with 0/1 = ok / error

writes GLBV gv\_init\_msg-'drive number' = really initialized media

### 3.3.1.5 sm\_loader

Kernel program for the so called Loader handler in **GUI:Components-Loader-Loader action**; Lays a layer over the Sesam Loader Utility SLU (comp. 3.7).

#### Description

### 3.3. THE PROGRAMS OF THE SERVER

Loader program for coordination of the loader functions. Performs reload sequences, keeps the database consistent, sets the Mount-State, writes protocol messages in the **SEPsesam** daily protocol.

`sm_loader import/export/load/unload/show + further switches`

Switch	Description
<code>import</code>	transfers a media from an IO-Port to a slot and transfers the slot information for the media label to the media archive, in case that the media label can be determined using a bar code and the media was already initialized.
<code>export</code>	transfers a media from a slot to an IO-Port and removes the corresponding slot information from the media archive
<code>load</code>	loads a media from a magazine slot into a drive
<code>unload</code>	unloads a media from a drive into a slot, if necessary the media is set offline first
<code>show</code>	shows the contents of the loader, using the barcode reader if available; Result in <code>{ID}/var/work/showlist_{ln}-{dn}.tmp</code>
<code>-l num</code>	sesam-internal number of the loader
<code>-d num</code>	sesam-internal number of the drive for load, unload, show
<code>-s num/label</code>	sesam-internal number of the IO-Port for export, import Slot number or media label (Slot is determined using the media archive) (mandatory for load, export and import; optional for unload and show)
<code>-o no_mount</code>	optional; do not set the loaded media to MOUNT-State
<code>-L logfile</code>	Redirection of the logging output to a special file
<code>-v num</code>	Verbose level 0, 1 or 2
<code>-h</code>	Help output of the call interface

#### Return value(s):

GLBV `gv_loader_sts_{ln}` Result status: +/- (o.k./failure)

GLBV `gv_loader_msg_{ln}` Value or message

#### Example

`sm_loader import -l 1 -d 0 -s 0 >>` Imports the media in Loader 1 from IO-Port 0 to Slot 0

`sm_loader unload -l 1 -d 2 s 5 >>` Unloads the media in Drive 2 of Loader 1 to Slot 5

#### 3.3.1.6 sm\_recover

##### Description

**SEPsesam** command-line interface to analyse a media and restore data or listing from its savesets.

Requires a media inserted into drive.

Missing information are entered in a dialog with user.

Tape changes for further tapes are requested automatically.

Switch	Description
-d drive_number	<b>SEPsam</b> drive number
[-j SEPsam task]	filters savesets of this task
[-o stop nostop  disk.info ]	SEPuler (default: nostop) LINUX disk info restore
[-f file]	containing <b>SEPsam</b> restore command ( from disaster-information for ex.) the data-restore is directly started without scanning the media
[-F file]	containing output of a media-scan
[-R target-path]	new target (no trailing slash) for -o disk.info default = /mnt/disk

### Return value(s):

- listing of savesets on tape or
- restores selected saveset from tape to target dir

### Example

sm\_recover

#### 3.3.1.7 sm\_restore

### Description

Main Restore program

- makes the necessary media available
- sorts the list of the selected files (selective Restore) according to the LIS-file
- controls the execution of the specific Restore programs
- controls the Generation Restore
- protocols the proceeding in (Database, Protocol files)

### 3.3. THE PROGRAMS OF THE SERVER

Parameter	Description
P1	Target computer/User/Execution counter of the Backup run or Restore task/Start time (Format Start time: YYYY-MM-TT hh:mm:ss) for restart of a Restore task (here no further parameters necessary)
P2	Drive number/Interface
P3	mode = (new   over   not   system   image) if there is a '&' inserted, then the directory structure is rebuilt, otherwise 'flat' Restore in the target directory is performed
P4	SEPsasam-Backup task
P5	Date of the Backup
P6	Media label
P7	Completeness-Flag = 'yes', Full-Restore should be performed or Time stamp, the file {ID}/var/sel/{Timestamp}.sel contains the list of selected files
P8	Target directory or '//ORIGINAL'

#### Syntax

```
sm_restore P1 P2 P3 P4 P5 P6 P7 P8 or
sm_restore P1
```

#### Hint

For selective Restores selection files are necessary. They are created during the selection in the Restore wizard (GUI), or can be created with an editor from the existing LIS-files.

#### Example

```
sm_restore sesamx/DK/8 1/LOCAL 'not&' sesam.etc 04.04.2000 S00012 yes '//ORIGINAL'
```

The contents of the Restore task will be restored to the original directory. Existing Original-files will not be overwritten and no file-tree structure will be built

```
sm_restore decuberlin/root/1 1 over decuberlin.te6 08.08.2001 DISK00003 yes '/usr/test7'
```

The contents of the Restore task will be restored to a new target directory. Existing Original-files will be overwritten.

```
sm_restore "'20010802_101680/2001-08-08 14:32:28'"
```

Restart of a Restore task 20010802\_101680, which has been previously created.

#### 3.3.1.8 sm\_robot

##### Kernel program for the GUI:Components-Loader-Content-Archive Adjustment

Checks all labels of media in the slots of the loader magazine. If the label already exists in the media archive, loader and slot are adjusted. If the label is not in the media archive, the media is introduced in the media archive with check of the label format (if -i (introduce) is specified).

The contents of database tables media and loader\_contents are updated and an entry in the daily protocol is created.

#### Input parameters:

Switch	Description
-l num	Loader-number
-d num	Drive-number
-i	Introduce-Flag (introduce), leads to introduction of new resp. unknown media in the archive
-t type	Media-Type (only when -i also specified)
-m pool	Media pool (only when -i also specified)
-s num	Slot-Count (Specified if not all slots are served) Syntax: xx-yy z.B. 0-9
-c	Flag, if the media label should be additionally checked independently from the recognized bar code
-v	Verbose-Flag (0/1/2)
-h	Help Output to the Standard Output and Program-break

**Example**

```
sm_robot -l 2 -d 1 -i -t THXKD -m E -s 2-7 -cv >> Introduction of all unknown media in Slot Area 2-7  
sm_robot -l 2 -d 1 >> Archive adjustment
```

**3.3.1.9 sm\_sms\_interface**

The access to SMS-Media (Tapes, Disks) is implemented in the **sm\_sms\_interface** program. The most important calls are the determination of label (Get Label) and the initialization of media with a new media label (Initialize). In case of a problem the tapes can be labeled again.

**Syntax:**

sm\_sms\_interface command options

**Initialization of a media**

```
sm_sms_interface init  
-d {Device}  
-B {Block-size} Default: 65536  
-t {Label}: {Tape-ID}  
-i {Tape Info}  
-r {Rewind Flag} Default: R  
-T {Timeout} Default: 120
```

**Example**

```
sm_sms_interface init -d Tape1 -t S00007:7 -i Info -r R -T 60
```

**Read the media label**

```
sm_sms_interface getlabel  
-d {Device}  
-r {Rewind Flag} Default: R  
-T {Timeout} Default: 120
```

### 3.3. THE PROGRAMS OF THE SERVER

---

#### **Example**

```
sm_sms_interface getlabel -d Tape1 -r R -T 60
```

#### **Read the tape contents**

```
sm_sms_interface dir -d {Device}
```

#### **Example**

```
sm_sms_interface dir -d Tape1
```

#### **Read the Tape Trailer (contains possibly following tape-label**

```
sm_sms_interface read_tape_trailer -d {Device}
```

#### **Example**

```
sm_sms_interface read_tape_trailer -d Tape1
```

#### **Write the Tape Trailer**

```
sm_sms_interface write_tape_trailer -d {Device}
```

```
-t {Label}:{Tape-ID}
```

```
-l {NextTapeLabel}
```

```
-i {TapeTrailerInfo}
```

```
-e {EOMFlag} Default: F = FALSE
```

```
-g {EMRGFlag} Default: F = FALSE
```

#### **Example**

```
sm_sms_interface write_tape_trailer -d Tape1 -t S00001:7 -l S00008 -i Info -e T -g T
```

#### **Unload the drive**

```
sm_sms_interface unload -d {Device}
```

#### **Example**

```
sm_sms_interface unload -d Tape1
```

#### **Write data on the media**

```
sm_sms_interface backup_file -d {Device}
```

```
-t {Label}:{Tape-ID}
```

```
-f {Source File Name}
```

```
-s {Saveset Name}
```

```
-i {Saveset Info}
```

```
-I {Interpreter} Default: none
```

#### **Example**

```
sm_sms_interface backup_file -d Tape1 -t S00007:7 -f x.dat -s x.sav -i Saveset-Info
```

#### **Read a saveset from the media**

```
sm_sms_interface restore_file -d {Device}
```

```
-t {Label}:{Tape-ID}
```

```
-f {Target File Name}
```

```
-s {Saveset Name}
```

```
-i {Saveset Info}
```

#### **Example**

```
sm_sms_interface restore_file -d Tape1 -t S00007:7 -f x.dat -s x.sav -i Saveset-Info
```

#### **Create the LIS- and SGM-Files from a Saveset on the media**

```
sm_sms.interface restore_listing -d {Device}  
-t {Label}:{Tape-ID}  
-n {Start Segment} Default: 0  
-b {Number of Blocks} Default: 0  
-s {Saveset Name}  
-i {Saveset Info}  
-I {Interpreter} Default: none
```

**Example**

```
sm_sms.interface restore_listing -d Tape1 -t S00007:7 -n 15 -b 150 -s x.sav -i Saveset-Info
```

**Restore of a Saveset directly from the media**

```
sm_sms.interface restore_emergency -d {Device}  
-t {Label}:{Tape-ID}  
-f {Target Pipe Name}  
-n {Start Segment} Default: 0  
-b {Number of Blocks} Default: 0
```

**Example**

```
sm_sms.interface restore_emergency -d Tape1 -t S00007:7 -f sesam -n 15 -b 150
```

**Restart SMS**

```
sm_sms.interface restart_sms -d {Device}
```

**Example**

```
sm_sms.interface restart_sms -d Tape1
```

**Read again the changed configuration for the running SMS**

```
sm_sms.interface reread_ini -d {Device}
```

**Example**

```
sm_sms.interface reread_ini -d Tape1
```

**Inquire SMS Device Status**

```
sm_sms.interface inquire_status -d {Device}
```

**Example**

```
sm_sms.interface inquire_status -d Tape1
```

For all functions from `sm_sms.interface`, presented here, there are also the parameters

- v {n} for tracing Default: 0 (no trace)
- L {LoginType} Default: SHARE. For inquiries use INQUIRE, for Restores is necessary EXCLUSIVE, in State CHANGING\_MEDIA is accepted EOM only and for Administrative purposes ADMIN is used.

### 3.3.1.10 sm\_sms\_watch

Kernel program for the control of media change and for the output of tape state in the GUI Info window "Display current messages" (see 3.3.1.3).

**Description**

Monitors the drive state and takes over the control at media change. Communicates in case of

### 3.3. THE PROGRAMS OF THE SERVER

---

”End Of Media” (EOM) with SMS for transfer of the new tape label and with sm\_loader for the change of the media.

#### Syntax:

sm\_sms\_watch {Drive number}

#### Hint

In case of a problem at tape change the corresponding sm\_sms\_watch Logging is helpful for the Problem analysis.

#### Hint

At the start of a Backup resp. Restore task a check is made if sm\_sms\_watch is running in the corresponding queue and it is started again, if necessary (see 3.3.3.3). If an sm\_sms\_watch process is already running, then the subsequently started process exits.

#### Hint

Without the sm\_sms\_watch process for the corresponding drive, the approaching tape end will not be recognized! The media change for the Backup resp. Restore will not be performed!

#### 3.3.1.11 sm\_startup

Starts the **SEPsesam** Software.

- starts the background processes (Services) (see 3.5)
- prepares the drives and loaders
- sets up the queues
- sets up the actual **SEPsesam**- Backup day

### 3.3.2 SEPuler (SEPsesam Scheduler)

The SEPuler consists of the programs `{ID}/bin/sesam/sm_sepuler{.exe}` and `./sm_sepuler_cal{.exe}`.

sm\_sepuler{.exe} is started as a background process (Service/Daemon) (see 3.5) and controls events in the database table *terms*.

When the start time of an event is reached, sm\_sepuler{.exe} calls the program `{ID}/bin/sesam/sm_sepul_event{.exe}` with the event parameters.

In `{ID}/var/ini/sm.ini` the following execution parameters for the SEPuler can be set:

```
...
[SM_SEPULER]           -> Section for the SEPuler
SLEEP=30                -> Working tact in seconds
EVENT=sm_sepul_event    -> Event-program
...
```

The program `{ID}/bin/sesam/sm_sepuler_cal{.exe}` serves for processing of the Calendar sheet, whose data is stored in the database table `cal_sheets`.

The logging of SEPuler-programs is set in `{ID}/var/ini/debug.ini` (see 4.6.1):

```
...  
SM_SEPULER=1  
SM_SEPULER_CAL=1  
SM_SEPUL_EVENT=1  
...
```

So appear

```
{ID}/var/log/lgc/sepuler.lgc  
{ID}/var/log/lgc/sepul_ev_{Schedule_name}_{Time_stamp}.lgc
```

### 3.3.3 Queue Manager

The Queue Manager is a software, which creates and controls the Queues.

In a Queue Jobs can be set for execution with a Start time (submit). The Queue Manager then takes care, that a Job is activated at its Start time (**executing**), whereby always only as many Jobs can be executing, as specified in the `joblimit` of the queue. Jobs, whose start time is still not reached, are **holding**, whose start time is reached, but still may not run because of the `joblimit` are **pending**.

In **SEPsam** the Queue manager is used for distribution of Backups, Restores, Initializations etc. upon the available drives. For each drive group a queue with the same name is created, which owns an executing queue for each drive.

This allows a specific access to the system resources according to the parallel processing level, assigned to each resource (`joblimit`). If a drive is configured for maximum 4 simultaneous Backups, the corresponding level of parallel processing is exactly forced through restriction of the assigned queue to maximum 4 tasks (`joblimit`).

The cooperation between SEPuler and Queue manager happens in a way, that the user specifies in the SEPuler events for Backups, Restores, Initializations etc. and these are transferred to the Queue Manager according to the resource used when the start time is reached. The Queue manager then determines, according to the load of the resource, when the action will be actually executed.

There can be scheduled e.g. in the event calendar 100 Backups on a specific drive at the same time. They are transferred to the Queue manager, t.m. set in the waiting queue of the drive. The drive can however have maximum 60 SMS-Channels (see 3.3.6), so the Queue manager activates immediately 60 Backups and the remaining are subsequently started, when a channel is released.

If the start time window of the Backup is narrowly defined, it can happen, that at the end some Backups cannot reach execution at all, which is signalled and protocolled by **SEPsam**.

### 3.3. THE PROGRAMS OF THE SERVER

The Queue Manager consists of the programs

`{ID}/bin/sesam/sm_qm_main{.exe}` and `./sm_qm{.exe}`.

`sm_qm_main{.exe}` is the Queue Manager-Server and is started as a background process (Service/Daemon) (see 3.5), which waits for requests from the Queue Manager-Client `sm_qm{.exe}` and controls the Queues.

#### Syntax `sm_qm`:

The call has the Form: `sm_qm {request} {further arguments}`

Request	Arguments	Description
block	QueueName[/Resource]	creates??? Queue, with Resource a specific Executing Queue is selected
delete	QueueName	removes the Queue
init	QueueName[/Resource[...]] Joblimit	creates Queue with Joblimit, with "Resources" several Executing Queues can be specified
sho	QueueName all	shows the Queue resp. all Queues and their contents and states
sho/name	QueueName all	shows the Queue resp. all Queues with job names
sho/full	QueueName all	shows the Queue resp. all Queues with execution parameters
start	QueueName[/Resource]	starts the Queue after stop or block
submit	QueueName,Program + Arguments	sets Program in the Queue under an entry number
job_sho	QueueName      Jobname [Count]	shows Entry number and Status for "count" Job-name
del_entry	Entrynumber	terminates the job (process) selected through its Entry number
shutdown		terminates the sm_qm_main process (delete Queues and Jobs)

#### Example

```
# sm_qm -h
$Id: admin_manual.tex,v 1.16 2004/03/11 11:48:15 sesam Exp $
-----
-
Usage: sm_qm {command} ...      {command} ... as shown below
block   {queue}[/resource]      blocks queue's holding and pending jobs
delete  {queue}                  deletes the queue
init     {queue}[/resource][...] {job_limit}    creates queue with job limit
every resource defines an executing queue
sho      {queue}|all             shows queue or all queues with file names
sho/name {queue}|all             shows queue or all queues with job names
sho/full {queue}|all             shows queue or all queues with parameters
start    {queue}[/resource]      restarts queue or resource
stop     {queue}[/resource]      stops queue or resource and kills running jobs
submit   {queue}[/allocate[/resource]|all]]
        {starting time}          format: hh:mm
```

<code>{starting date}</code>	<code>format: dd-mm-yyyy</code>
<code>{priority}</code>	<code>starting priority: integer</code>
<code>{job}</code>	<code>job name as you like</code>
<code>{file}</code>	<code>full qualified file name to execute</code>
<code>[{argument} [...]]</code>	<code>optional job arguments for execution</code>
	<code>creates a job with entry number in queue</code>
	<code>optional: allocate resource (default: unknown)</code>
	<code>preferred resource</code>
<code>job_sho {queue} {job} [{count}]</code>	<code>shows entry and status of [count] job</code>
<code>del_entry {entry_number}</code>	<code>deletes the given job</code>
<code>shutdown</code>	<code>shutdown of sm_qm_main; delete queues &amp; jobs</code>

### 3.3.3.1 Queue Manager Concept

In SEPsesam each Backup is assigned to a media pool. A media pool is always unambiguously assigned to a drive group. Normally several different media pools are assigned to the same drive group, e.g. a drive group for FULL/DIFF/INCR, Weekend/Working\_days or ORACLE/File\_system.

For the processing of a Backup task without drive specification a suitable drive from the drive group must be selected. If no drive contains media from the desired media pool, then a strategy for bringing a media must be processed.

According to the concept the media from a media pool can be dynamically (on demand) requested.

### 3.3.3.2 Queue per drive group

The Backup tasks are then positioned in drive group - Queues, according to the assignment media pool to drive group. The drive group-Queue has a holding resp. pending Queue and for each drive - an executing-Queue.

Each job and the executing-Queue have the attribute "allocate". With this attribute an allocation (generally a media pool) is assigned to a job. The attribute of the job is assigned to the executing queue, when a job is started in this queue.

A job can be started in an executing-Queue, only in case, that

- the executing-Queue is "deallocated", or
- the executing-Queue is already identically allocated (Attribute allocate is the same).

Additionally a pre-selection of the executing-Queue, t.m. a specific executing-Queue (drive) can be given for a job, (Attribute Preferred Resource).

### 3.3.3.3 Tape end check for each drive

The SEPsesam process `sm_sms_watch` is used to monitor the physical end of a media during a Backup or Restore. It checks the drive state and transfers the drive information (Throughput, Status, etc.) to the SEPsesam information system (see also 3.3.1.3).

This process runs in its own queue per drive, namely the queue "qu\_tape\_trans{Drive Number}". In this way, it is guaranteed, that this process monitors the drive independently of the state of the drive group.

#### 3.3.3.4 Processing of the Jobs

The processing of Backup tasks is done in the drive group-Queues. The Jobs are processed according to priority and FIFO (first-in-first-out).

The program looks for an available drive, t.m. the first drive, which is allocated for the desired media pool and still has place for the Backup task. If no such drive exists, then the first deallocated drive is used. If all drives are allocated, the program (according to FIFO) looks for the next job with the same priority but other media pool.

Backups with fixed drive assignment (selection) are started in the corresponding drive, as soon as it is suitable for them (not used resp. allocated for the desired media pool).

The processing is started, when

- a new job is brought in the drive group-queue (submit),
- a Job goes from the holding queue to the pending queue (Expiration of the holding time)
- a place in an executing queue is free, t.m. a job in a drive queue is finished.

The processing of the drive group stops, when

- all jobs with the actually highest priority are processed,
- there is no free place in the drive queues.

A deallocated drive is reserved through an allocation for the corresponding media pool.

The Backup task attempts to find and load an available media. A new media is requested if necessary.

#### 3.3.3.5 que\_init for drive groups

The call for the creation of a drive group-queue follows below:

```
sm_qm init <queue-name>[/<resource>][/...] <job_limit>
```

#### Example

```
sm_qm init loader1/1/2/3 5      ## Drive group:    loader1
                                ## Drive Numbers:      1, 2 and 3
                                ## Joblimit per Drive is 5
```

### 3.3.3.6 Specification of a media pool and optional drive number

When a job is submitted in the queue, the attribute allocate must contain the desired media pool. If additionally a drive number is specified, it must be transferred as well.

If allocate is not specified on the command line, the standard value 'unknown' is used.

So we have the following:

```
sm_qm submit <queue-name>[/<allocate>[/<resource>]]
                                creates a job with Entry Number in the
                                specified Queue
                                optional: allocate (Default: 'unknown')
                                preferred Resource

                                <starting time>          Format hh:mm
                                <starting date>          Format dd-mm-yyyy
                                <priority>               Integer
                                <job-name>               Identifier
                                <file>                  fully qualified program name
                                <par1>...<par8>          optional max. 8 parameters
```

Example 1: Job oracle\_P01 with media pool ORACLE on drive group loader1

```
sm_qm submit loader1/ORACLE 12:00 04-04-2001 3 oracle_P01
/opt/sesam/bin/sesam/sm_auto_backup -l F -T "12:00 04-04-2001"
-W "14:00 04-04-2001" -m ORACLE oracle_P01
```

Example 2: Job linux1\_full with media pool FULL on drive group loader1 with Drive\_num=1

```
sm_qm submit loader1/FULL/1 12:00 04-04-2001 3 oracle_P01
/opt/sesam/bin/sesam/sm_backup -l F -T "12:00 04-04-2001"
-W "14:00 04-04-2001" -m FULL linux1_full
```

### 3.3.3.7 Drive number specification to a starting program

When a job is started in the executing queue, it needs the drive number. This number is therefore specified as additional parameter at the start of the corresponding program (e.g. sm\_backup) on the command line (-d drive\_number).

Call over: sm\_qm submit ... (without "-d 2"):

```
sm_backup -j SESAM_BACKUP -m DISK ... -d 2
                                #^^^^ the resource is specified
                                #      by sm_qm_main
```

A called sm\_backup receives, as an argument, the drive on which it will actually start. While starting sm\_backup it enters immediately the drive number in the table results.

#### 3.3.3.8 Processing in case the desired drive is blocked

If a drive number was specified, it will be skipped, if the resource is blocked (e.g. the drive is defective).

The Queue Manager selects instead another drive with the desired allocation (Pool).

#### 3.3.3.9 Lock drives

If a drive is defective, it must be temporarily locked. The function block is used here.

```
sm_qm block <queue-name>[/<resource>]      # blocks holding and pending jobs
                                              # If resource is specified, the
                                              # corresponding executing Queue
                                              # is blocked as well
```

#### Example

```
sm_qm block loader1/3          ## blocks drive 3 in the drive group loader1
```

#### Hint

The queues for drive groups are initialized and started again at drive configuration. This happens upon configuration changes and at SEPs sesam Startup.

#### 3.3.3.10 Monitoring drive group queues

The function sho shows for a Multi-Queue the attribute allocate, resource and the state of all executing queues.

```
sm_qm sho[/full] [/name]      <queue-name>
```

#### Example

```
sm_qm sho/name loader1
```

```
que_name= loader1      job_limit= 5      status= running
Entry  Job_name        Time   Date              Priority  Allocate
Preferred-Resource

holding queue

pending queue
32      oracle_P01      12:30   3-4-2001          1         ORACLE      1
30      oracle_C01      12:30   3-4-2001          1         ORACLE

executing queue  Resource= 1              status= running      allocated= DIFF
2          bfasco_2bnd      10:24   3-4-2001          1         DIFF
```

```

31      bfasco_ex1      12:30      3-4-2001      1      DIFF

executing queue Resource= 2      status= running      allocated= FULL
4      bfasco_2      10:24      3-4-2001      1      FULL      2
17     bfaaix_2      12:30      3-4-2001      1      FULL      3

executing queue Resource= 3      status= blocked      allocated=

executing queue Resource= 4      status= running      allocated= INCR
29     bfasinix_2      10:24      3-4-2001      1      INCR      2

executing queue Resource= 5      status= running      allocated=
RESTORE (hard)
-----
  
```

### 3.3.3.11 Jobs without media pool assignment

A Backup task must always have a media pool assigned. Other jobs without media pool, which want to allocate exclusively a drive, generate an unambiguous value and allocate the drive with it. So is guaranteed, that e.g. during a media introduction or Restore the drive is exclusively allocated.

Non-Backup-, Restore, resp. Media init-Jobs as, e.g. `sm_start` for a drive, are processed in the queue `qu_all`.

### 3.3.3.12 Logging of the Queue Manager programs

The Logging of the Queue Manager programs is set in `ID/var/ini/debug.ini` (see 4.6.1):

```

...
SM_QM=0
SM_QM_MAIN=1
...
  
```

Then appears

```

{ID}/var/log/lgc/sm_qm.lgc
{ID}/var/log/lgc/sm_qm_main.lgc
  
```

## 3.3.4 The Database

**SEPsam** keeps its internal configuration- and run-time data in a database.

The corresponding DBF-files are stored under `{ID}/var/db/schema/sesam`.

The database is controlled by the DB-Server `sm_db_main` (see 3.5).

The table structure of the DB is not shown here explicitly, but can be requested if necessary from **SEP AG** as an SQL-file.

### 3.3. THE PROGRAMS OF THE SERVER

At the command level the DB can be accessed with SQL-Instructions using the program  
**{ID}/bin/sesam/sm\_db{.exe}**

#### Syntax:

sm\_db "SQL-Instruction"

sm\_db "SQL-Select-Instruction" export > File

=> Contents in the form of SQL-Insert-Instructions for Re-import

Another program for DB processing is

**{ID}/bin/sesam/sm\_dbf\_pack{.exe}**.

The DBF-files constantly grow in size because the deleted data sets are not actually deleted but only marked as deleted. To avoid that, the DBF-files can be "packed" with the help of sm\_dbf\_pack, t.m. the data sets which are marked as deleted will be really deleted.

Additionally the DBF-files can be analyzed.

#### Syntax:

sm\_dbf\_pack [p/P/a/A] {DBF-filename.dbf} {records file name}

p	pack all Sesam-DBF-files	no further arguments
P	pack the specified DBF	1 argument
a	analyze the specified DBF (output all bytes numbered)	1 argument
A	analyze the specified DBF (all records)	1 argument

The automatic day change of **SEPs sesam** (NEWDAY-Event) makes among other things the packing of all DBFs.

The execution can be suppressed through a change in the file {ID}/var/ini/sm.ini.

```
...
[SM_DBF_PACK]           # Section for sm_dbf_pack
AUTOSTART=YES           # YES -> execute sm_dbf_pack at NEWDAY
...
```

#### 3.3.5 Sesam Multi Stream - SMS

For the recording of Backup data a special Multi-Stream-Processing is used. This processing makes possible the simultaneous transfer of Backup data from several Backup clients to a single media. With this processing the drives can be used at corresponding higher data rates in the so called "streaming mode". The recording of data goes on with maximal recording speed, there are no stop- and repositioning times, the network load as well as the transfer times are reduced to a minimum.

Additionally at the beginning of a Backup and further in the process special marks (file marks) are written on the tape, which makes possible the extremely fast positioning to the Backup data in case of a Restore. This is especially important for the Restore of single files. With the implemented processing the tape is positioned directly to the last mark before the begin of the necessary data and the corresponding data is transferred over the stpd to the Backup client.

The implemented processing allows the recording of Backup data over tape boundaries, so that the Backup of any data quantities is possible (see 3.3.1.10).

In {ID}/var/ini/sms.ini are specified the execution parameters of SMS.

**Hint**

This file is automatically tuned by the SEPsam drive configuration program (sm-config-drives), when the drive configuration changes (GUI). The configuration is also performed again at Startup and at SEPsam day change.

```
[SMS_Device]
Maximal_Number_Of_Devices=2
Device_Name_0=disk1
Device_Name_1=/dev/nst0

[SMS_Disk]
Directory=/opt/sesam/var/ini/

[SMS_Tape]
Tapemark_Type_0=SETMARK
Tapemark_Type_1=FILEMARK
Default_Segment_Size=1000
Tape_Online_Timeout=120
Max_Retries_Num=20
Retry_Delay_On_1106=1
Max_Repeat_On_1106=20
Repair=TRUE

[SMS_Server]
Throughput_Interval=5
Alarm_Interval=30
Maximal_Number_Of_Parallel_Streams_0=9
Maximal_Number_Of_Parallel_Streams_1=9
Bin_Directory=/opt/sesam/bin/sms
Ctl_Directory=/opt/sesam/var/work/ctl

[SMS_Logging]
#Log_Levels=0 1 2 3 4 5 6
# -1=NO_LOG, 0=ERROR, 1=EMERGENCY, 2=WARNING, 3=NOTICE, 4=INFO, 5=DEBUG,
6=TRACE
Log_Levels=0 1 2 3 4
Log_Size=256
Log_Max_Files=10
Log_Details=0 1 2
Log_Directory=/opt/sesam/var/log/sms
Perf_Directory=/opt/sesam/var/work/info
```

### 3.3. THE PROGRAMS OF THE SERVER

---

The access to SMS-Media (Tapes, Disks) is performed with the STPD Service/Daemon (see 3.3.6) or with the **sm\_sms\_interface** program (see 3.3.1.9).

Loggings are written under the directory **{ID}/var/log/sms**

#### 3.3.6 Data transfer with SesamTransferProtocol - STP

The STPD (STPDaemon) **{ID}/bin/sesam/sm\_stpd\_main{.exe}** is used as a special FTP-Server for transfer of Backup data from the Client to the recording device (Tape- or disk drive) over SMS (see 3.3.5).

The STPC (STPClient) creates a data transfer connection to the STPD over the network.

The FTP-protocol is used for the transfer. This guarantees a high data throughput and the compatibility with all network components.

The data is transferred directly to the recording device, without intermediate storage (comp. german **SEPs sesam** Patent Nr. 4335836 and US-Patent Nr. 5,901,331).

A special analysis of the Backup data makes possible the recognition of errors, e.g. if during the Backup a file changes in size. At the beginning of Backup the file size is taken in the saveset. If the file size changes during the Backup, the analysis recognizes that and changes the file size so that the length specification remains consistent.

Additionally during the analysis the contents of the saveset (Listing) as well as the position data (Segment-Info) is written in special files.

The process **sm\_passd** is used by STPD for the authentication of system users (see also 3.5).

#### Syntax

Check with ftp, Default-Port: 11001, see **{ID}/var/ini/stpd.ini** STPD\_PORT

```
# ftp
ftp> open linux 11001
Connected to linux.sep.de.
220 STP Service Ready. Version: 2.8 R16. PID: 25854. Type HELP for list of
commands.
Name (linux:root): sms
331 Password required for sms.
Password:
230 User logged in, proceed.
Remote system type is Linux.
ftp>cd SMS:disk7:INQUIRE
250 CWD Command successful.
```

```
ftp> quote site inquire
213-SMS Inquire status begin
  STATUS:SMS_WRT
  OP_COUNT:BLOCKS:0.000000
  AMOUNT:BYTES:91553792.000000
  THROUGHPUT:GB/H:2.504883
213 SMS Inquire status end
ftp> bye
221 Service closing control connection.
```

### Hint

User must be STPD User sms or System User.

With `cd SMS:tape:login-type` the SMS Dataserver is connected.

The **tape** must be selected according to the entries in `{ID}/var/ini/sms.ini`, e.g. Tape0 (WNT), `/dev/nst0` (Linux), `/dev/nrmt0h` (UNIX) or `disk1` for DISK device.

As login-type `"SHARE"` is used for parallel Backups, `"EXCLUSIVE"` for Restores and `"INQUIRE"` for queries.

On errors react according to the error message

e.g. correct the input

or wait for resp. change the state of SMS Dataserver

On 'SMS not in allowed state' it is EXCLUSIVE (Restore) busy. In this case it is only possible to create a connection to the Dataserver with login-type `"INQUIRE"`.

### Backup Test

With the following FTP command a file can be transferred to the inserted media.

Put File Saveset:device:analyzer:tape ID:tapelabel:IP Buffer size

e.g. `put test.dat SF123:/dev/nvrmt0h:cpio:4:S00004:32`

analyzer none = no Analysis

cpio = cpio-Format

mtf = mtf-Format

### Restore Test

With the following FTP command a file can be read from the inserted media.

Get saveset:tape ID:segment Number:tape

z.B. `get SF123:4:0:4`

In `{ID}/var/ini/stpd.ini` are specified the execution parameters of STPD.

```
[STPD_Server]
STPD_PORT=11001                # TCP/IP Port
STPD_MAX_CONNECTIONS=64
Bin_Directory=C:\su\bin\sms
Ctl_Directory=d:\su\var\work\ctl
Work_Directory=d:\su\var\work
```

### 3.4. COMMUNICATION SERVER - CLIENT

---

```
[STPD_Thread]
STPD_BUFSIZE=4
DATA_TIMEOUT=900
AUTH_USERS=sms,PSL                # authorized user
UPDATE_THROUGHPUT=30
STPD_ACCEPT=TRUE
STPD_ID=THIS_IS_KEY
STPD_USER=root                    # _TMP_ allows access without User check

[STPD_Logging]
Log_Levels=0 1 2                  # max. 0 1 2 3 4 5 6
Log_Details=0 1 2
Log_Size=64
Log_Max_Files=10
Log_Directory=d:\su\var\log\sms

[STPD_Inquire]
InquireLog=d:\su\var\work\info\inq.log
Inquire_Timeout=10
```

#### Hint

The maximal number of SMS channels is limited to 64, i.e. for Backups maximum 60 SMS channels can be used. The remaining 4 channels are needed for administrative purposes, tape change etc..

Loggings are written under the directory {ID}/var/log/sms

## 3.4 Communication Server - Client

The command execution at the Client is performed according to the configured access method (GUI). Additionally options (e.g. -s for Single Port Option) can be configured (see 5.6).

The access methods for the SEPsasam proprietary CTRL and for the SecureShell (SSH) access are described below.

### 3.4.1 Command execution at the Client - CTRL-Service

The communication between computers is done over the **SEPsasam-CTRL-Services**, an own **SEP** development on TCP/IP-Basis.

Using a CTRL-Client `sm_ctrlc`, the CTRL-Daemon (= Server) `sm_ctrlld` on another computer can be contacted and **SEPsasam**-specific actions can be started.

The CTRLD is started on UNIX as Daemon, on WINDOWS as Service in the background. Using a proprietary protocol and the allowed nodes, users, directories and commands, stored at the Client, unauthorized usage can be avoided. The CTRLD-Program must therefore run under a Superuser-Account.

The access to CTRLD is configured in the file `{ID}/var/ini/sm.ini`:

```
...
[CTRLD_Server]                # Section name
CTRLD_Port=11301              # TCP/IP-Port of the STPD
Max_Connections=20            # max.connections
Bin_Directory=/su/bin/sesam   # Directory of sm_stpd\{.exe\}
Work_Directory=/su/bin/sesam  # Working directory; files may be copied
from/to it only
CTRLD_Path=/su/bin/sesam;/su/bin/sms # programs may be started in these
directories only

[CTRLD_Logging]               # Section name
Log_Directory=/su/var/log/lgc  # Directory for Logging files
Log_Level=0                   # 0 = no Logging; up to max. Level 6 poss.
Log_Details=0 1 2             # up to max. Level 3 possible
Log_Size=256                  # max. logging file size,

[CTRLD_Auth]                  # Section name
Auth_File=/su/var/ini/sm_ctrlld.auth # File, containing the authorized users
```

Entries in the authorization file `sm_ctrlld.auth` :

```
...
softnt6.sep.de root system SYSTEM # Computer name, User list
qswnt2000.sep.de root system SYSTEM # Computer name, User list
...
```

### **sm\_ctrlc**

Using the function `gethostbyname`, `sm_ctrlc` attempts to resolve the specified Hostname. If this hostname does not exist, `"-1"` is returned. In case of success, a connection is created to this hostname. The Port is used as an INET-Port and the command is used as a command for execution at the Remote Host.

The connection is created over a socket in the Internet Domain of type `SOCK_STREAM` (TCP-connection).

The caller gives its `STDOUT` to the remote command as `STDIN`. This command creates output on `STDOUT` and `STDERR`.

In case firewalls are used between the SEPs sesam Server and the Client, the port usage can be restricted with special options (`-s`, `-o port=...`) (see 5.6).

### **Syntax**

```
sm_ctrlc [-p port] [-l user] [-s] [-o port={first}-{last}] {host} {command}
```

*Input parameters:*

`{host}` Hostname of the Client

`{command}` Command to be executed at the Client

### 3.5. PROCESSES AND DATAFLOW

*optional Input parameters:*

```
-p port          # Listening Port of the remote CTRLD
-l user         # Remote User (see sm_ctrlld.auth)
-o port={first}-{last} # Port Range for Firewall usage
-s             # Communication over single Port only, i.e. over
Listening Port
```

#### Example

```
sm_ctrlc -p 11301 -l root qslinux1.sep.de sbc
```

#### 3.4.2 Command execution at the Client - SSH(secure shell)

Sesam can also use the ssh-protocol for command execution at the Backup Client. The requirements are, that at the Server an ssh-Client-program and at the Backup Client an sshd (Service/Daemon) is installed and the Server can login to the Client without a password as user *root* for UNIX and *system* for Windows.

This is achieved through the creation of a private and a public key on the Server and the transfer of the public key to the Backup client. Details can be found in the documentation of the corresponding SSH implementation.

In case firewalls are used between the SEPsesam Server and the Client, the port usage can be restricted with ssh options (see 5.6). The options are specified in GUI:Clients-Properties in the field "Access Options".

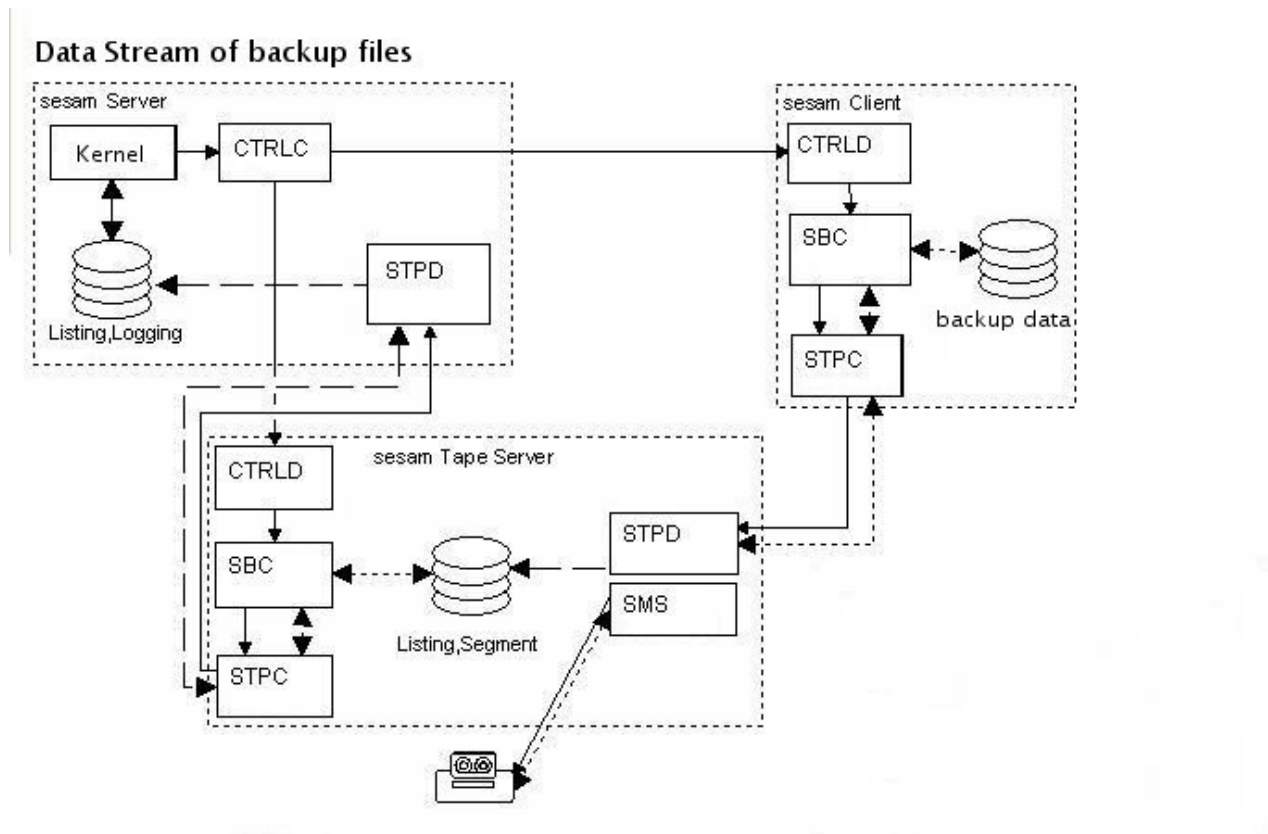
## 3.5 Processes and Dataflow

SEPsesam creates and uses the following background processes (Services):

sm_main\{.exe\}	Sesam main process
sm_sepuler\{.exe\}	SEPuler
sm_db_main\{.exe\}	Database
sm_qm_main\{.exe\}	Queue manager
java\{.exe\}	Java for GUI
sm_passd\{.exe\}	Access control
sm_ctrlld_main\{.exe\}	CTRLD-Daemon
sm_sms_main\{.exe\}	SMS Server
sm_data_server\{.exe\}	SMS Dataserver Drive 1
sm_data_server\{.exe\}	SMS Dataserver Drive 2
sm_stpd_main\{.exe\}	SesamTransferProtocolDaemon STPD

These processes are controlled with **sm\_main{.exe}**:

```
sm_main install # Set up the SEPsam Services, on Windows only
sm_main remove # Remove the SEPsam Services, on Windows only
sm_main start   # Start the SEPsam Server
sm_main stop    # Stop the SEPsam Server
sm_main restart # Restart the SEPsam Server
sm_main reload [main|node|sepuler|db|qm|rmi|sms|stpd|passd|ctrl]
                # Start again a specific process
sm_main status  # Status request for the SEPsam Server processes
```

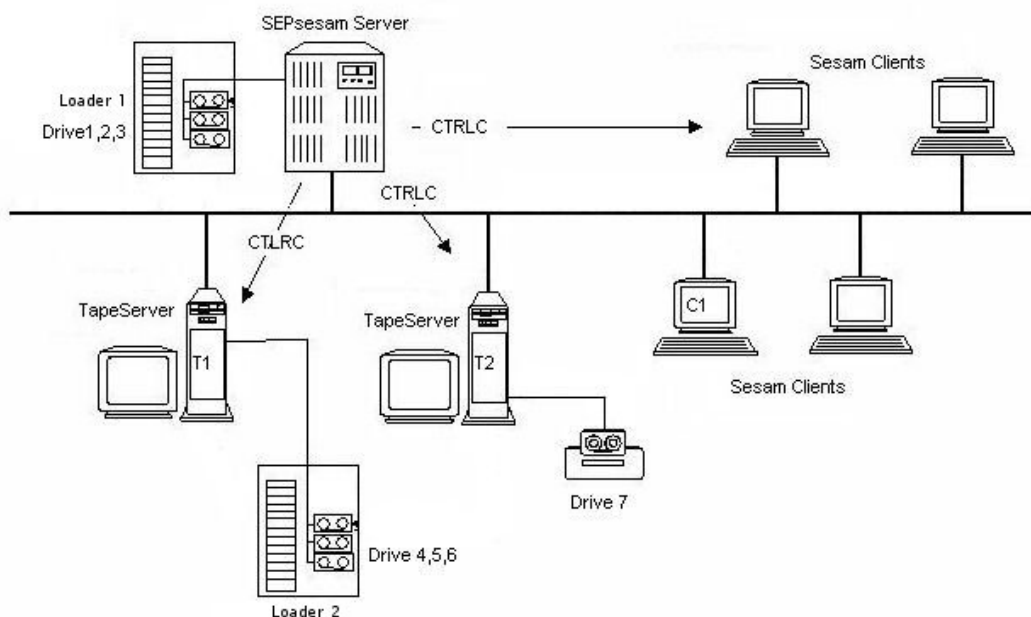


The picture shows the cooperation of the particular functional units, which are presented here in component view, i.e. they can be eventually combined on a single computer.

So the **SEPsam**-Server contains the Server- and Tape server components, a pure Backup Client - the Client-component only etc. .

The dataflow can be also distributed in any way between the source computers and the Tape servers, whereby the highest level of control always belongs to **SEPsam**.

### 3.6. GLOBAL VARIABLES (GLBV)



The above example shows a **SEPsasam-Server** with a local **Loader 1**, which serves 3 local drives 1,2,3.

Further, there is a computer **T1** with loader of the same type, as well as **T2** with a single drive and several Clients.

On **T1** and **T2** is installed the **TapeServer**-component, on **C1** - the **Client**-component.

In the configuration we have then **T1**, **T2** and **C1** as Clients, 2 loaders and 7 drives.

Through the configuration of Backup tasks the following dataflows can be created:

Client	Target drive	Data flow
C1	D1	from C1 to Drive1 at Server
C1	D5	from C1 to Drive5 at T1 (without loop over the Server)
T1	D4	from T1 to Drive4 at T1 (without loop over the Server)
T1	D3	from T1 to Drive3 at Server

The supplement data (Listings, Segment files etc.) are transferred from the **TapeServer** to the **SEPsasam-Server**.

## 3.6 Global Variables (GLBV)

For communication between programs special global values, the so called **GLBV** (global variables), are created by the **SEPsasam Server**. These values reside on **WNT-Systems** in the **WNT-Registry** and on **UNIX-Systems** in special files in directory **{ID}/var/glbv**.

### Attention

The setting resp. deletion of **GLBVs** can lead to severe system problems and may be therefore used by **System-Specialists** only.

With the program `{ID}/bin/sesam/sm_glbv` the GLBVs can be set, read and deleted.  
The syntax is available with the call `sm_glbv -h`.

### 3.7 Sesam Loader Utility SLU

With `sm_slu` can be controlled SCSI-II loaders under Windows NT, Windows 2000, DECUNIX, HPUNIX and LINUX.

When `sm_slu` is called without arguments, it outputs the following command overview. The output can differ from version to version.

#### Example

```
Usage:
Scan(0-7) for loaders and tapes:slu scan [bus]
Inquiry:                        slu <ID|dev> [-]i
Mode sense:                     slu <ID|dev> [-]s
Read element status:           slu <ID|dev> [-]e [s|d|p:num-num|full|empty]
Read element status with label: slu <ID|dev> [-]l [s|d|p:num-num|full|empty]
Move medium:                   slu <ID|dev> [-]m <s|d|p:num> <s|d|p:num>
Unload for tapes:              slu <ID|dev> [-]u
Load for tapes:                slu <ID|dev> [-]g
Rewind for tapes:              slu <ID|dev> [-]r
Allow removable for tapes:     slu <ID|dev> [-]a
Prevent removable for tapes:   slu <ID|dev> [-]p
Reset Semaphore File:          slu reset [ID|dev]
```

The particular options are described below.

#### 3.7.1 sm\_slu scan

For the **SEPsam** user is first helpful the command '`sm_slu scan`' for determination of the Device-ID (SCSI-ID, Bus, LUN, Target). The command lists all Device-IDs of the connected loaders and drives. The Device-ID is taken in the configuration of **SEPsam** for control of the loader.

The control of drives requires, that the corresponding drive number can be transferred to the loader. This assignment (relative drive number) must be specified at the configuration of the drive.

When the loader is not a compact device (e.g. TZ887) but a loader with standalone drives, the standalone drive must be explicitly opened for unload. This unload is also performed with a `slu`-command. Here the SCSI Device-ID should be configured for the corresponding drive.

#### Example UNIX

### 3.7. SESAM LOADER UTILITY SLU

---

STK-Loader with 2 Drives (3 SCSI-Devices)

```
bash-2.02# sm_slu scan
```

```
ID=310 Tape:    QUANTUM DLT4000          2255 (/dev/nrmt0h)
ID=340 Tape:    Quantum DLT4000          CF5F (/dev/nrmt1h)
ID=360 Loader:  STK      9730            1205
```

In the brackets appears the device name, which must be entered in the **SEPs**sesam drive configuration.

**sm\_slu 360 -e scsi** shows then the drive numbering within the loader:

```
ID=340 Tape Drive 0 in Loader 360
ID=310 Tape Drive 1 in Loader 360
```

#### Example Windows

TLZ9-Loader with 1 Drive (1 SCSI-Device)

```
bash-2.02# sm_slu scan
```

```
ID=0000 other: WDC AC22000L          32.4 (HardDisk)
ID=0010 other: FUJITSU MPC3084AT      6021 (HardDisk)
ID=1000 other: LITEON DVD-ROM LTD163D GHR3 (CdRom)
ID=2050 Tape:  DEC      TLZ9          (C) DECA035 (Tape0)
ID=2051 Loader: DEC      TLZ9          (C) DECA035 (Loader)
```

The device name for ID=2050 is Tape0 (can be found in the Registry), the combination of Tape0 and Loader can be seen from the identity of SCSI-ID, Bus and LUN (=205), i.e. the drive and the robot unit are controlled over the same SCSI-channel.

#### 3.7.2 sm\_slu inquiry

With the option "-i" the producer and type of the device can be inquired. This command can be also used to check if the device is properly connected and working.

#### Example

```
sm_slu 360 -i
ID=360 Loader: STK 9730
```

#### 3.7.3 sm\_slu mode sense

Used to query the loader state resp. to return the last error state.

#### Example

```
sm_slu 360 -s
1 x Transport First=1000
30 x Slot First=0
1 x Port First=1010
2 x Drive First=1030
```

### 3.7.4 sm\_slu read element status

With this option a list of all elements (Slot, Drive, Transport, Port) and their filling is produced.

#### Example 1

```
sm_slu 360 -e full
Slot 0(adr= 0,src=1030,tape=1) 1=full
Slot 2(adr= 2,src= 4,tape=1)
Slot 8(adr= 8,src=1030,tape=1)
Slot 9(adr= 9,src= 0,tape=1)
Slot 10(adr= 10,src=1031,tape=1)
Slot 0(adr=1030,src= 1,tape=1)
```

#### Example 2

```
sm_slu 360 -e empty
Slot 1(adr= 1,src= 0,tape=0) 0=empty
Slot 3(adr= 3,src= 0,tape=0)
Slot 4(adr= 4,src= 0,tape=0)
Slot 5(adr= 5,src= 0,tape=0)
Slot 6(adr= 6,src= 0,tape=0)
Slot 7(adr= 7,src= 0,tape=0)
Slot 11(adr= 11,src= 0,tape=0)
Transport 0(adr=1000,src= 0,tape=0)
Port 0(adr=1010,src= 0,tape=0)
Drive 1(adr=1031,src= 0,tape=0)
```

#### Example 3

```
sm_slu 360 -e s:0 s=slot
Slot 0(adr= 0,src=1030,tape=1)
```

#### Example 4

```
sm_slu 360 -e d:0 d=drive
Drive 0(adr=1030,src= 1,tape=1)
```

#### Example 5

```
sm_slu 360 -e p:0 p=port
Port 0(adr=1010,src= 0,tape=0)
```

### 3.7.5 sm\_slu read element status with label

This option produces a list with all elements (Slot, Drive, Transport, Port) and their filling with media labels as well.

#### Example

sm\_slu 360 -l full l=label; further parameters as before

```
Slot 0(adr= 0,src=1030,tape=1) S00001
Slot 2(adr= 2,src= 4,tape=1) S00100
Slot 8(adr= 8,src=1030,tape=1) S00004
Slot 9(adr= 9,src= 0,tape=1) S00005
Slot 10(adr= 10,src=1031,tape=1) S00101
Drive 0(adr=1030,src= 1,tape=1) S00003
```

### 3.7.6 sm\_slu move media

With this option media can be moved. As target and source a loader element (Slot, Drive, Port) can be selected. This function can change the filling, measured by **SEPs**esam (!) and therefore should be only used with respect to the media-archive (comp. 3.3.1.5).

The unload of drives requires eventually a previous 'Unload'-command for the corresponding drive.

### 3.7.7 sm\_slu unload for tapes

With this option drives can be unloaded. The media is rewound and ejected. Available drive doors are opened (the drive is then set to the "offline"-state).

This option should not be confused with the 'Unload' of sm\_loader (see 3.3.1.5).

### 3.7.8 sm\_slu load

With this option "offline" media in the drive can be set "online" again.

### 3.7.9 sm\_slu rewind

With this option media in the drive can be rewound.

### 3.7.10 sm\_slu allow removal

With this option a drive, locked with "prevent removal" can be released again.

### 3.7.11 sm\_slu prevent removal

With this option drives can be locked. The unload of media in the drive with the control elements of the drive ("Unload" button of the drive) is blocked. With the option "allow removal" the lock can be removed.

### 3.7.12 sm\_slu reset

To avoid the parallel execution of SCSI commands, slu uses internally a semaphore mechanism. It creates for the duration of the SCSI call a lock file for the corresponding SCSI-ID. If the command is terminated in this phase, the lock file remains.

With the command call slu SCSI-ID reset the lock file is removed.

## Chapter 4

# Protocols and Listings

**SEPsesam** creates on the Sesam-Server a number of protocols, which give information about the work and the status of Backups and Restores.

### 4.1 Status protocol

For each SEPsesam Backup day, this is the period of time which is fixed by 2 following SEPsesam day changes, a status protocol is written. Here for each Backup task comes an entry about the end status of the Backup in a file with the beginning date of the SEPsesam Backup day **{ID}**/var/prot/{yyyymmdd}.status.

In the user interface (GUI) can be found under: Protocols-Status

At the beginning of each row a flag is set with the following meaning:

0 successful  
1 successful, but with warnings  
2 Listing incomplete  
3 terminated  
c terminated by user (GUI)  
X Fatal error

#### Example

Start of SESAM Backup day at 2002-11-12 08:00:52 Tue (softnt6)

```
-----  
0 DISASTER\_0      D:4 2002-11-12 20:05:37 successful without warnings  
0 DISASTER\_1      D:4 2002-11-12 20:09:49 successful without warnings  
0 NT6\_E1          D:4 2002-11-12 23:41:38 successful without warnings  
0 NT6\_E3          D:4 2002-11-12 23:41:38 successful without warnings  
0 NT6\_E2          D:4 2002-11-12 23:41:39 successful without warnings
```

## 4.2 Daily protocol

Chronological report about the activities of a SEPsasam Backup day in the file `{ID}/var/prot/{yyyymmdd}.prt`.

In the user interface (GUI) can be found under: Protocols-Daily protocol

The following information is written in the protocol:

PID	Process Identifier
Identification	unambiguous identification of the message with Severity+Number-Modulename
Severity I	Information
Severity W	Warning
Severity E	Error

### Example

Timestamp	Identification	PID	Text
2002-11-12 08:00:52	I001-STARTAL	[ 1300]	: Date identification: 20021112
2002-11-12 08:00:54	I002-START	[ 4131]	: the terminated BACKUP tasks...
2002-11-12 08:00:55	I002-START	[ 4153]	: the terminated BACKUP tasks...
2002-11-12 08:00:55	I002-STARTAL	[ 1300]	: START_ALL finished
2002-11-12 08:00:58	I001-START	[ 4153]	: START on drive 5 finished
2002-11-12 08:00:59	I001-START	[ 4131]	: START on drive 4 finished
2002-11-12 08:05:06	I007-SEPULER	[ 4467]	: start event sepuler_event.c...
2002-11-12 08:05:08	I003-MEDIA	[ 2350]	: INIT_4 Initialization of a Me...

## 4.3 Backup protocol

Detailed information about a Backup run, e.g. SBC-messages, not saved files, FTP-connect-messages, End status etc.

`{ID}/var/lis/{Taskname-yyyymmdd.seqnr}-{S}{T}.no t`

Taskname	as configured in the GUI
yyyymmdd	Date of the Backup day
seqnr	sequential number rel. to the Backup day
S	Backup type S (SMS), X (Command event) or external identifier for INFORMIX, ORACLE, SAP, etc.
T	Backup level, for SMS: F, D, I, or C

In the user interface (GUI) can be found under:

Backups-by Status-selected task-Properties-Protocol

or by clicking the corresponding Backup in the calendar sheet.

## 4.4 List of the saved files

List of all saved files of a Backup task (Backup journal).

`{ID}/var/lis/{Taskname-yyyymmdd_seqnr}_{S}{T}.lis`

### Example

Contents of a LIS file:

```
...
'''home/bfa/lib/''' d 22.06.2000 03:22:29 22.06.2000 03:22:29 3 528 652
'''home/bfa/lib/einsaeetze2''' f 22.06.2000 03:22:23 22.06.2000 03:22:23 3 652 788
...
```

Used in the GUI in the Restore wizard to build the selection tree for a selective Restore.

## 4.5 Segment files

Partner file of the equally-named .lis-File. Here are stored the media and the segments on which the saveset was written.

`{ID}/var/lis/{Taskname-yyyymmdd_seqnr}_S{T}.sgm`

### Example

```
SAVESET: SD20000622110016 TAPEID: 14 SEGMENT: 3
14:0:3:S00014:3555
14:116230016:4:S00014:1501
```

## 4.6 Analysis protocols - Logging

For analysis and protocol purposes all **SEPs**esam programs have an integrated Logging Mechanism, i.e. the programs protocol their work in files under `{ID}/var/log`.

The scope of these loggings can be specified by the user.

### 4.6.1 Logging of the Kernel programs

The scope of logging files can be specified by the user in the file `{ID}/var/ini/debug.ini`.

In this file is therefore set the program name (in capital letters) and the logging level, e.g. `SM_RESTORE=1`.

The meaning of logging level is the following:

0 = Do not create logging file

1 = Standard - arguments, subroutine calls, important variables

2 = Detail - additional output for problem analysis

With the entry under

[VERBOSE]

STDERR=0

is the logging, for "STDERR=1", additionally also written to stderr. This can be helpful for command line calls.

The files are stored under {ID}/var/log/lgc/\*.lgc and upon day change renamed to \*\_Date'.lgx. They have the following format:

```
8:05:24# Logging enabled for module SM_SEPUL_EVENT (PID=1171), parent proc

8:05:24# +++ ARGUMENTS $Id: sm_sepul_event.c,v 1.114 2002/10/24 10:03:09 P
8:05:24# --- ARGUMENTS
8:05:24# +++ MAIN:
8:05:24#     +++ CHECK_PERMIT at 2002-11-10 08:05:24
8:05:24#         Check if sepuler is passing a term with deleted event des
8:05:24#     +++ CHECK_HIGHER_PRI0    1 M Disko_ 5 0 1
8:05:24#         +++ FILL_SCT_MEDIA_TERM descript:Disko_ 5 0 1 #
8:05:24#             Mediapool: Disko_ optional Drive-number: 5
8:05:24#         +++ i_GET_DRIVE_GROUP for media pool Disko_
8:05:24#             select grp_name from drive_groups, media_pools
8:05:24#         +++ DB_ACCESS id=get_drive_group SQL=select g
8:05:24#             --- DB_ACCESS returns 1 msg=1
8:05:24#         --- i_GET_DRIVE_GROUP: LocalDisk (1 rows)
8:05:24#         --- FILL_SCT_MEDIA_TERM drvgrp:LocalDisk grpflg:0 dn:
8:05:24#             get starting-time of surrounding NEWDAys
8:05:24#         +++ DB_ACCESS id=CHECK_HIGHER_PRI0 SQL=select start f
8:05:24#             --- DB_ACCESS returns 1 msg=37
```

With '+++' and indent is marked the entry in a subroutine, with '---' - the exit from it.

#### 4.6.2 sm\_db\_main Logging

The Logging-settings can be changed for Windows in %systemroot%\openrda.ini, for UNIX in \$OPENRDA\_INI.

The logging here is also named Tracing.

[CLIENT]

Tracefile = Path and name of the trace file (Default ..\work\oaclient.log)

[TRACECLIENT]

ALL = (Default FATAL | SNO | ERRORS) see list Tracing Options

[SERVER]

Tracefile = Path and name of the trace file (Default ..\work\sm\_db\_main.log)

TraceOptions = (Default all:f) see list Tracing Parameters and Options

## 4.6. ANALYSIS PROTOCOLS - LOGGING

---

[OLEDB / ODBC32]

Tracefile = Path and name of the trace file

TraceOptions = 0-2

0=FATAL|ERROR|SNO

1=Function level tracing

2=most detailed tracing level

**Server Module (for oaisql and sm\_db\_main)**

```

ALL      = Trace settings for all modules\\
SESS     = Session layer tracing\\
RTP      = Encode / decode tracing\\
XM       = Memory\\
AL       = Association\\
RDA      = RDA protocol\\
SUR      = Sequence rule\\
AE       = Application entity\\
PRESS    = Presentation layer\\
CLI      = CLI layer\\
SAO      = Reserved for ATI\\
SACF     = Reserved for ATI\\
RDAAASE  = Reserved for ATI\\
SQLS     = Database server layer (only for local configuration)\\
SQLD     = Enable tracing in the Ips (only for local configuration)\\

```

### Setting Server Trace Flags

The trace output for the Server is performed according to the selected Server module plus the corresponding trace level, which is specified using a bit field.

#### Example

Tracing for "all" mit bit field "f", i.e. FATAL—SNO—PARM—ERRORS

and tracing for Server module Session Layer with "1ff", i.e. all messages.

TraceOptions = all:f sess:1ff

### Server Trace Flag Settings

Flag	Description	Bit Mask
MAX	All tracing options set	0x1ff
FATAL	Fatal errors	0x001
SNO	Should not happen conditions	0x002
PARM	Invalid parameters	0x004
ERRORS	General errors	0x008
MAJOR_EV	Major network event	0x010
MINOR_EV	Minor network event	0x020
INFO	Informational trace	0x040
F_TRACE	Function trace	0x080
TRIVIA	Trivial messages	0x100
TIMESTAMP	Time stamp function calls	0x200

### 4.6.3 SMS/STPD Logging

The scope of logging-files can be specified by the user in the files `{ID}/var/ini/sms.ini` resp. `./stpd.ini`.

Possible values are:

0=ERROR, 1=EMERGENCY, 2=WARNING, 3=NOTICE, 4=INFO, 5=DEBUG, 6=TRACE

These are specified in the INI-files under the section `[SMS_Logging]` resp. `[STPD_Logging]` in the following Form:

`[SMS_Logging]`

`Log_Levels=0 1 2 => up to Level 2 (Example)`

`[STPD_Logging]`

`Log_Levels=0 1 2 3 4 5 6 => up to max.Level 6 (Example)`

The logging-files are stored under `{ID}/var/log/sms`.

## Chapter 5

# Administration

### 5.1 Start and stop the Server

**SEPs** offers a simple interface to start and stop the server.

The system is equally started with **sm\_startup** (e.g. Reboot of a W2K Server) as well as with **sm\_main start** (e.g. Start over the command line).

This is achieved in the following way. During the processing of "sm\_main start" after the start of all Daemons resp. Services, the common sesam-processing queue qu\_all is initialized and then the program sm\_startup is started there. sm\_startup checks the **SEPs** environment and starts sm\_config\_drives for Initialization of the drives.

If the **SEPs**-Server is started with "sm\_startup", it checks with "sm\_main status" if the Daemons resp. Services are active. If they are not active, "sm\_main start" is called and sm\_startup terminates prematurely.

The command to stop **SEPs**-Server is **sm\_shutdown** which calls **sm\_os.startup stop**. It then uses a.o. sm\_main stop to stop the Services/Daemons.

### 5.2 Reboot configuration (automatic start)

**SEPs** is designed so, that it starts automatically after the system boots. To suppress that, the following steps are needed:

**Under Unix-Systems.**

Change to the /bin/sesam-directory and enter **sm\_setup unset\_reboot**. To enable the service again, enter **sm\_setup set\_reboot**.

**Under Windows-Systems:**

WNT: Start-Settings-Control Panel-Services.

Select **SEPs**sesam Server resp. **SEPs**sesam Tape Server. Select Start type, then select "Disabled". The service sesam Multiplexing Server 0. must be disabled as well.

Windows 2000 / Windows XP: Start-Settings-Control Panel.  
Then go to folder "Administration" and select "Services". Double click on **SEPs**sesam Server resp. **SEPs**sesam Tape Server; for Start type use "Disabled".

### 5.3 Functionality check

To check **SEPs**sesam components it is sufficient to use the display **GUI:current messages???** and to start a Backup task from the GUI (Immediate start Backup). The Backup should run and show throughput quantities. The functionality check was successful, when the Backup finishes successfully.

#### Functionality check sequence

GUI: Display "current messages"

Possible RMI errors:

RMI Server at SEP sesam Server does not have socket connection to <Service-Address> <Port>

GUI: Immediate start Backup

Possible database errors:

ODBC/sm\_db\_main Connection to database failed

Possible SEPuler errors:

sepuler Backup will not be started

Check over Schedules => Events

The event should disappear at the latest 1 minute after execution

Possible Queue Manager errors:

Queue Manager Backup will not be started

Check over "Monitoring drives"

Check the process sm\_qm\_main and if necessary repeat sm\_startup

SM-commands for Backup

Possible CTRLC/SSH errors:

sm\_ctrlc Connection to the Client not possible

Check the name resolution (Name and Address)

Check if the Client is reachable

Check if the Client is reachable over CTRLC/SSH

Check sm\_ctrlc at the Client, if it is active at the right port

Check sm\_ctrlc/ssh connection from the command line

Possible SBC errors:

Check the sbc-component at the Client

Possible STPD errors:

Check stpd at the server

Check FTP-errors in the Backup protocol

1. Check daemon and process list
2. Check FTP-connection with ftp Host 11001, e.g. ftp A0032 11001

Possible SMS errors:

Check SMS Dataserver

Check sms-errors in the Backup protocol

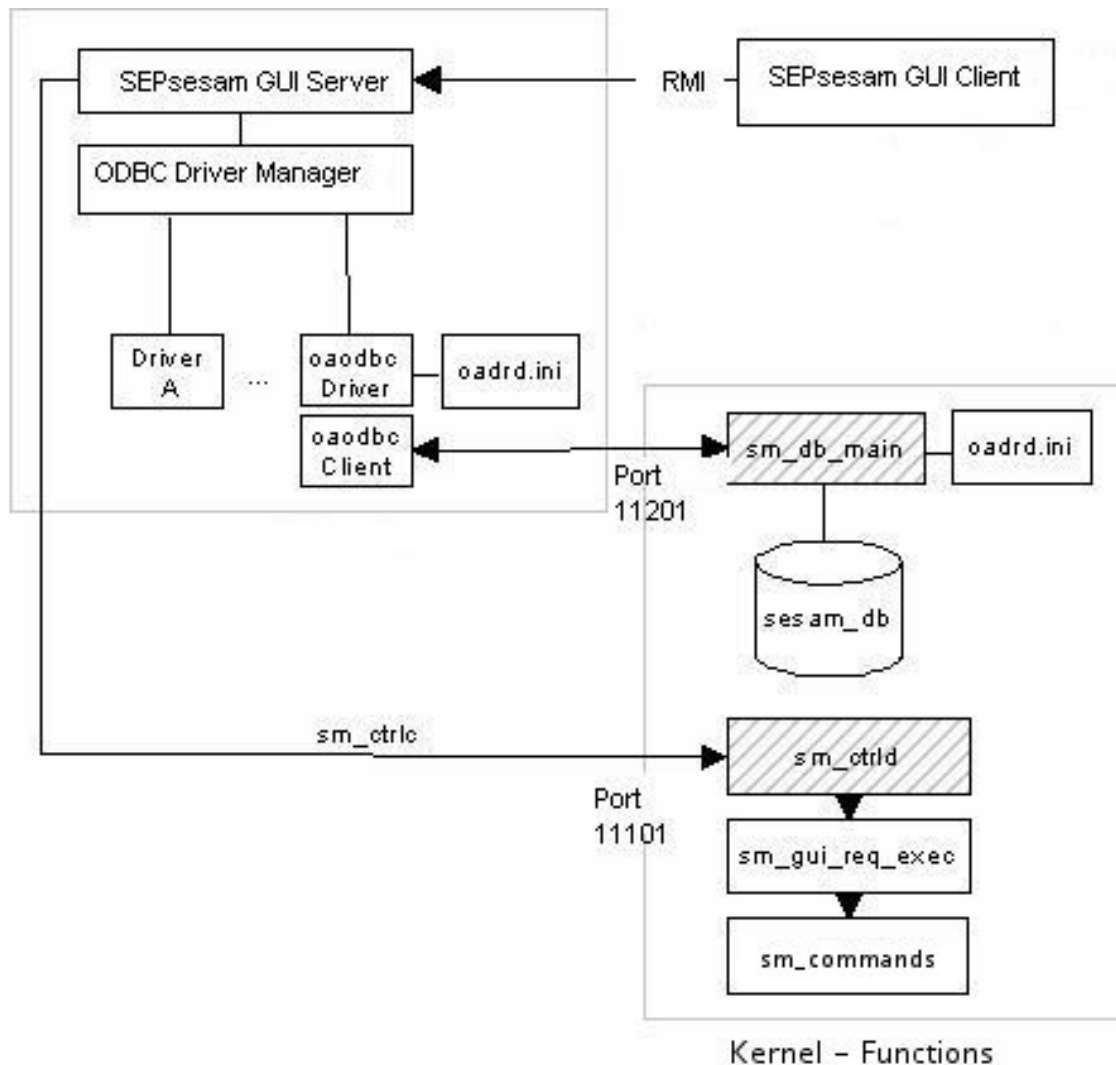
Check SMS Dataserver in the process list

If necessary increase the log-level and check the logging

## 5.4 GUI-Server Administration

For the ODBC-access an ODBC Driver Manager as e.g. odbc32 (Standard) on WNT, Intersolv Driver Manager on Compaq, unixODBC on LINUX is necessary at the GUI-Server-computer. The Driver Manager controls all ODBC-datasources. For the **SEPs**sesam database a datasource "sesam\_db" must be configured.

The datasource is contacted over the oaodbc Driver and the oaodbc Client. This Client communicates with the **SEPs**sesam database server (sm\_db\_main) and the corresponding datasource at the server.



#### ODBC-connection

The requirements are automatically fulfilled upon a server installation.

#### 5.4.1 GUI-Server commands

A call of an interaction is redirected from the GUI over the RMI and from the RMI Server over CTRL to the module `sm_gui.request`. It prepares the parameters for the function calls and starts the necessary program.

The SEPsesam programs and the corresponding interactions for each GUI-component (Title bar, lower windows, etc.) are listed below.

## 5.5. ACCESS RESTRICTION FOR COMMAND EVENTS

	<b>in the Menu- and the Symbol bar</b>
sm_restore	execute Activities-Restore-Start
sm_search_lis	Activities-Restore-Search for files
sm_lis_db	Activities-Restore-Build the tree for selective Restore
sm_sho stream file pre	Configuration-Interfaces-Pre
sm_sho stream file post	Configuration-Interfaces-Post
sm_sho stream file alarm	Configuration-Interfaces-Alarm
sm_sho stream file disaster	Configuration-Interfaces-Disaster
	<b>in the lower display window</b>
sm_sho stream cur	cyclic running display
sm_break	Terminate Backup resp. Restore
	<b>in the object tree ()left window</b>
sm_remote_tcpip	Components-Topology-new Client-UNIX
sm_remote_wnt	Components-Topology-new Client-WNT
sm_inventory	Components-Loader-Contents-Archive adjustment
sm_loader	Components-Loader-Loader action
sm_config_loaders	Components-Loader-new Loader/Drive delete
sm_config_drives	Components-Drives-new Drive/Drive delete
sm_arch new	Components-Media-New
sm_arch rel	Components-Media-Delete
sm_cal_sheet	Scheduling-Calendar sheet
sm_sho stream pre	Backups-by Status-Select Saveset-Pre
sm_sho stream post	Backups-by Status-Select Saveset-Post
sm_sho stream not	Backups-by Status-Select Saveset-Protocol
sm_daily_schedule	Scheduling-Schedules-Properties create/change
sm_process_sts	Monitoring-Processes
sm_drive_sts	Monitoring-Drives
sm_sho stream statprl	Protocols-Status
sm_sho stream sesamprl	Protocols-Daily protocol
sm_sho stream lic	License info

## 5.5 Access restriction for Command events

### 5.5.1 Problem description

The Command event makes possible the execution of any programs at the Backup Client. For security reasons the execution must be restrictable. The access security of a computer is a responsibility of the corresponding system administrator: Only he may issue resp. disable an access right.

For access restriction on UNIX-systems files are created at the computer, which explicitly allow resp. disallow an access, as e.g. the file /etc/ftpusers.

The following sequence was established based on its simplicity and robustness:

- simple modification of the access rights through modification of the file
- simple overview of the actual rights through output of the file
- secure management through exclusive root-access, files in ”’/etc’” can be edited by ’root’ only.

For access restriction on WNT-Systems, entries in the registry can be used. The Registry respects all WNT-user rights and allows access to entries according to the corresponding rights only. A surveillance of the entries is supported.

### 5.5.2 Command restriction on UNIX-systems

For the restriction of **SEPs** command events, the file `sesam.cmdusers.allow` in directory `/etc` is used.

A command event can be executed only, if the user as well as the file name of the program to be executed are present in `/etc/sesam.cmdusers.allow`.

Format of the file `/etc/sesam.cmdusers.allow`:

```
{user} {command} | *
```

#### Examples

a) Access for user oracle program `sm_oracle_client`:

```
oracle sm_oracle_client
```

b) Access for user informix with any program:

```
informix *
```

The command execution is always performed with the selected user only

```
su - {user}
```

#### Hint

The login scripts of the user, e.g. `informix/.profile`, should not wait for interactive input, e.g. ”’Select the database with 1 or 2’”. Such waiting for input would block the command execution.

### 5.5.3 Command restriction on WNT-Systems

For the restriction of **SEPs** command events, the Registry-entries under `HKEY_LOCAL_MACHINE/SOFTWARE/SEP Elektronik GmbH/sesam/CommandEvents` are used. Each user maps to a folder, the program to be executed - to a key with any value. Additional information for the command release can be specified as a key value.

### Hint

The folder CommandEvents may be only supplied with the mandatory access rights, in order to avoid undesired access!

A command event can be executed only in case, that the user as well as the name of the program to be executed are present.

If an '\*' is specified as a Program Key, then any commands can be executed.

Special case - command "cmd":

In case a CMD-command (MS-DOS command interpreter), e.g. `cmd /c dir c:\` is specified, first the Registry key `cmd` is searched. If it is not defined, then the corresponding subcommand, in our example `dir`, is searched.

### Examples

a) Access for user oracle program `sm_oracle_client`:

Key

`HKEY_LOCAL_MACHINE\SOFTWARE\SEP Elektronik GmbH`  
`/sesam/CommandEvents/oracle/sm_oracle_client`  
necessary with any value.

b) Access for user informix with any program:

Key

`HKEY_LOCAL_MACHINE\SOFTWARE\SEP Elektronik GmbH/sesam/CommandEvents/informix/*`  
necessary with any value.

c) Access for user Achim with any CMD-command:

Key

`HKEY_LOCAL_MACHINE\SOFTWARE\SEP Elektronik GmbH`  
`/sesam/CommandEvents/Achim/cmd`  
necessary with any value.

## 5.6 Configuration of a Firewall

SEPs sesam makes possible the restriction of used ports for the implementation of Firewalls.

### Field `clients.access_options`

The value of this field (e.g. `-s, -o port=first-last`) is used directly for the remote call. This field is freely editable (GUI) because the options which make sense are very different for the different access types (CTRLD, SSH).

Example about CTRLD: With Port Range (`-o ...`) appears the following sequence:

SESAM Server	FireWall	Client
		CTRLD_MAIN listening on Port
{ctrld_port}		
SM_CTRL_C		
Source Port=random first free		
Port		
Source Port for CTRLD Client		
=first free Port at the Client		
from {first_port}-{last_port}		
Default unrestricted		
Target Port={ctrld_port}		
SM_CTRL_C selects a local Port		
and connects to		
CTRLD_MAIN:{ctrld_port}		
SM_CTRL_C proposes the range		
for the further communication		
		within the specified range:
		CTRLD listening on the first free Port
(stderr)		
		CTRLD listening on the second free Port
(stdin)		
		CTRLD listening on the third free Port
(stdout)		
		is transferred from CTRLD_MAIN to
SM_CTRL_C		
SM_CTRL_C selects further 3 Ports		
and connects to the Ports		
of CTRLD at the Client		

The further communication is done over these 3 Ports.

Example about CTRLD: With Single Port Range (-s) appears the following sequence:

SESAM Server	FireWall	Client
		CTRLD_MAIN listening on Port
{ctrld_port}		
SM_CTRL_C		
Source Port=random first free		
Port		

## 5.6. CONFIGURATION OF A FIREWALL

Source Port for CTRLD Client		
=over {ctrld_port}		
(single port)		
Target Port={ctrld_port}		
SM_CTRLC selects a local Port		
and connects to		
CTRLD_MAIN:{ctrld_port}		
SM_CTRLC proposes a single port		
for the further communication		
		CTRLD listening on {ctrld_port} stderr,
stdin		and stdout
		is transferred from CTRLD_MAIN to
SM_CTRLC		

Further communication over this port.  
Specification of Source Port:

```
-s # single port communication
-o port={first_port}-{last_port}
```

Specification of Target Port:

```
-p {ctrld_port}
```

### Fields `clients.stpd_options` and `clients.stpd_port`

There are stored first: the destination port of the STPD Server and second: the source ports of sbc in the following format:

For a Client with firewall restriction: `clients.stpd_options: [first_port-last_port] # Default: NULL`

For a Tape Server with special STPD port: `clients.stpd_port: [stpd_port] # Default: NULL (== 11001)`

The specifications are optional. The value in these fields is used for the sbc call.

Example about STPD:

Client	FireWall	Tape Server
		STPD_MAIN listening on Port {stpd_port}
SBC		

Source Port=first free Port		
from {first_port}-{last_port}		
Default unrestricted		
Target Port={stpd_port}		
sbc/XBSA selects a local port		
from Range and connects to		
STPD_MAIN:{stpd_port}		
sbc connects to the next		
free port in Range and proposes		
it to STPD		
listening SBC/XBSA		
		STPD connects from any Source Port
		to the proposed Target Port (active
FTP)		

Further communication over target Port stpd\_port FTP Control Port source Port from Range FTP Data Port

It is a convention, that sbc uses 2 subsequent ports only. From this follows: If the first port is busy then a further attempt is made with the over-next port.

Specification per Option -S -S tape\_server[:stpd\_port[,first\_port-last\_port]]

### Firewall configuration SESAM-Server to Client

Sesam Server in the local network (Access to the Client):

incoming calls: Do not allow incoming connections!

outgoing calls:

1. Case: single port: Allow for the Sesam-Server a connection from any Source Port to the Client ctrld\_port
2. Case: port range: Allow for the Sesam-Server a connection from any Source Port to the Client ctrld\_port and first\_port-last\_port

### Firewall configuration Tape-Server to Client

Tape Server in the local network (Data transfer from the Client to the Tape Server):

incoming calls: Allow for the Client a connection from Source Port first\_port-last\_port to the Tape-Server stpd\_port

outgoing calls: Allow connection from Tape Server any Source Port to the Client first\_port-last\_port

## 5.7 Configuration Master Server

For the configuration of **SEPs** Server as a Master Server, an entry in the database table **defaults** is necessary.

```
sm_db '''insert into defaults (key,value,user_name) values ('mastersesam',1,'sesam')'''
```

```
sm_db '''delete from defaults where key='mastersesam'''
```

 makes **SEPs** normal server again.

**Attention: This function needs a license!**

## 5.8 Licensing of the SEPs-Server

The **SEPs** Server is licensed after time, computer name and TCPIP-Address.  
In {ID}/var/ini/sm.lic.ini are stored the licensed values and their encrypted variants.

License categories: TIMEOUT = Runtime in days since installation  
SERVER = Name of the sesam Server  
TCPIP = TCPIP-Adresse of the sesam Server

A negative result of the license check blocks the execution of Backups.  
Restores from already performed Backups are however always possible.

In case TIMEOUT ≤ 30 days, it is checked independently of SERVER & TCPIP (Demo license).

In case TIMEOUT > 30 days, then also SERVER & TCPIP are checked.

Upon inconsistencies through evtl. renaming of the computer or changed TCPIP-Address the TIMEOUT is reduced to 7 days, to allow the user to contact his responsible Distributor resp. **SEP AG (support@sep.de)** in an acceptable period of time.

Manipulation in the license file has the effect, that the TIMEOUT is set to 0, i.e. the system is immediately locked.

The license check begins *10 days before the end of the licensing* with the sending of warnings over the SESAM-Alarm interface, in the daily protocol and to the GUI.

Upon licensing problems please immediately contact **support@sep.de**, further information can be found under **www.sep.de**.



## Chapter 6

# Disaster Recovery

As disaster is considered here the destruction of the **SEPs**esam-Server itself and its data. To prepare for this case we have in **SEPs**esam the so called Disaster-Interface.

The control concept is the following:

- The Backup server backs up its own data with normal standard Backups
- the meta-data for these Backups is copied to other systems, so that it, in case of disaster, is available for a Restore via **SEPs**esam.

After the installation of **SEPs**esam in its var-directory resides a file `./var/skel/templates/sm_disaster` (`sm_disaster.cmd` in Windows), which the user can copy to `./bin/sesam/sm_disaster` (`sm_disaster.cmd`) and can edit up to his wishes.

This procedure is executed by all Backups, whose names contain 'DISASTER' or 'SESAM' in case of success. 2 arguments are transferred along:

- the label of the currently used media
- the complete Restore command, with which the data of the saveset can be restored.

The **Disaster strategy** then looks as follows

- the user sets up at least 1 Backup with a suitable name (e.g. `SESAM_BACKUP`), which saves the var-directory of **SEPs**esam (so are saved Listings, Loggings, Database, INI-files, etc.)
- This Backup should run daily with mode COPY or FULL.
- The user programs `sm_disaster(.cmd)` in a way, that the contents of both input arguments are copied from **SEPs**esam computer to other computers at specific places (Emails, file copies, Diskettes etc.). So the information, when and on which media was performed the last own Backup of **SEPs**esam, is available.

In the real case, after the computer is repaired, the following steps are necessary:

- Re-install **SEPs** from the distribution kit
- at the defined place find out, which media contains the last own Backup of **SEPs** and, if desired, copy that information in a procedure file (e.g. `sm_disas.sh (.cmd)`)
- Insert the media in the drive and execute the Restore command or start `sm_disas.sh (.cmd)`

### Example

The meta-data of the Disaster interface looks as follows:

SESAM\_00003 d:/Programme/SEPs SC20020710200512

`sbc -r -l full -o over -S softnt6:11001 -d SMS:Tape0 -t SESAM_00003:3 -s SC20020710200512 -n 5 -R /`

SESAM\_00003 is the media

d:/Programme/SEPs is the source path

SC20020710200512 is the saveset on the media

`sbc -r ...` is the Restore command

## 6.1 Disaster Recovery without meta-data

If the meta-data of the Disaster interface is not available then you have to search for the meta-data.

To get this meta-data or to restore directly a saveset from tape **SEPs** supplies the program "sm\_recover" (see 3.3.1.6).

The following output shows a sample of a `sm_recover` session:

```
florix:/opt/sesam/var/ini # sm_recover
num device      name      typ
  1 disk1       DISK_HARD
  2 /dev/nst0    TZ88
Enter drive number, (r) to repeat list, (q) to quit: 2
```

Analyse a media: restore data or listings of savesets

Restoring data while **SEPs** is active may cause conflicts  
due to concurrently running activities on the drive.

If you're shure, that there are no activities scheduled during  
recover, you don't need to block **SEPs**

Blocking **SEPs** during recover prevents execution of activities  
scheduled for the other drives too.

Do you want to block **SEPs** ? (y|n] > y

wait until **SEP**uler - the timecontrol of **SEPs** - finishes its current work ...  
**SEP**uler now is blocked ...

Do you wish to enter label, saveset-name and segment-number directly ( no search

## 6.1. DISASTER RECOVERY WITHOUT META-DATA

ing on media ) (y/n) > n

now tape will be rewinded and scanned until end ...

Header:

STATUS=SUCCESS

MSG="Tapelabel = WEEK00002,TapeID = 2.000000,Tapeinfo = SESAM-volume, BlockSize = 65536, Creation Date = 2004-02-19 12:27:57"

Segments:

```
1, SavesetName = SC20040219122608, SavesetInfo = job=SESAM_BACKUP,UNIX
2, SavesetName = SC20040219122622, SavesetInfo = job=ntpc23_all,UNIX
3, SavesetName = SC20040219122611, SavesetInfo = job=softnt15_all,WNT
4, MSG="1043: Invalid tape format. Saveset Header should follow TapeMark"
5, MSG="1043: Invalid tape format. Saveset Header should follow TapeMark"
6, SavesetName = SC20040219122611, SavesetInfo = job=softnt15_all,WNT
7, MSG="1027: Skipping tapemarks on tape failed."
```

Trailer:

STATUS=SUCCESS

Tape Label: WEEK00002

Next Tape Label:

Tape Id: 2.000000

Tape BlockSize: 65536

Tape Info:

Creation Date: 2004-02-20 10:00:19

Tape EOM Flag: FALSE

MSG="OK"

now media was scanned

there are 4 savesets on the media

I001-RECOVER General tape data

I002-RECOVER Label : WEEK00002

I003-RECOVER Creation date : 2004-02-19 12:27:57

I004-RECOVER Header info : SESAM-volume,

I005-RECOVER Blocksize : 65536

I006-RECOVER Info :

I007-RECOVER Last write : 2004-02-20 10:00:19

I008-RECOVER Split savesets: FALSE

I009-RECOVER Next label :

Listing of savsets

```
1 SC20040219122608 Task: job=SESAM_BACKUP; Source:
2 SC20040219122622 Task: job=ntpc23_all; Source:
3 SC20040219122611 Task: job=softnt15_all; Source:
4 SC20040219122611 Task: job=softnt15_all; Source:
```

```
Enter number of saveset or q(uit) for exit > 1

Do you want to copy files or create listing from saveset ? (c/l) > c

Enter target directory ( / means original place ) > /

Allow overwriting of equally named files at target (y/n) > y

Starting supervisor process SMS_WATCH in queue qu_tape_trans2
supervisor process SMS_WATCH now is started.

I011-RECOVER Restoring file-listing of saveset SC20040219122608 on media WEEK00002 (/)
I016-RECOVER Copied files of saveset SC20040219122608 on media WEEK00002 to /.

protocol in file /opt/sesam/var/prot/recover_20040311100209.prt

Listing of savsets
 1 SC20040219122608 Task: job=SESAM_BACKUP; Source:
 2 SC20040219122622 Task: job=ntpc23_all; Source:
 3 SC20040219122611 Task: job=softnt15_all; Source:
 4 SC20040219122611 Task: job=softnt15_all; Source:

Enter number of saveset or q(uit) for exit > q
```

## 6.2 Disaster Recovery under Windows

For Windows-Clients additionally the Backups of Registry resp. System State must be available. On WNT there is only the Registry as a system database, on Windows2000 the concept was extended, and in the so called **System State** is stored all system relevant data ( active directories, boot files, registry, etc. ).

In order to Backup the Registry resp. System State, in disaster Backup tasks must be specified as Backup source "registry" resp. "system.state" , e.g. **SESAM\_REG** and **SESAM\_SYSTEM\_STATE**.

These tasks should be executed regularly, together with the Backup of the directories, mentioned above.

### Hint

The disaster recovery was tested on the following Windows systems.

NT4.0 (SP3)Workstation

Windows 2000 (SP3)

Windows 2000 Server (SP3)

XP Professional

Windows 2003 Server (SP3)

### 6.2.1 Proceeding in disaster case

Installation of the operating system:

The installation directory must be the same as the previous one. Attention should be paid to the correct group assignment and network configuration!

The original Service Pack must be installed as well.

Installation of the SEPsesam Client

Proceed according to README\_INSTALL.txt (see 2.4).

During the installation should be specified the server, which had managed the disk and Registry Backup.

Restore of the Registry resp. the System State:

1. Boot the Windows 2000/2003/XP-Rechner in Recovery mode, therefore press the **F8**-key (*Not available on Windows NT*).  
(without Active Directories it should go also in normal mode)
2. Restore the **SESAM\_REG** saveset of the Registry-Backup with the help of metadata from the Disaster interface
3. Boot the computer in normal mode. Only in case of Windows 2000 Professional / Windows 2000 Server / 2003 Server / XP with active directory you should boot with the **F8**-key in directory recovery mode.
4. Restore the **SESAM\_SYSTEM\_STATE** saveset of the System State-Backup with the help of metadata from the Disaster interface
5. Restore the remaining savesets of the Disaster interface with mode **overwrite**

#### Hint

In case %SYSTEMROOT% is not equal to SESAMROOT (e.g. c:\WINNT and d:\Programme\SEPsesam) we have a restore problem. Therefore please change the file <SESAMROOT>\var\ini\sm.ini under [PATHES] the value of the variable gv\_rw\_tmp=c:\temp\.

To avoid that, you should install **SEPsesam** client preferably there, where your system resides.



# Chapter 7

## Client System Recovery

### 7.1 System Recovery for UNIX, LINUX Clients

In order to be ready for system disk failures at UNIX, LINUX Clients, the corresponding system directories must be Backed up.

In case of system disk failure, after a new disk is built in and the operating system is installed, this data is copied back again with a Restore.

Attention should be paid that a full Restore makes sense only in case that the hardware was not changed. Otherwise the corresponding device and/or driver files must be filtered out in a selective Restore or further processed after the full Restore.

### 7.2 System Recovery for Windows Clients

In order to be ready for system disk failures at Windows Clients, the corresponding system directories, Registry and System state (Win2000) must be Backed up.

In case of system disk failure, after a new disk is built in and the operating system is installed, this data is copied back again with a Restore.

1. Install the operating system at the Client
2. Install SEPsesam at the Client
3. Boot the Windows 2000/2003/XP-computer in Recovery mode, therefore press the **F8**-key  
(*Not available on Windows NT*).  
(*without Active Directories it should also go in normal mode*)  
The **SEPsesam** Server must be reachable with *ping* and resolvable by *nslookup*
4. Restore the Registry data over GUI with mode **overwrite**
5. Boot the computer in Normal mode. Only in case of Windows 2000 Professional / Windows 2000 Server / 2003 Server / XP with Active Directory you should boot with the **F8**-key in directory recovery mode.
6. Restore the System State data over GUI with mode **overwrite**

7. Restore the remaining necessary savesets of the Client ( Mode up to the wish of the user )

**Hint**

In case that %SYSTEMROOT% is not equal SESAMROOT (e.g. c:\WINNT and d:\Programme\SEPsesam) we have restore problems. Therefore please change the file <SESAMROOT>\var\ini\sm.ini under [PATHES] the value of the variable gv\_rw\_tmp=c:\temp\.

To avoid that, you should install the **SEPsesam** client preferably there, where your system resides.

# Chapter 8

## Special modules

Some optional modules will be described below. Further Backup modulee, e.g. ORACLE, INFORMIX, SAP/R3 are described in the corresponding documentation.

### 8.1 Online-Backup/Restore Domino-Server

#### 8.1.1 System requirements

##### Requirements at the Client

- Lotus Notes Domino Server 5.0.8
- Sesam NT Client (e.g. 1.5.1.14)

Additional modules (bin/sesam):

- sbcln.dll

sm.ini modification examples:

```
[SBC_DATABASE]
DB_CLIENTS=SBCLN:sbcln.dll
sbc loads then the DLL with Keyword SBCLN:databasename.
```

```
[SBC_NOTES]
tmp_dir=c:\lotus\domino\data\tmp
eventually create a Temp directory or set it to var/tmp from Sesam.
```

```
[SERVER]
```

```
sesam_server=SesamServerName
```

set.

Set the PATH Variable after \lotus\domino nnotes.dll (6.7 MB) should be reachable and/or \lotus\notes nnotes.dll (6.7 MB)

### 8.1.2 Full Backup

Principle:

```
sbc -b -S softnt17 -s notes.sset SBCLN:c:\lotus\domino\data\*.nfs
```

GUI

Backup type: Lotus Notes

#### Example for source

c:\lotus\domino\data\bookmark.nsf (or \*.nsf)

#### Attention

Keyword SBCLN: for Backup type Lotus Notes it is taken from the SEPsasam DB table task\_types and automatically inserted before the source specification.

### 8.1.3 Full Restore

Shut down the Domino Server

Principle:

```
sbc -r -S softnt17 -s notes.sset SBCLN:c:\lotus\domino\data\*.nfs
```

In the GUI over corresponding selection in the Restore wizard.

## 8.2 Online-Backup/Restore MS SQL Server

### 8.2.1 System requirements

#### Requirements at the Client

- MS SQL Server 7.0

### 8.2.2 Description MSQL

MS SQL 7.0 consists of several Windows NT services, the main service is however MSSQLServer. 2 further services are MSDTC and SQLServerAgent. The databases reside at a standard installation under mssql7\data as both data (.mdf) and log-file (.ldf).

The actual names for the Backup source (e.g. SBCMSQL:pubs) are selected with Enterprise

Manager.

With `sqlmangr{.exe}` (Enterprise Manager) allow system user for the corresponding tables (double click under location/sqlserver/database/users) so the Backup and Restore can be started in the background.

### 8.2.3 Full Backup

Principle:

```
sbc -b -S decunix:11001 -s sql.sset -d /tmp SBCMSQL:pubs
```

GUI:

Backup type: MS SQL Server

**Example for source**

pubs

#### **Attention**

Keyword SBCMSQL: for Backup type MS SQL Server it is taken from the SEPsesam DB table `task_types` and automatically inserted before the source specification.

### 8.2.4 Full Restore

Principle:

```
sbc -r -a r -S decunix:11001 -s sql.sset -d /tmp SBCMSQL:pubs
```

In the GUI over corresponding selection in the Restore wizard.

Finally go with `sqlmangr{.exe}` (Enterprise Manager) to the appropriate Location/Database and for Backup Restore Database select the corresponding ComboBox 'first backup to restore'.

## 8.3 Online-Backup Exchange-Server 5.5

### **Hint**

The connection to Exchange Server 2000 is described in a separate document.

### 8.3.1 System requirements

#### **Requirements at the Client**

- Exchange Server 5.5

- Sesam NT Client (e.g. 1.5.1.14)

Additional modules (bin/sesam):

- edbbcli.dll
- sbc\_msex{.exe}
- start\_service.bat (Attention for English/German Versions the service names can differ)
- stop\_service.bat

sm.ini modification examples:

```
[PATHES]
gv_rw_smxb_log=C:\sesam_client\nt_cli.1.5 .1 .14\var\log\smxb\ (The directory must be then
created)
gv_rw_work=C:\sesam_client\nt_cli.1.5.1.14 \var\work\ gv_rw_tmp=C:\sesam_client\nt_cli.1.5.1.14\var\tmp\
```

sm\_node Settings for Sub Module sm\_ctrlld\_main

under services

sm\_node

Start type

Login as service account e.g. NTTEST\Administrator Password (so the system user may administer Exchange)

### 8.3.2 Description EXCHANGE

MS Exchange 5.5 can be installed on NT Domain Servers only.

MS Exchange consists of several Windows NT services, which control the JetDB Databases.  
(Warning: for English/German Versions the service names can differ)

Service name (net start/stop) Description Database

MSEExchangeMTA message transfer agent mtadata\ ....

MSEExchangeES

MSEExchangeIS information store mdbdata\priv.edb

mdbdata\pub.edb

MSEExchangeDS directory service dsadata\ds.edb

### 8.3.3 Full Backup

As Backup-source the Exchange Server name should be selected. In the GUI then should be selected Exchange Backup, so that then sbc\_msex is called.

Principle:

```
sbc_msex -b -S decunix:11001 -s exchange.sset -j exchange -d /tmp QSWNT400
```

#### **Example with sm\_ctrlc**

```
sm_ctrlc -l system -p 11301 qswnt400 sbc_msex -b -C softnt10 -S softnt10 -l full -s SC20011022151425  
-d SMS:disk1 -t DISK00001:1 -j ex_IS -i 'ex_IS,qswnt400,sbc_msex,' qswnt400
```

#### **8.3.4 Information Store Backup**

As Backup source is selected the Exchange Server name and Submodule delimited with Slash.

#### **Example**

```
sbc_msex -b -S decunix:11001 -s exch_IS.sset -j exch_IS -d /tmp QSWNT400\IS
```

#### **8.3.5 Full Restore**

#### **Example**

```
sbc_msex -r -S decunix:11001 -s exchange.sset -j exchange -d /tmp QSWNT400
```

In the GUI over corresponding selection in the Restore wizard.



## Chapter 9

# Problem analysis and solution

The following description has the purpose, that errors can be recognized as soon and exactly as possible.

Here SEPsesam offers the following possibilities

- diverse Protocols (incl.Email-delivery)
- Daily protocol files translatable with a program from foreign languages in German to simplify the analysis.
- Logging-mechanism with setable levels

Especially in the scenario ”**SEPsesam** runs for weeks without a problem with high throughput” and ”suddenly” the throughput decreases or specific computers are no more backed up, **SEPsesam** serves in most cases as a detector for hardware- and/or software technical defects or changes in the network of the operator (Changed addresses, wrongly connected backbone, defective star connector etc).

For problems in the functional sequence of **SEPsesam**, the following analysis sequence can be recommended:

1. Check with **sm\_main status**, if all processes are running (see 3.5)  
if necessary start again the missing process with **sm\_main reload ...**
2. Daily protocol (see 4.2)
3. Specific protocols for Backups, Restores (see 4.3)
4. Logging-files (see 4.6)

### 9.1 Problems with the interface (GUI)

Problems with the Java-security settings are sometimes difficult to recognize, because e.g. the GUI-Client does not start, but the configuration error is to be searched on the GUI-Server.

Error description	Cause, Solution
GUI Server not reachable	* Network connection to <b>SEPs</b> broken => is the computer running ? * GUI-Server process is not running => sm_main reload rmi
Connection to database failed	DB- or RMI-Server are not running => sm_main reload db => sm_main reload rmi
GUI cannot start	Problem with Java-Rights entry for the computer in sm_java.policy missing: Example <pre>// NET permission java.net.SocketPermission "mycomputer:*", "connect,accept,resolve";</pre>
Problem upon writing/reading to the working directory:	Entry for the working directory in sm_java.policy missing Example Windows: <pre>// FILE permission java.io.FilePermission "D:\sesam\var\-", "read,write";</pre> Example Linux/Unix/Tru64 <pre>// FILE permission java.io.FilePermission "/sesam/var/-", "read,write";</pre>
No Online-guide appears	* No Adobe Acrobat Reader installed => free Download under <a href="http://www.adobe.de">www.adobe.de</a> * Reader not configured in the GUI => GUI:Configuration-pre-assignments???-Online
No Online-Help appears	* no Browser installed => please install * Browser not configured in the GUI => GUI:Configuration-pre-assignments???-Online

### Tips

- The access rights for missing computers can be entered in the server-side java-policy-file with the program **sm\_setup allow\_gui {rechner} {user}**.
- After changes in the sm\_java.policy the GUI-Server must be restarted with **sm\_main reload rmi**. A runtime change is not implemented in the concept of Java for security reasons.
- The syntax for pathnames in the sm\_java.policy is platform dependent.
- In order to test, if there are problems with the Java Security, the line *permission java.security.AllPermission;* can be un-commented. In this way the restriction to explicitly

specified rights is switched off.

To avoid security holes this line after the test should be commented out again!

## 9.2 Error messages of the kernel software

Network problems belong to the most often error causes, i.e. a computer does not run without problems and/or the hardware-technical connection to it is corrupt. Here the operator must take care, that the communication runs without problems (**Network Check (NW-Check)**).

### Network Check

With the help of standard communication programs the connections and the address resolution must be checked (ping, nslookup, address resolution etc.).

Additionally the connection must be checked with the corresponding SEPsasam access program (CTRL/SSH) (see 3.4).

The address resolution must be consistent, i.e. if for a TCP/IP name the resolution gives an IP-address, then the resolution for that IP-address must give the same TCP/IP name!

### Example

```
# nslookup decunix
Server:  seplinux2.sep.de
Address: 193.28.59.40

Name:    decunix.sep.de
Address: 193.28.59.94

# nslookup 193.28.59.94
Server:  seplinux2.sep.de
Address: 193.28.59.40

Name:    decunix.sep.de
Address: 193.28.59.94
```

In cases, where under 'Cause, Solution' only => **support@sep.de** appears, an analysis of the logging file is necessary, which must be sent for this purpose to the Support. **support@sep.de** tells you, which files are necessary.

### Hint

Under {*val*} appear in the messages the corresponding actual values.

### 9.2.1 BACKUP - problems at backups

Error message	Cause, Solution
E001-BACKUP Error during working on PRE interface of backup {val}: {val}	Bug in the PRE-Script  => user programmed Authorization not configured => (see 3.4) NW-Check
E002-BACKUP Cannot submit SMS.WATCH-process to queue {val}.	Queuemanager is not running  => sm_main stop — start
E003-BACKUP Could not read gv_bck_msg-{val}-{val} .	support@sep.de
E004-BACKUP {val} {val}	common error => support@sep.de
E005-BACKUP Error during working on POST interface of backup {val}: {val}	Bug in the POST-Script  => user programmed Authorization not configured => (see 3.4) => NW-Check
E006-BACKUP {val} error - please view backup protocol	Error during data transfer  => Backup protocol to support@sep.de
E007-BACKUP Invalid option {val} ( line {val} )	=> sm_backup -h  Follow the usage
E008-BACKUP SBC version at client side does not support encryption: {val}	old SBC-Version on the Client  => Contact support@sep.de, discuss and install the right version

## 9.2. ERROR MESSAGES OF THE KERNEL SOFTWARE

### 9.2.2 BASICS

Error message	Cause, Solution
E001-BASICS STR_CHAIN string overflow	=>support@sep.de
E002-BASICS {val} i error opening file {val} mode:{val}	insufficient disk space  => extend missing directory => Create directory =>support@sep.de
E003-BASICS {val} i {val} not yet existing - please restart SESAM.	sm_startup
E004-BASICS GET_LOCAL_TCPIP_ADRESS could not find a usable WinSock DLL.	=>support@sep.de
E005-BASICS HAL_REDIR string overflow: {val} {val}	=>support@sep.de
E006-BASICS CHECK_SMS autom. SMS restart failed - SMS not running.	=> sm_main stop — start; if necessary Reboot the computer
E007-BASICS {val} i error deleting file(s) {val}	=>support@sep.de
E008-BASICS Error in command execution {val}: {val}	NW-Problem  => NW-Check Authorization not configured => (see 3.4)
E009-BASICS Error copying file {val} {val}: {val}	Check if the file system is full; =>support@sep.de
E010-BASICS FILE copy {val} -i {val} could not open source for read	=>support@sep.de
E011-BASICS FILE copy {val} -i {val} could not open target to write	=>support@sep.de
E012-BASICS FILE copy {val} -i {val} copy invalid status {val}	=>support@sep.de
E014-BASICS Could not submit job {val} into queue {val}.	Queuemanager is not running  => sm_main stop — start
E013-BASICS Failure in input from - to: {val} - {val}	=> Usage
E015-BASICS Missing parameters - more information with	=> Usage

### 9.2.3 BREAK - unexpected break

Error message	Cause, Solution
E001-BREAK Couldn't block queue {val}.	Queuemanager is not running => sm_main stop —start =>support@sep.de
E002-BREAK Couldn't start queue {val}.	as E001-BREAK
E003-BREAK Aborting by {val} at {val} failed ({val})	=>support@sep.de
E005-BREAK Wrong input value: {val}	=> sm_break -h Usage
E004-BREAK Missing parameters - try sm_break -h	=> sm_break Usage

### 9.2.4 CONFDRI - Configuration drives

Error message	Cause, Solution
E001-CONFDRI Submit {val} into queue {val} failed.	Configuration drives  Queuemanager is not running => sm_main stop — start
E002-CONFDRI Error during activating the SesamMultiplexStream dataserver.	SMS-Server is not running  => sm_main reload sms
E003-CONFDRI Automatic hardware setup and configuration finished with failure. Please take a look into daily protocolerrors.	=> Configure loaders and drives through the GUI  =>support@sep.de

### 9.2.5 CONFLOA - Configuration Loader

Error message	Cause, Solution
E001-CONFLOA Could not find out the status of filling of loader.	newly installed loader  => Check the cables => sm_slu scan
E002-CONFLOA Could not find out the drives of loader {val}: {val}	newly installed loader  => Check the cables => sm_slu scan
E003-CONFLOA Could not find out the initial contents of loader: {val}	newly installed loader  => Check the cables => sm_slu scan

## 9.2. ERROR MESSAGES OF THE KERNEL SOFTWARE

### 9.2.6 DATABAS - Problems with the database

Error message	Cause, Solution
E001-DATABAS Failure during access to database: {val}	=>support@sep.de
E002-DATABAS DB_SEL_FIRST {val}: cannot allocate memory.	=>support@sep.de
E003-DATABAS DB_SEL_ALLOC {val}: the recordlist is empty, cannot allocate a new element.Element allokieren	=>support@sep.de
E004-DATABAS DB_SEL_ALLOC {val}: cannot allocate memory.	Check if the file system is full; =>support@sep.de
E005-DATABAS {val} could not find column {val} within record.	=>support@sep.de
E006-DATABAS {val}: empty recordlist, cannot catch requested data.	=>support@sep.de
E007-DATABAS Unexpected NULL value.	=>support@sep.de
E008-DATABAS CONVERT_DATE_TIME: wrong parameter {val}	=>support@sep.de
E009-DATABAS OA_MAKE_DB_REC_LIS {val}: {val}	=>support@sep.de
E010-DATABAS OA_MAKE_DB_REC_LIS {val}: too much columns ( max {val} )	=>support@sep.de
E011-DATABAS {val} {val}: cannot allocate memory ( {val} Bytes)	=>support@sep.de
E012-DATABAS {val} SQL pipe doesn't return the expected characters	=>support@sep.de
E013-DATABAS {val} {val}: error during opening a pipe.	=>support@sep.de
E014-DATABAS OA_DO_SQL {val}: error from SQLcommand: {val}	=>support@sep.de
E015-DATABAS OA_DO_SQL {val}: error from DAMISQL: {val}	=>support@sep.de
E016-DATABAS {val} PSQL doesn't create output.	=>support@sep.de
E017-DATABAS {val} {val}: too much columns.	=>support@sep.de
E018-DATABAS {val} with unexpected result: {val}.	=>support@sep.de

### 9.2.7 DBFPACK - Database-File-Packer

Error message	Cause, Solution
E001-DBFPACK Cannot find out file	falschen DBF-Namen angegeben => {ID}/var/db/schema/sesam/*.dbf
E002-DBFPACK Missing 3.parameter for option 'P' .	=> sm.dbf_pack -h Usage
E003-DBFPACK Missing parameters for option 'i' .	=> sm.dbf_pack -h Usage
E004-DBFPACK Missing parameters for the DBF analysis.	=> sm.dbf_pack -h Usage
E005-DBFPACK Cannot open file {val}{val} to read.	=> wrong DBF-name specified => {ID}/var/db/schema/sesam/*.dbf
E006-DBFPACK Cannot open file insert.tmp to write.	=> Check {ID}/var/work
E007-DBFPACK Record <{val}> has wrong length.	=>support@sep.de
E008-DBFPACK Cannot open file {val}{val} to insert new counter	=>support@sep.de

### 9.2.8 DRIVES - Problems with drives

Error message	Cause, Solution
E001-DRIVES Wrong media {val} during attempt to mount on drive {val}	=> Change the media with a loader or manually => Check the media label (Archive adjustment) or sm_drive info Drive Nummer
E002-DRIVES Could not read label from media in drive {val}.	SMS-Server is not running => sm_main stop — start Media is defective => replace
E003-DRIVES Drive {val} currently not online ( {val} )	as E001-DRIVES
E004-DRIVES gv_ro_sms not yet defined ( please check INI and restart )	=> sm_startup
E005-DRIVES SMS could not find label on media.	as E001-DRIVES
E006-DRIVES SMS in not allowed state.	=> sm_main stop — start
E007-DRIVES The pipes of SMS aren't running - please restart SMS.	sm_main reload sms
E008-DRIVES Error from login to SMS	sm_main reload sms
E009-DRIVES message: {val}	=>support@sep.de
E010-DRIVES Error from initialising the media in drive {val}: {val}.{val}.	as E001-DRIVES
Error message	Cause, Solution
E001-GETVOL Request for media {val} completed with error: {val}	as E001-DRIVES =>support@sep.de

### 9.2.9 HOTSTS - Problems with computers

Error message	Cause, Solution
E001-HOSTS Could not find computer {val} in database: {val}	=> configure again
E002-HOSTS RemoteCopy {val}: invalid mode:{val}	=>support@sep.de
E003-HOSTS RemoteCopy {val} {val} {val} -> {val}: error at {val}{val}	=>support@sep.de  => evtl. NW-Check
E004-HOSTS RemoteCopy {val} {val} {val} -> {val}: {val}	=>support@sep.de
E005-HOSTS RemoteCopy error reading from {val} ( num.{val}): {val}	=>support@sep.de  => evtl. NW-Check
E006-HOSTS RemoteCmd {val} > invalid accessmode - {val}	=> Change Client property Accessmode in the GUI
E007-HOSTS RemoteCmd {val} > error: {val}	=>support@sep.de => evtl. NW-Check
E008-HOSTS Configuration of a {val} backup client completed with errors ({val}).	=>support@sep.de  => evtl. NW-Check => then repeat
E009-HOSTS WNT-computer {val} was NOT configured !!	=> NW-Check  => repeat
E010-HOSTS Error: cannot open local file {val} to insert SESAM server computer.	=> Check existence

### 9.2.10 LOADERS - Problems with loaders

Error message	Cause, Solution
E001-LOADERS Action {val} of loader {val} failed	=> Problems at the loader  => Check cables => sm_slu scan = Check SCSI-access => evtl. switch off for a short time
E003-LOADERS The specified destination slot {val} of loader {val} is occupied	Unload to already occupied Slot  => Check and fix if necessary the slotinfo in the archive => Archive adjustment in case of manual changes in the loader
E004-LOADERS Attention: Loader {val} is auto unloading! Auto unload will now be activated!aktiviert!	no action necessary
E005-LOADERS Attention: Intern drive number of drive {val} ({val}) not found in loader {val}! Please check your drive configuration.{val}	=> Check and fix if necessary the loader configuration

### 9.2.11 MEDIA - Problems with media

Error message	Cause, Solution
E001-MEDIA {val} error: {val}	=>support@sep.de
E002-MEDIA Error from submitting {val} into queue {val}	Queuemanager is not running  => sm_main stop —start
E003-MEDIA Error when loading media from slot {val}.	Error from EXXX-LOADERS
E004-MEDIA Administration of media-archive doesn't return a status.	=>support@sep.de
E005-MEDIA Archive action {val} finished with error: {val}	=>support@sep.de
E006-MEDIA Archive action {val} finished with error - unknown EXIT code: {val}{val}	=>support@sep.de

### 9.2.12 RESTORE - Restore problems

Error message	Cause, Solution
E001-RESTORE LIS_DB > {val}	=>support@sep.de
E002-RESTORE Restore task {val} not yet defined - please do it now	=>support@sep.de
E003-RESTORE Restore {val} completed with errors: {val}	=>support@sep.de
E004-RESTORE Selektive generations restore didn't find savesets.	=>support@sep.de
E005-RESTORE Selective generations restore cannot allocate memory ( {val} ).nicht belegen ({val}).	=>support@sep.de
E006-RESTORE SEARCH.LIS {val} is an invalid name of task.	=>support@sep.de

### 9.2.13 SBC\_COM - Messages of the Sesam Backup Client

Error message	Cause, Solution
E000-SBC_COM Wrong parameter	=> Usage sm_sbc_com -h
E001-SBC_COM Wrong number of parameters	=> Usage sm_sbc_com -h
E002-SBC_COM Missing or wrong mandatory task	=> Task name <b>must</b> be specified
E003-SBC_COM Failure selecting from database table	=>support@sep.de
E004-SBC_COM Missing mandatory label, media pool or drive number	=> Correct the mandatory input
E005-SBC_COM FIND_DRIVES_OF_POOL no drives for pool {val} configuredkonfiguriert	=> Complete the media pool in the GUI
E006-SBC_COM A session {val} was not connected before	=> first open external session
E007-SBC_COM Missing mandatory save set identifier	=> Correct the mandatory input
E008-SBC_COM GET_SEGM_AND_OFFSETS could not find selected file {val} in save set {val}Saveset {val} nicht finden	=> Correct the filename
E009-SBC_COM GET_SEGM_AND_OFFSETS wrong format in line [{val}]	=>support@sep.de
E011-SBC_COM Wrong parameter -s {val}: we need savesetname@starting-time as returned from Open Restorewie von OpenRestore zurückgegeben benutzen	=> Use savesetname@starting-time as returned from OpenRestore
E013-SBC_COM Restore not possible, bcs. backup {val} was not successfulwar	Use evtl.other Saveset of the same task
E014-SBC_COM INQUIRE_INFO wrong type	=> Usage sm_sbc_com -h
E015-SBC_COM INQUIRE_INFO save set {val} doesn't exist	=> Use evtl.other Saveset of the same task
E016-SBC_COM INQUIRE_INFO cannot open listing file {val} of save set {val} to read	Check syntax for errors
E017-SBC_COM During submit sm_sbc_com_ext	=>support@sep.de
E018-SBC_COM Failure updating database table	=>support@sep.de
E019-SBC_COM CONNECT_BACKUP loading media {val} into drive {val} failed{val}	Error from Exxx-LOADERS
E020-SBC_COM LOTUS_SAVESET there's no save set containing file {val}	Use evtl.other Saveset
E021-SBC_COM Failure in file copy {val} {val}	=>support@sep.de
E022-SBC_COM Medium {val} currently is not available.	is used somewhere  => wait until free => terminate the other action

### 9.2.14 SEPULER - Messages of the SEP\_sesam Scheduler

Error message	Cause, Solution
E001-SEPULER Error from initialization of queue {val} (type {val}).	=> Queuemanager is not running => sm_main stop —start
E002-SEPULER Error from submitting backup {val} into queue {val} (type {val}).	=> as E001-SEPULER Error from initialization of queue {val} (type {val}).
E003-SEPULER Duplication of primary key in DB:results.	=>support@sep.de
E005-SEPULER invalid command: {val}	=>support@sep.de
E006-SEPULER Restoretask {val} not yet defined - please do it now.nachholen	=> repeat in the Restore wizard
E007-SEPULER READ_INI sent error {val}.”	=>support@sep.de
E008-SEPULER There are no drives attached to drive group {val}.	=> select other group or drive  => Change the configuration
E009-SEPULER String overflow: {val} -> {val}	=>support@sep.de
E010-SEPULER Wrong type of schedule cycle: {val}	=> select another type
E011-SEPULER Error happend during calculation of user defined list for schedule {val}.	=>support@sep.de
E012-SEPULER Calculating next execution for schedule {val} returns always the same time{val}	=>support@sep.de

### 9.2.15 OTHERS

Error message	Cause, Solution
E001-START Drive is not available ({val})	=> Correct the configuration
E002-START Drive {val} does not exist ({val})	=> Correct the configuration
Error message	Cause, Solution
E001-STARTUP Directory {val} not found!	=> Problem after Installation => Manually create the directory
Error message	Cause, Solution
E001-WATCH Received performance data with invalid format: {val}	SMS-Server is not running  => sm_main reload sms This message may appear temporarily!
E002-WATCH EOM finished with error: {val}	=>support@sep.de

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