



Fujitsu Siemens Computers

S E S A M / S Q L - S e r v e r Enterprise Edition V3.2A
S E S A M / S Q L - S e r v e r Standard Edition V3.2A
S E S A M / S Q L - D C N V3.2A
S E S A M / S Q L - L I N K V3.2A

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R E L E A S E N O T I C E

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RELEASE NOTICE SESAM/SQL-Server / -DCN / -LINK V3.2A

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1 General

This release notice is a summary of the major extensions, requirements and operating information with regard to:

SESAM/SQL-Server Enterprise Edition	(BS2000/OSD) V3.2
SESAM/SQL-Server Standard Edition	(BS2000/OSD) V3.2
SESAM/SQL-DCN	(BS2000/OSD) V3.2
SESAM/SQL-LINK	(BS2000/OSD) V3.2

SESAM/SQL-Server is a relational database system for the BS2000/OSD (*) operating system.
SESAM/SQL-Server V3.2 is the follow-up version to SESAM/SQL-Server V3.1B(*).

The new SESAM/SQL-Server V3.2 contains developments for the SQL functionality as well as for the utility programs and high availability.

SESAM/SQL-Server V3.2 is available in two variants:

1. SESAM/SQL-Server Enterprise Edition (SES/SQL-EE)
This variant contains a database handler (DBH) with multitasking capability that can handle up to 16 DBH tasks.
2. SESAM/SQL-Server Standard Edition (SES/SQL-SE)
This variant is a single task DBH system for those customers that do not require a DBH with multitasking capability

The term SESAM/SQL-Server is used in the following text where it does not matter which variant is in use.
SESAM/SQL designates the product family, including SESAM/SQL-DCN and SESAM/SQL-LINK.

SESAM/SQL-DCN is an add-on product to the SESAM/SQL-Server database system and provides distributed database processing.
SESAM/SQL-LINK is an additional add-on product for /390 hardware and SR2000.
It can be used if databases are only to be processed by one program. The database handler can be linked into the program concerned.

The contents of the release notice has been modified with respect to the release level.
It corresponds to correction level V3.2A73 of December 2006.

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(*) SESAM (R) and BS2000/OSD (R) are trademarks of
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The use of names, trademarks, etc. in this release notice does not entitle readers to assume that these names/designations may be used without restriction by anyone; often the names/designations are protected by law or contract, even if this is not indicated here.

Modifications to the release notice since the release of SESAM/SQL-Server V3.2A are marked in the right margin as follows:

Change level	Margin marking	
V3.2A10	*1	*1
V3.2A20	*2	*2
V3.2A30	*3	*3
V3.2A40	*4	*4
V3.2A73	*5	*5

This release notice is supplied as a file in uppercase and lowercase. Customers will receive an updated version of this file should any subsequent changes be made. To print this file, use

```
/PRINT-DOCUMENT FROM-FILE=SYSFGM.SESAM-SQL.032.E, -  
/ DOC-FORM=*TEXT(LINE-SPACING=BY-EBCDIC-CONTR) (English)  
/PRINT-DOCUMENT FROM-FILE=SYSFGM.SESAM-SQL.032.D, -  
/ DOC-FORM=*TEXT(LINE-SPACING=BY-EBCDIC-CONTR) (German)
```

All BS2000 product release notices are available in the Internet. This one is available under the following URL:

<http://manuals.fujitsu-siemens.com>

If one or more previous versions are skipped when this version is used, the information from the release notices (and README files) of the previous versions must be noted.

1.1 Ordering

SESAM/SQL-Server V3.2, SESAM/SQL-LINK V3.2 and SESAM/SQL-DCN V3.2 can be ordered from your local distributors.

For technical reasons, there are special SESAM/SQL-Server and SESAM/SQL-DCN order units for SPARC64 hardware. SESAM/SQL-Link is not available for SPARC64 hardware.

These products are subject to the general terms and conditions of the software product use and service agreement.

1.2 Delivery

The SESAM/SQL-Server V3.2, SESAM/SQL-LINK V3.2 and SESAM/SQL-DCN V3.2 files are supplied via SOLIS.

The current file and volume characteristics are listed in the SOLIS2 delivery cover letter.

The following table shows the release units that are supplied with the different delivery units. The name of each delivery unit is shown in parentheses. The subscript [-SX] indicates that the name of the delivery unit for SPARC64 hardware is derived from the name of the delivery unit for /390 hardware and SR2000 by adding "-SX".

Product (delivery unit)	Release Unit
SESAM/SQL-Server V3.2 Enterprise Edition (SES/SQL-EE[-SX])	SES-SQL-EE SES-SQL-SE SESAM-SQL (SESDBA V3.1) * (ODBC-DEMO-SES V3.7) **
SESAM/SQL-Server V3.2 Standard Edition (SES/SQL-SE[-SX])	SES-SQL-SE SESAM-SQL (SESDBA V3.1) * (ODBC-DEMO-SES V3.7) **
SESAM/SQL-LINK V3.2 Linked-in Variant (SES/SQL-LK)	SES-SQL-LK
SESAM/SQL-DCN V3.2 Supplementary product for distribution (SES/SQL-DCN[-SX])	SES-SQL-DCN

(*) The release unit SESDBA comprises the server and client software for the JDBC interface to SESAM/SQL. Please note the separate release notice for this release unit.

(**) The release unit ODBC-DEMO-SES is not a component of SESAM/SQL, but rather comprises a demo version of the ODBC driver ODBC ROCKET from gfs (client and server parts). This allows transparent access to data in SESAM/SQL databases from a PC via the ODBC interface. Please refer to the ODBC-DEMO-SES release notice and the gfs web site under <http://www.odbc-rocket.de> for further information.

One of the delivery units SES/SQL-SE or SES/SQL-EE is additionally required for using the delivery units SES/SQL-LK and SES/SQL-DCN.

The delivery comprises the files shown in the table below, grouped according to whether, regardless of the HSI, they are only required on SPARC64 hardware or only on other systems (/390 hardware and SR2000).

Release Unit SES-SQL-EE (Enterprise Edition):

The following delivery component is only required on /390 hardware and SR2000 (delivery group SES-SQL-EE-NSX):

SYSLNK.SES-SQL-EE.032 SESAM module library containing the modules that are only required for the independent DBH in the Enterprise Edition

The following delivery component is only required on SPARC64 hardware (SX product line) (delivery unit SES-SQL-EE-SX):

SPULNK.SES-SQL-EE.032 see SYSLNK.SES-SQL-EE.032

Release Unit SES-SQL-SE (Standard Edition):

The following delivery component is only required on /390 hardware and SR2000 (delivery group SES-SQL-SE-NSX):

SYSLNK.SES-SQL-SE.032 SESAM module library containing the modules that are required for the independent DBH in the Standard Edition

The following delivery component is only required on SPARC64 hardware (SX product line) (delivery unit SES-SQL-SE-SX):

SPULNK.SES-SQL-SE.032 see SYSLNK.SES-SQL-SE.032

Release Unit SES-SQL-LK (linked-in variant):

This release unit is only available on /390 hardware and SR2000. It forms delivery group SES-SQL-LK.

The following delivery component is only required on /390 hardware:

SYSLNK.SES-SQL-LK.032 SESAM module library containing the modules that are only required for the linked-in DBH

The following delivery component is only required on SR2000:

SRULNK.SES-SQL-LK.032 see SYSLNK.SES-SQL-LK.032

Release Unit SES-SQL-DCN (add-on product for distribution):

The following delivery components are only required on /390 hardware and SR2000 (delivery group SES-SQL-DCN-NSX):

SYSLNK.SES-SQL-DCN.032 SESAM module library containing the modules that are only required for SESAM/SQL-DCN

SYSSSC.SES-SQL-DCN.032.KOMMD Declaration for the SESAM/SQL-DCN subsystem in class 3/4 memory for communication with distribution

The following delivery component is only required on SPARC64 hardware (SX product line) (delivery unit SES-SQL-DCN-SX):

SPULNK.SES-SQL-DCN.032 see SYSLNK.SES-SQL-DCN.032

SPUSSC.SES-SQL-DCN.032.KOMMD Declaration for the SESAM/SQL-DCN subsystem in class 3/4 memory for communication with distribution

Release Unit SESAM-SQL:

contains the delivery components that are additionally delivered with both SES/SQL-EE and SES/SQL-SE product variants

The following delivery components are required regardless of the HSI (delivery group SESAM-SQL):

SINLIB.SESAM-SQL.032.SNMP-SA SNMP subagent library for SESMON data

SIPLIB.SESAM-SQL.032.CLI Call Level Interface for applications with BLOBs or count field in dynamic SQL

SIPLIB.SESAM-SQL.032.MACUTM UTM macro library for SESAM/SQL-Server

SIPLIB.SESAM-SQL.032.MACUTM.1 UTM macro library for larger process memory (see section 3.4.4)

SIPLIB.SESAM-SQL.032.SPEZ Library of special elements, as follows

- i) Procedures for optional Reps for SESAM
PRC.LMS.032.<rep>
(see section 2.7)
- ii) STATUSGB.ASS Assembler sources for generating special language modules to output CALL-DML status messages when using SEDI61(L) and SEDI63(L)

	iii) SESFS32.ASS	Conversion table for the SECSORT sort order
	iv) SEZTXT.ASS	Assembler sources with the texts of the job variables used by SESAM
	SYSFHS.SESAM-SQL.032.MON.E	Mask module for the SESAM Monitor (English; there is no German version)
	SYSFHS.SESAM-SQL.032.UTI.D	Mask module for the Utility Monitor (German)
	SYSFHS.SESAM-SQL.032.UTI.E	Mask module for the Utility Monitor (English)
	SYSMAN.SESAM-SQL.032.UTI.D	Help texts for the Utility Monitor (German)
	SYSMAN.SESAM-SQL.032.UTI.E	Help texts for the Utility Monitor (English)
	SYSMES.SESAM-SQL.032	Message file
	SYSSDF.SESAM-SQL.032	SDF subsystem syntax file
	SYSSDF.SESAM-SQL.032.USER	SDF user syntax file
	SYSDAT.SESAM-SQL.032.SP.D	Memory requirement information and performance data (German)
	SYSDAT.SESAM-SQL.032.SP.E	ditto in English
	SYSSPR.SESAM-SQL.032.RUN-STA	Procedure that implements the start commands of SESAM/SQL.
	SYSSPR.SESAM-SQL.032.RUN-CFG	Procedure that implements the CONNECT-SESAM-CONFIGURATION command for assigning the global configuration file
	SYSSPR.SESAM-SQL.032.RUN-MON	Procedure that starts SESAM Monitor to output information for the SNMP subagent of SESAM.
	SIPANY.SESAM-SQL.032.MAN-DB	Library containing the examples database, including the manual examples and a complete BLOB application
	SIPANY.SESAM-SQL.032.TOOLS	Documentation library of the included tools (SESDIAG, SEMSTAT, DSQL); procedures, sources, modules for compressed output of CATALOG information (INFOTAB); example procedures (SESDBB...)

SYSFGM.SESAM-SQL.032.D	release notice (German)	
SYSFGM.SESAM-SQL.032.E	release notice (English)	
SYSRME.SESAM-SQL.032.D	Readme file (German)	*3
SYSRME.SESAM-SQL.032.E	Readme file (English)	*3

The following delivery components are only required on /390 hardware and on SR2000 (delivery group %SESAM-SQL-NSX):

SYSLNK.SESAM-SQL.032	Library containing the modules required for all product variants
SYSSSC.SESAM-SQL.032.DBH	Declaration for SESDBH subsystem
SYSSSC.SESAM-SQL.032.KOM	Declaration for SESKOM subsystem (main module for all tasks)
SYSSSC.SESAM-SQL.032.KOMOD	Declaration for SESKOMOD subsystem for communication without distribution
SYSSSC.SESAM-SQL.032.SQLRT	Declaration for SESSQLRT subsystem for SQL runtime system

The following delivery components are only required on SPARC64 hardware (delivery group %SESAM-SQL-SX):

SPULNK.SESAM-SQL.032	SESAM library containing the modules in SPARC code that are required for all product variants
SPUSSC.SESAM-SQL.032.DBH	Declaration for SESDBH subsystem
SPUSSC.SESAM-SQL.032.KOM	Declaration for SESKOM subsystem (main module for all tasks)
SPUSSC.SESAM-SQL.032.KOMOD	Declaration for SESKOMOD subsystem for communication without distribution
SPUSSC.SESAM-SQL.032.SQLRT	Declaration for SESSQLRT subsystem for SQL runtime system

The SESAM-SQL release unit includes a CD-ROM with the following contents:

- DBAccess client software and documentation (JDBC interface)
- Demo version of ODBC-Rocket from gfs with client and server software
- Product information (e.g. brief information on SESAM/SQL V3.2, release notices of earlier versions, Excel chart for calculating the DBH address space requirements,....)

1.3 Documentation

The documentation is available as online-manuals under the following Internet address:

<http://manuals.fujitsu-siemens.com>

and can be ordered in paper form for an extra fee through the manual shop in the Internet:

<http://FSC-manualshop.com>

The following documentation is available for SESAM/SQL V3.2:

List of publications in English:

Manual	Order number
SESAM/SQL-Server V3.2A (BS2000/OSD) Core Manual	U22419-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) Database Operation	U22418-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) SQL Reference Manual Part 1 SQL Statements	U22420-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) SQL Reference Manual Part 2 Utilities	U22422-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) Utility Monitor	U22147-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) Messages	U22423-J-Z125-6-76
SESAM/SQL-Server V3.2A (BS2000/OSD) Performance Manual	U23535-J-Z125-5-76
SESAM/SQL-Server V3.2A (BS2000/OSD) Glossary and Master Index	U41055-J-Z125-3-76

The following manual is still valid:

Manual	Order number	Published
SESAM/SQL-Server V3.0A CALL-DML Applications	U1054-J-Z125-11	11/1999

2 Software extensions

The release of SESAM/SQL V3.1 implemented, in particular, functional extensions resulting from the SQL ISO 9075:1999 standard and were also required to further increase the high availability and improve administration in 24 hour operation.

This path is continued in V3.2. Developments, many of which were requested by the market via change requests, have been made in the areas of SQL functionality, utility programs and high availability.

The main innovations with regard to the previous version 3.1B are summarized in the following sections. You will also find a tabular overview in the introductions of the newly published manuals. This lists the manual and chapter in which each change is described.

2.1 SQL extensions

2.1.1 Enhanced block mode for SQL-INSERT

During a bulk insert, the data records are written in blocks, thus reducing the communications steps between the user program and database handler. Block reads were also possible in earlier versions of SESAM/SQL.

2.1.2 RETURN INTO with dynamic SQL

With dynamic SQL, the Return-Into clause of static SQL can be emulated with the CLI function `SQL_DIAG_SEQ_GET` for the count field automatically maintained by SESAM/SQL. This simplifies using the count field for programmers.

2.1.3 Lexicographic line compare

Multi-column lines used as operands in compare predicates make it simpler for programmers to formulate compare expressions and also make lexicographic comparisons possible. The latter can be processed extremely quickly by the database handler, particularly when comparing to column values with a secondary index.

2.1.4 Hit limiting with SELECT

A new pragma allows the ABORT-EXECUTION value, that is defined via a start parameter or administration command, to be modified separately for each SELECT statement. This allows a restrictive abort criterion to be applied to single jobs.

Since SESAM/SQL V3.1, the RECOVER TO function is also supported for catalog space. The entire catalog can be reset with RECOVER CATALOG ... TO and just the catalog space with RECOVER CATALOG_SPACE ... TO. This function has been extended such that the reset can also be made to catalog backups from an earlier version. All backups as of SESAM/SQL V2.0 are permitted. Refer to section 3.4.1.2 for the necessary procedure..

2.2.5 DB backup and concurrent copy with HSMS

The HSMS concurrent copy function is used internally for SESAM online backup with HSMS. The PBI file that was required for this earlier is therefore no longer needed and the backup and restore times are also considerably shorter.

The BCV mirror can be saved into an HSMS archive with just one SESAM COPY statement by using the HSMS function "concurrent copy with Symmetrix TimeFinder" internally. The user does not have to be concerned with either the splitting off nor the synchronization of the additional mirror units.

2.2.6 LOAD ONLINE

The new LOAD variant LOAD ONLINE is used for loading the data online, i.e. other applications can make read and write accesses to the table space concerned and the associated index spaces. Logging is also not interrupted. The database availability is therefore not restricted by loading data. With small load files, LOAD ONLINE is also appreciably faster in some cases than the previous LOAD.

2.2.7 Differentiated reaction with CHECK FORMAL

CHECK FORMAL can now differentiate between structure errors and other problems as well as between defective tables and defective indexes. If necessary, a large database can in this way be saved or made processable appreciably faster. The defective indexes can then be repaired separately.

2.2.8 Improved process control with REORG

The administrator can use the enhanced REORG statement to explicitly define the procedure to be used with the work file and any storage space that is freed up.

2.2.9 Unload optimization

The space required by the output file is minimized by means of requirement-oriented formatting. The UNLOAD statement runtime may also decrease since less blocks have to be written. If the output file already exists, this output file is used independent of its size. This is a modification compared to the description in the manual "SQL Reference Manual Part2".

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2.2.10 Using the DMS co-ownership

If the product SECOS is installed, database files can very simply be created in an ID other than the DBH ID by declaring the DBH ID as a co-owner for the file concerned in the ID to be used.

2.2.11 Utility Monitor

The Utility Monitor configuration file can be displayed in the Utility Monitor by simply pressing the F6 key. This also allows user-specific comments (see section 2.4.2) to be displayed during operation.

The Utility Monitor SESUTI is now monitored via a new temporary job variable #SESAM.SESUTI.JV, in addition to the previous SESAM.SESUTI.JV. The contents of these two job variables are the same. The additional temporary job variable allows several Utility Monitors running concurrently in the same ID to be monitored.

2.3 Administration

2.3.1 WebTA solution for graphical user interfaces

A WebTransactions solution has been developed for the PC user interfaces of the Utility Monitor, SESAM Monitor and SESADM applications for SESAM/SQL V3.2 that completely replaces the previous graphical user interfaces of these programs with access from a client PC. It is now possible to work with SESAM application programs via a browser over the Internet or Intranet using WebTransactions (WebTA). WebTA does not need any special emulation software on the PC side, just a browser, thus reducing dependence of the Windows version on the client PC.

2.3.2 New SNMP subagent for data of the Performance Monitor SESMON

The new subagent is part of SESAM/SQL-Server and provides the exact information that the Performance Monitor SESMON collates for file output. This allows important resources of a SESAM configuration to be monitored via SNMP (Simple Network Management Protocol). The subagent therefore differs considerably from the previous subagent for SESAM databases that support RDBMS MIB (RDBMS = Relational Database Management System, MIB = Management Information Base) according to RFC 1697. The previous subagent is still supplied with the product SSC-BS2.

Supplied with the new SNMP subagent is also a graphic tool as an example for a simple management platform. This graphics tool allows to display the information of the subagent in line graphs and bar charts. *1
*1
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Documentation for the new SNMP subagent and the graphic tool *1
is available in the 'snmp' directory of the included CD-ROM. *1

2.3.3 SAT support

The DBH supplied the Security Audit Trail (SAT) of SECOS with the data of security-related events. This increases security for the user and simplifies revision.

2.3.4 Improved SQL output with SESCOSP

If the CO-LOG file is created with the LONG protocol form, the SQL "In descriptors" (wildcard) and "Output" (result column) areas are output in printable format instead of a dump format. The conversion is similar to the structure of dynamic SQL descriptor area.

2.4 Sundry

2.4.1 FITC >32KB

The extension of the FITC allows messages up to 64 KB at the SQL interface. This considerably increases the performance in local block mode.

However, with communication over different versions, the message length is still 32 KB as in previous versions.

2.4.2 Comments in configuration files

Comments are allowed in configuration files with SESAM/SQL V3.2. This applies for the configuration files of the Database Handler, the Utility Monitor, the application programs and SESAM/SQL-DCN.

2.5 Performance

Basic performance parameters (including those for the multi-processor factor of the Enterprise Edition) are summarized in the file

SYSDAT.SESAM-SQL.032.SP.E

2.6 Implemented Change Requests (CR)

The following change requests have been implemented in this version:

CR No.	Contents
A0458008	Differentiated reaction of CHECK FORMAL
A0461669	Hit limiting with SELECT
A0461670	Enhanced block mode with INSERT
A0461673	RECOVER/REFRESH optimization
A0461674	LOAD optimization with loading and index maintenance
A0461675	UNLOAD optimization
A0461677	Completed TimeFinder support
A0461678	Using DMS co-ownership
A0461684	Shortened backup/recovery times
A0461712	Process control with REORG
A0472126	Reset to mark with external copy
A0480259	RECOVER TO a backup from V2.2
A0490024	RECOVER ADJUST rounding
A0490598	UTM-DB-DIAG area with SQL programs
A0491655	MONJV supply for HIPLEX-AF monitoring
A0491659	Guaranteed messages at program termination
A0524671	double the RTS process memory

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2.7 Optional Reps

The optional Reps described here are contained in the library SIPLIB.SESAM-SQL.032.SPEZ as J elements with the name PRC.LMS.032.<rep>.

The Rep procedures also always contain the 'UNREP functionality', i.e. the optionally activated Rep can also be cancelled. Details are given in the inline description of the separate Reps.

If an optional Rep is required, a target library is requested when the relevant Rep procedure is called. The user should note that the Rep must be incorporated into the version-specific library SYSLNK.SESAM-SQL.032 or SPULNK.SESAM-SQL.032 and into any additionally used library.

2.7.1 Rep: OPT.CATCACHE

This Rep can be used to modify the size of the catalog cache.

Where: C is the value of the DBH load option COLUMNS,
P is the value of the DBH load option PLANS,
F is a specific factor which has a default value of 2 and can be modified with this optional LMS Rep procedure.

The catalog cache also provides space for the metadata of exactly F*C*P columns. If F has the value 0, the catalog cache is disabled.

2.7.2 Rep: OPT.COSSQLLN

This Rep modifies the maximum length of SQL string output in job logging.

The purpose of this Rep is to decrease the high length value to speed up writing the SQL string to the CO-LOG. A smaller value decreases the SQL string output, thus reducing I/O operations.

2.7.3 Rep: OPT.DCN-ZEIT

Sending messages with DCAM may fail due to lack of memory. Two further tries are then made with a 100 msec delay between each try. If all tries fail, transmission is deemed to have failed.

This optional LMS Rep procedure can be used to set the number of transmission tries for DCAM operation and the waiting period between transmission tries. When choosing the values, note that higher values for transmission tries and pauses adversely affect the performance of the DBH. Values outside the range specified below can lead to malfunctions in the DBH.

The defaults are as follows:

Default value for number of transmission tries: 3
(change possible between X'0001' and X'7FFF')

Default value for pause
between two transmission tries : 100 msec
(change possible between X'0032' and X'03E8')

2.7.4 Rep: OPT.DOPPELDUMP

If a consistency check occurs several times consecutively, the diagnostic documentation is generally only created for the first occurrence. The documentation can be forced for each occurrence with this Rep.

Please only use this Rep after consulting your software service.

2.7.5 Rep: OPT.DRIVE60

This Rep causes DRIVE-TIAM applications in old style SESAM/SQL operation to be handled by SESAM/SQL as TIAM applications and not as DCAM applications.

Starting multiple examples of such DRIVE-TIAM applications can thus no longer lead to status 2B/AG.

If several concurrently running DRIVE applications have the same user name in "PAR USER=" when DRIVE is started, they are rejected with status 2U/DR.

The name specified in "PAR USER=" is only taken over into the SESAM userid as the application name if this Rep is enabled.

2.7.6 Rep: OPT.ESCALATION-MESSAGE

This Rep causes a system message SES3207 or SES3208 to be output if a transaction lock of a record or index value to a table or index escalates.

Parameter "ESCALATION-MESSAGE=*UNCHANGED" causes the setting of the Rep to remain unchanged.

Parameter "ESCALATION-MESSAGE=FALSE" disables output of message MSG7.

Parameter "ESCALATION-MESSAGE=TRUE" enables output of message MSG7.

Since the frequency of an escalation during a SESAM session cannot be predicted, Using this Rep can cause a large number of SES3207 and SES3208 messages

Please make sure you only use this Rep after consulting your software service!

2.7.7 Rep: OPT.JOPTGRENZE

This optional LMS Rep procedure can be used to modify the algorithm for optimizing the CALL-DML join processing.

This limit defines the gap between 'nested loop' and 'merge' join. The limit can also be reduced by the SI length of the join attribute, since this length defines the size of the join record in the join values CD.

The default for this limit is:

Default value of limit used: 16 (X'00000010')
(change possible between X'00000001' and X'00007FFF')

2.7.8 Rep: OPT.LOCK-V1

This Rep sets the lock behavior to match the behavior in SESAM/SQL V1.*.

2.7.9 Rep: OPT.NORTSTRACE

In SESAM/SQL V3.0A, a small trace buffer was set up in SQL-RTS to aid error diagnosis. Approximately 400 bytes are needed in the UTM process memory for this trace buffer.

This will have no effect on most applications. However, if an application (in a version < SESAM/SQL V3.0) used the UTM process memory up to the last 400 bytes, an out of memory condition may occur. In this case, the trace can be disabled with this Rep.

2.7.10 Rep: OPT.RPTC

This Rep prevents an INTR RESET, which refers to a transaction that is in the state "external PTC" for SESDCN being rejected

with message SEN2012; it is executed instead.

2.7.11 Rep: OPT.SCVINAKT

This Rep influences the release of resources from a user to the system memory management.

Resources are released if a statement ends with CLOSE SCAN or CLOSE CURSOR. They are initially administered in a user-specific chain and may be reused by this. If the chain contains more than "n" scans and their resources, they are returned to the system management. The limit "n" can be set with this Rep. If "n" is set high, the resource requirement (memory in this case) is higher. If "n" is set low, the path length of a statement is higher and, with high parallelism, serializing conflicts may occur in the memory management.

2.7.12 Rep: OPT.SIGNCODE-F

By default, x'C' is the code for a positive sign in COBOL output variables of data types NUMERIC and DECIMAL.

In some previous versions, x'F' was used for a positive sign. This optional LMS Rep procedure can be used to restore the old behavior of SQL programs.

If it is used on the module library from which SQL programs reload SESAM/SQL modules, type NUMERIC and DECIMAL output variables in these SQL programs are assigned the old prefix code x'F' for positive values.

2.7.13 Rep: OPT.SONDEROPEN

As of V3.0, certain special open IDs are no longer supported. This optional Rep re-enables the use of special open IDs.

2.7.14 Rep: OPT.STATUS97

The query range length field check can be disabled with this optional LMS Rep procedure.

2.7.15 Rep: OPT.SYSDUMP

If a DBH task is terminated with any P error, this Rep can be used to generate a system dump instead of a user dump for better diagnosis. System dump generation is enabled with the parameter "SYSDUMP=TRUE" and disabled with "SYSDUMP=FALSE".

Please only use this Rep in agreement with system diagnosis and please also make sure that you note the following information !

- To be able to create a system dump, the user ID in which the DBH is started must have at least the test privilege READ-PRIVILEGE=3 in the user catalog.

- If a DBH task is terminated, all other DBH tasks of the multitasking DBH are also stopped.

2.7.16 Rep: OPT.TEMPVIEW

This Rep re-enables the use of temporary views. Temporary views have been unsupported by default since SESAM/SQL V3.1 and should be replaced by static views.

3 Technical information

New and extended software functions are described in chapter 2.

3.1 Resource requirements

SESAM/SQL-Server V3.2 can be used on systems that have at least 64 MB main memory.

The maximum user address space of the DBH process ID in the home pubset user catalog should be large enough to avoid messages relating to an address space bottleneck during the session. The minimum size entered should be 64 MB on /390 hardware and 96 MB on SPARC64 hardware (SX product line) and SR2000. However, depending on the application, a higher value may be required for the user address space.

To estimate the address space required by the DBH as a function of the user-specific DBH options, the CD-ROM supplied contains an EXCEL chart in the 'produktinfo' directory, under the name

SYSDAT.SESAM-SQL.032.SP.D.xls

On SPARC64 hardware, the SESDBH subsystem requires approximately 17 MB class 4 memory in the address space for unprivileged subsystems above 16 MB.

The size of this memory area is set in the BS2000 parameter service with the MEMORY parameter SHXSIZE and must be adequately dimensioned.

Please refer to the document SYSDAT.SESAM-SQL.032.SP.D. (German) or SYSDAT.SESAM-SQL.032.SP.E (English) for details.

This file also contains information on the memory requirements of SESAM/SQL-DCN V3.2 and performance parameters of SESAM/SQL V3.2.

3.2 Software configuration

SESAM/SQL-Server V3.2 is compatible with the listed versions of the following software products:

Operating system version required, depending on hardware architecture:

BS2000/OSD-BC as of V 4.0A (as of V5.0 for supporting files > 32 GB)

OSD-SVP as of V 4.0A

OSD/XC as of V 1.0A

Other software required for production operation:

CRTE	as of V 2.3C,	
	as of V 2.4A	on SPARC64 hardware
LMS	as of V 3.2A	
SORT	as of V 7.7A	
TIAM	as of V13.0A	

Optional software products for specific functions:

ADILOS	as of V 6.4A	
ARCHIVE	as of V 5.0A	(for tape backup)
COBOL85	as of V 2.3A	
	or COBOL2000	as of V1.0B (see below *1)
DRIVE	as of V 3.1A	
ESQL-COBOL	as of V 2.0A	as of correction level April 2001
HSMS	as of V 5.0A50	(see below *2)
	as of V 6.0A	for COPY ONLINE with HSMS and COPY BY_ADD_MIRROR_UNIT
INFPLAN	as of V 5.3B	
JV	as of V13.0A	
ONETSERV	as of V 2.0A	(openNet Server)
openUTM	as of V 5.1A40	
SDF-P	as of V 2.1A	for supplied tool procedures
SECOS	as of V 4.0B	(see below *3)
SESAM-KLDS	as of V 3.1D	
SSC-BS2	as of V 5.0A	for SNMP management with RDBMS-MIB
TOM-REF	as of V 3.0B	

(*1) Please refer to the COBOL2000 release notice for restrictions on using functions that exceed the scope of COBOL85.

(*2) When using HSMS V5.0A, at least correction level August 2001 must be used for ARCHIVE V5.0A and HSMS V5.0A.

The SESAM/SQL-Server service tasks wait synchronously at the HSMS interface for the end of a backup or restore run.

The HSMS administrator must therefore adjust the BATCH-EXEC-TIME parameter to the expected duration of these runs with the //MODIFY-HSMS-PARAMETERS statement.

If a duration of more than 32767 seconds (around 9 hours) is expected, the optional object correction A0465190 must be used in HSMS V5.0A. This correction causes the HSMS BATCH-EXEC-TIME parameter to be ignored, allowing a batch request to wait without limit if necessary.

In HSMS as of V6.0, an unlimited wait time can be set if necessary with the following statement:

```
//MODIFY-HSMS-PARAMETERS REQUEST-WAIT-LIMITS = -  
// *PARAMETERS (BATCH-EXEC-TIME = 99999)
```

(*3) SECOS is needed for the following functions:

- use of the DMS co-ownership;

- SAT logging of SESAM events;
- creation of SESAM backups with Additional Mirror Units if the DBH does not run in either user ID TSOS or SYSHSMS.

Please also note the release notices of the involved software products in relation to the software configuration.

3.3 Product installation

SESAM/SQL must be installed with the Installation Monitor IMON. The installation information in the delivery letter and the product manual must be noted in addition to the information in this release notice.

The following activities must be completed before calling IMON:

- Before updating to SESAM/SQL-Server V3.2, all applications of the DBHs to be converted must first be terminated correctly.
- SESAM/SQL-DCN, if present, must be terminated. See section 3.4.3 for communication over different versions.
- The DBH is then terminated correctly with

```
//STOP-DBH UTM-SESSION-INFO=*DELETE (in SESADM) or
//INFORM-PROGRAM MSG='STOP,DELETE', ...
```

(UTM-SESSION-INFO=*KEEP or MSG='STOP,KEEP' are not sufficient)! Any shared modules or subsystems from the previous version that are loaded do not have to be unloaded.

- The transaction backup files TA-LOG1, TA-LOG2 and WA-LOG from the old version must be deleted.
- When updating from V3.0 or V2.2, the file containing the load options must be checked and adapted if necessary.

After completing these actions, the product can be installed with IMON. The required inputs and the installation sequence are described in the IMON Manual. The standard installation ID for all delivery units is freely selectable. IMON installs SESAM/SQL completely in executable form.

The module library is installed under the name SYSLNK.-SESAM-SQL.032 on /390 hardware and SR2000 or SPULNK.-SESAM-SQL.032 on SPARC64 hardware. We therefore strongly recommend that you use the SESAM start commands.

After successfully installing the product with IMON, the following remains to be done:

1. If the customer does not use the SESAM start commands, the following file names must be adapted to the new

names in the procedures used:

the SESAM message file (SYSMES.)
the SESAM-SDF syntax file (SYSSDF.)
the SESAM module library (SYSLNK. or SPULNK.)
the FHS module libraries for SESMON and SESUTI (SYSFHS.)
the help texts for SESUTI (SYSMAN.)

(see also section 1.2).

2. If the customer wants to use a different name for the SESAM/SQL module library, the created library must be copied using BS2000 resources. If necessary, this library must then be assigned in procedures via the link name SESAMOML or with /SET-TASKLIB LIBRARY=<modlib>.

The standard name SYSLNK.SESAM-SQL.032 or SPULNK.-SESAM-SQL.032 is also used in other files:

a) By default, the SYSSSC. files are delivered so that the name

\$.SYSLNK.SESAM-SQL.032

is used for the reload library if it cannot be found via the IMON-GPN. The default name \$.SPULNK.-SESAM-SQL.032 is correspondingly specified in the SPUSSC. files.

b) In the listed optional Rep procedures (see section 2.7), the name of the SESAM/SQL module library is requested via a parameter. The customer must specify the valid name here.

3. The message file SYSMES.SESAM-SQL.032 and the subsystem syntax file SYSSDF.SESAM-SQL.032 are activated by default during an IMON installation.

If parallel operation of two SESAM/SQL versions on one computer is foreseen, it must be ensured that each product version takes its messages from the correct message file. If necessary, the SESAM/SQL start commands therefore assign the correct message file locally for each task.

If application programs are to be started or the start commands are not to be used, the appropriate message file must be assigned with the following command (e.g. in a user logon procedure):

```
/MOD-MSG-FILE-ASSIGNMENT -  
/ ADD-FILE=<user-id>.SYSMES.<sessql>.<version>, -  
/ SCOPE=*TASK
```

where <user-id> = Storage ID of the SESAM message file
<sessql> = Designation of the product-specific
SESAM message file
<version> = Version 'nnn' of the product

A user syntax file named SYSSDF.SESAM-SQL.032.USER is provided for user-specific employment. It contains the

SDF statements of the SESAM/SQL utility programs. It must be used if the subsystem syntax file is not activated. Assignment is made with:

```
/MODIFY-SDF-OPTIONS SYNTAX-FILE=*ADD( -  
/ ADD-NAME=<user-id>.SYSSDF.SESAM-SQL.032.USER)
```

The SESAM/SQL V3.2 start commands make this assignment automatically. However, the start commands themselves are always defined via the subsystem syntax file. The subsystem syntax file must therefore be activated if the 'global configuration file' functionality is to be used with the /CONNECT-SESAM-CONFIGURATION command.

4. If necessary, the subsystems can be started by SESAM/SQL V3.2.

3.4 Product use

3.4.1 Notes on upgrading to SESAM/SQL V3.2

The following notes apply for upgrading from SESAM/SQL V3.1, V3.0 or V2.2 (referred to as the previous version in the text below). When upgrading from V3.0 or V2.2, the release notices of V3.1 and, if applicable, V3.0 must also be noted.

3.4.1.1 Migrating the databases

The following points must be observed when upgrading from a previous version to SESAM/SQL V3.2:

- Neither a restart, resynchronization with openUTM nor a media recovery are possible over and beyond the version change.
- the catalogs are migrated into the management structures with the version upgrade. The catalog spaces are migrated implicitly to SESAM/SQL V3.2 with the first SESAM/SQL V3.2 access.

You should therefore proceed as follows with a version change:

- The catalog and user spaces must be intact to be able to migrate a catalog into SESAM/SQL V3.2, i.e. they must be free of errors and must not be in the check, copy, recover pending or load running states.
- Installation is made as described in chapter 3.3.
- Start the SESAM/SQL V3.2 DBH.
- Migration is initiated automatically the first time the SESAM/SQL V3.2 DBH accesses a catalog or space. The catalog space is migrated during session initialization for all catalogs listed in the DBC (SQL Database Catalog). A prerequisite for this is that the catalogs are incorporated using ACCESS=ADMIN. If ACCESS=WRITE or ACCESS=READ is used, access

to a catalog from the previous version will fail.

- Migration into SESAM/SQL V3.2 interrupts the logical data backup since backups and logging files from a previous version cannot be used for media recovery in SESAM/SQL V3.2. For this reason, migrated spaces that are to be logged are set automatically into the "copy pending" state.

It is therefore recommended to use the "COPY CATALOG OFFLINE" statement for the first access to a catalog from a previous version with SESAM/SQL V3.2 as this migrates all spaces of the catalog in one run as well as creating the necessary backups of these spaces. You can subsequently work with all spaces of the catalog without problems.

3.4.1.2 Backup inventories

A backup from a previous version can be merged into a V3.2 DBH session for reading.

It is possible to reset to a backup of a previous version with RECOVER SPACE ... T0. The backup is thereby not migrated, but after it is read in the resulting space is migrated. The space is set to the "copy pending" state and must then be saved.

It is also possible to reset a catalog on a V3.1 or V3.0 backup with RECOVER CATALOG ... T0. However, several steps are required for the reset:

1. Reset the catalog space with RECOVER CATALOG_SPACE T0. This migrates the transferred catalog space.
2. Save the catalog space with COPY CATALOG_SPACE
3. Reset the space with RECOVER SPACESET, specifying the time stamp of the catalog backup to be reset to. It is also possible to reset separate spaces if just these are needed. The transferred spaces are thereby migrated.
4. Back up the spaces in the log, since these spaces are in the "copy pending" state.

3.4.1.3 Conversion notes for SESAM/SQL-DCN

DCN sessions of older versions must be correctly terminated with STOP-DCN (SESADM statement). This requires that all involved DBH and openUTM sessions are terminated in a transaction-free state.

3.4.1.4 Converting the user programs

CALL-DML and SQL user programs do not have to be compiled or linked separately. Assignment of the module library belonging to SESAM/SQL V3.2 is sufficient

openUTM applications only have to be regenerated and relinked if the connection module is reloaded from a module library specified in the generation.

In this respect, please note an extension to openUTM as of V5.1A40: As of this correction level, in the KDCDEF DATABASE LIB=... control statement, the reload library can be specified via a "logical ID" with respect to the IMON installation. The connection module is then loaded dynamically from the current SESAM/SQL module library. This function is described in the Release Notice and the README file of openUTM V5.1.

3.4.1.5 DRIVE interface

DRIVE as of V3.1 can be used with SESAM/SQL-Server V3.2.

3.4.1.6 Reverse migration

Reverse migration to a previous version is only possible with the support of your customer service center because several pre-checks and manual operations are required to ensure correct operation.

3.4.2 Using different correction delivery levels in 24 hour operation

If no SESAM/SQL subsystem is loaded while a DBH is running in 24 hour mode and a new correction level is read in during operation, the DBH continues working with the old correction level. If the DBH starts a new service task after the new correction level has been read in, this service task is started with the correction level which matches that of the DBH.

If one or more SESAM/SQL subsystems are loaded while a new correction level is read in, the SESAM subsystems do not automatically take over the new correction level. You have two options in this case:

1. Stop all tasks attached to the subsystems and also stop the subsystems themselves with the BS2000 command:
/STOP-SUBSYSTEM -
/ SUBSYSTEM-NAME=<structured name 1..8>
Then restart the subsystems with the BS2000 command:
/START-SUBSYSTEM -
/ SUBSYSTEM-NAME=<structured name 1..8>
Subsequently, the SESAM/SQL tasks can be restarted. These tasks now load the new correction level.
2. If you cannot stop the subsystems because you cannot stop the tasks attached to the subsystems at this time, you must prevent any newly started tasks from attaching themselves to the subsystems. You achieve this by creating a local subsystem catalog from within the subsystems (SESKOM, SESDBH, SESKOMOD, SESKOMMD and

SESSQLRT) (see the manual "DSSM/SSCM, Subsystem Management in BS2000/OSD"). The local subsystem catalog is created with the SSCM statement //START-CATALOG-CREATION and the subsystem definitions are entered with the //ADD-CATALOG-ENTRY statement.

You then load this local subsystem catalog with the BS2000 command:

```
/LOAD-LOCAL-SUBSYSTEM-CATALOG CATALOG-NAME = -  
  <filename 1..54 without-gen-vers>
```

into the task-local user address space (class 5 memory).

Subsequently start the separate subsystems with the BS2000 command:

```
/START-LOCAL-SUBSYSTEM -  
  / SUBSYSTEM-NAME=<structured name 1..8>
```

You must carry out this procedure in each task in which programs are to run with the new SESAM/SQL correction level. You must thereby note that SESAM/SQL starts any DBH child tasks and the service tasks as batch tasks. In this case, you must write the above commands into a user LOGON procedure to ensure that they are executed automatically when the batch tasks are started.

The task-local subsystems can be stopped with the BS2000 command:

```
/STOP-LOCAL-SUBSYSTEM -  
  / SUBSYSTEM-NAME=<structured name 1..8>
```

The local subsystem catalog can be unloaded with the command:

```
/UNLOAD-LOCAL-SUBSYSTEM-CATALOG
```

3.4.3 Version-independent communication and parallel operation with SESAM/SQL

SESAM/SQL-Server V3.2 only works locally with SESAM/SQL-DCN V3.2; all DBHs and DCNs in a configuration must have the same version.

Version-independent communication is generally only possible for different configurations with SESAM/SQL-DCN. If both configurations are on the same host, they must be assigned different configuration IDs.

1. SESAM/SQL user programs with a connection module of version \geq V2.0 can communicate via SESAM/SQL-DCN with a SESAM/SQL-DBH V3.2.
2. SESAM/SQL user programs with a version 3.2 connection module can communicate with a SESAM/SQL-DBH as of V2.2. A correction level \geq V2.2A60 is required for SESAM/SQL V2.2.

As in the previous version, the maximum size of the communication buffer may not exceed 32 KB for version-independent com-

munication with version 3.2.

If the subsystem syntax file of a previous version is active, you can also start SESAM/SQL V3.2 programs with the start command by specifying VERSION=3.2. These commands access the user syntax file SYSSDF.SESAM-SQL.032.USER

3.4.4 Using larger process memory with openUTM

As of 128 KB process memory (specified with the KDCDEF control statement MAX VGMSIZE) it is recommended to use the KDCDB macros from the SIPLIB.SESAM-SQL.032.MACUTM.1 library.

3.4.5 User ID of the HSMS archive

If HSMS is used for tape backup, the HSMS may also be located in a user ID other than that of the DBH if the DBH user ID is a co-owner of the HSMS archive and HSMS as of V6.0 is used.

3.5 Obsolete functions (and those to be discontinued)

none

3.6 Incompatibilities

Apart from the following restrictions, SESAM/SQL V3.2 is fully compatible to SESAM/SQL V3.1.

3.6.1 Backup files

The backup files are neither upwards nor downwards compatible with those of version 3.1 and earlier. The files concerned are:

- Transaction backup files TA-LOG and WA-LOG
- DCN backup file SES.DLG
- Logging files DA-LOG and CAT-LOG
- Backup inventories of catalog and user spaces

The measures required when updating to SESAM/SQL V3.2 are described in section 3.4.1.

3.6.1.1 Backup files and co-ownership

The SESAM Database Handler (DBH) tries to use backup files located in the user ID of the Database (DB ID). To do so the backup files have to be created as shared files in the DB ID by the DB administrator before being used by the DBH. If they are not existing in the DB ID the SESAM DBH creates

*4
*4
*4
*4
*4
*4
*4

such files in the DBH ID because it is not allowed to create files in a foreign user ID. This is common up to version V3.1.

Additional to this behavior from version V3.2 on the SESAM DBH tries to create backup files in the DB ID first even when they are not existing. This is possible if the co-ownership of the DBH ID exists for the logging file names.

Using the co-ownership functionality has two advantages:

- the user has not to create shared backup files in the DB ID to use them from the DBH ID
- the security of the backup files is improved because only user IDs with a defined co-ownership are allowed to use them

That means:

Not in all cases of failure the SESAM DBH can decide if there is an existing co-ownership for special files. In such a situation the reaction of the SESAM DBH is now incompatible to former versions. This means:

- SESAM DBH generates a TYPE message to be answered
- the DB administrator has to decide on which medium the backup file should be created by answering the TYPE message
- SESAM DBH then tries to create the file again on the DB ID

This will be done three times. If it fails the file is created on the DBH ID. This new reaction guarantees that the DB administrator intentional wants to shift the DB logging files from the DB ID to the DBH ID.

E.g. DMS returncode are:

```
DMS051B REQUESTED USER ID NOT IN PUBSET
DMS0501 CATALOG EENTRY NOT AVAILABLE OR WILDCARDS IN USER IDENTIFICATION
DMS0512 REQUESTED CATALOG CANNOT BE FOUND. COMMAND TERMINATED
DMS05A1 INVALID FILE OPERAND COMMAND NOT PROCESSED
DMS05A8 DEVICE NOT GENERATED OR SPECIFICATION INVALID. FILE ASSIGNMENT REJECTED
```

3.6.2 CHECK FORMAL

When checking a table, CHECK FORMAL no longer reports one of the errors found. It outputs instead a general exception reporting that the space is defective. The detected error is entered in the exception file and the space is set as defective.

If just an index is detected as being defective on the space, an exception is also output and the error entered in the exception file. However, only the index is set as defective. Other exceptions only lead to the check being aborted. If an index is invalid on the space, e.g. due to LOAD, only a warning

is output.

3.6.3 REORG

The enhanced process control with REORG can be seen generally as an extension. However, the following points are incompatible:

- Whether or not the space file was created by the user is no longer taken into account. If the previous location of the file on the volume is to be retained, COPY must be specified explicitly.
- A space is moved if the storage group defined in the catalog differs from that on which the space is stored. It is not imperative that an ALTER SPACE was issued. The space may also have been moved with BS2000 COPY. If a move with BS2000 COPY is to be retained, it must be repeated with ALTER SPACE.
- A space is copied back and not moved if a work file is specified. Until now, the work file was ignored when the move was requested due to the metadata. A move is also not made on tape for REORG with a work file.
- The behavior if the catalog is not in the DBH ID has changed. Catalogs in foreign IDs are handled as catalogs in the DBH ID. A prerequisite for this is that the DBH ID is a co-owner of the catalog files. COPY must be specified to reorganize catalogs in foreign IDs without the DBH ID being a co-owner of the catalog files.

3.6.4 DB backup with HSMS and concurrent copy

The concurrent copy method is used for online backup with HSMS and backup with additional mirror units. If the database to be saved is on a shared pubset, this function is executed on the master system of the shared pubset. HSMS as of V6.0 must therefore also be installed there.

With online backup, the product JV (Job Variables) is required in all cases on the system and with a shared pubset, on the master system too.

Database files on private volumes cannot be backed up with the concurrent copy method. In this case, using HSMS it is only possible to make an offline backup without additional mirror units.

To use the concurrent copy method with Symmetrix TimeFinder, the DBH task requires the TSOS or HSMS administrator privilege or a customer privilege that has rights for backing up additional mirror units. If the DBH task does not run in either user ID TSOS or SYSHSMS, the product SECOS is needed for granting the privilege.

3.6.5 Virtual hosts

In order for SESAM/SQL to be able to use a virtual host, as of SESAM/SQL V3.2 an assignment for the application SES032<cnf> must be entered in the file \$TSOS.SYSDAT.BCAM.APPLICATIONS (where <cnf> is the configuration name). You will find a description of communication with virtual hosts in section 8.3 of the manual "Database Operation" on page 329.

3.6.6 Utility Monitor

SESAM/SQL V3.2 contains changes to the Utility Monitor masks due to new parameters in the utility functions and implementation of various change requests.

Differing behavior with mask and data inputs has been corrected by introducing wild card characters in the Utility Monitor. In an input file, a string in the form 'A\C' will in future be rejected as a syntax error. The correct form is 'A\ \C'.

Otherwise, all changes in the V3.2 Utility Monitor are upwards compatible. All functions of the previous versions are still fully supported.

3.6.7 SESAM Monitor SESMON

In the SESDCN mask CAPACITY, the class sorting of SESAM message output has been changed to accommodate extension of the maximum message length.

Sorting is now <=2k,<=4k,<=8k,<=16k,<=32k,<=64k instead of the previous classes <=1k,<=2k,<=4k,<=8k,<=16k,<=32k.

3.6.8 FITC > 32 KB

Each thread (defined with the DBH THREADS option) adds 64 KB to the memory required by the DB since 2 x 64 KB memory is now used for the input and output containers of each thread instead of 2 x 32 KB as previously.

3.6.9 WebTA solution for graphical user interfaces

The previous support for the graphical user interfaces of the Utility Monitor, SESAM Monitor (via FHS-DOORS) and SESADM (via SDF-DOORS) applications has now been replaced with a unified WebTA link for these applications.

3.6.10 User programs in configuration with SESAM/SQL-DCN V2.0 or V2.1

User programs in a configuration with SESAM/SQL-DCN V2.0 or V2.1 can no longer communicate with a SESAM/SQL-Server V3.2

DBH.

3.7 Restrictions

3.7.1 SAT support

The SAT events generated by SESAM/SQL do not yet contain SESAM/SQL-specific information.

3.7.2 Linked-in variants on SPARC64 hardware

The linked-in variant of SESAM/SQL is not available for SPARC64 hardware. An attempt to call it will be rejected with Call-DML-Status 99/X5 or SQLSTATE 81SCE (meaning: function not supported in the current hardware environment).

3.8 General information

The following sections do not constitute changed behavior with respect to the previous version. They are intended to provide the user with helpful information for using the product.

3.8.1 Enhancement of error reaction with LOAD

In this release version V3.2A30 the error reaction with LOAD ist extended.

Using the LOAD format 'DELIMITER_FORMAT, TRANSFER_FORMAT and user defined format' the values of the input data could be different from the column definition format of the database. If - in case of CHARACTER or CHARACTER VARYING - the length of the input data is longer than the definition length of the database column, the input data will be truncated without any warning but stored. This operation is common since Version V2.0.

As the input data also could be wrong from this release on there will be an additional warning in the LOAD exception file if such values will be truncated. But the record will be stored as usual.

The warning includes the SQLSTATE 01004 (strings truncated) and the name of the corresponding column.

LOAD statements which today receive the SQLSTATE 00000 under these circumstances will now receive the SQLSTATE 01SA8 ('LOAD exception file includes at least one record').

3.8.2 Example database

The example database AUFTRAGKUNDEN is included in the delivery scope of SESAM/SQL-Server. This SESAM/SQL database is described in chapter 3 of the Core Manual. The library SIPANY.-SESAM-SQL.032.MAN-DB contains all components that you need to try out all the examples described in the manuals and to develop your own applications in an orderly environment.

3.8.3 Tools for SESAM/SQL-Server V3.2

A variety of tools are delivered with SESAM/SQL V3.2. These tools are not part of the license and are not subject to our maintenance obligation.

These tools, e.g. SESDIAG, SEUGCR, etc. are delivered without SESAM start commands. If there is nothing else mentioned, they must be started from the product specific module libraries

SYSLNK.SESAM-SQL.032 resp.
SPULNK.SESAM-SQL.032.

SESAM/SQL requires components of the Common RunTime Environment CRTE to execute these tools correctly. Running on /390 hardware as well as on SPARC64 hardware the library \$.SYSLNK.CRTE is needed.

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3.8.3.1 Tool DSQL (DirectSQL)

DSQL (SESAM-DirectSQL) provides an easy way to enter SQL statements directly at the terminal for execution by SESAM/SQL. From the viewpoint of SESAM/SQL, DSQL is a normal SQL application, that uses dynamic SQL to execute SQL statements entered by the user. All types of SQL statements (DML, DDL, SSL, Utility) that can be executed with EXECUTE IMMEDIATE, and SELECT statements processed as dynamic cursors are supported, whereby the number of hits is displayed on screen with the SHOW-FILE command.

The program and a description of it are provided in the library SIPANY.SESAM-SQL.032.TOOLS.

3.8.3.2 Tool SESAMDA (shows loaded DBHs and DCNs)

SESAMDA checks which DBHs and DCNs are loaded or which POOLS have been set up. After SESAMDA has been loaded, you can display a summary of its functions and commands by entering HILFE/HELP.

The program is located in the module library SYSLNK.SESAM-SQL.032 or SPULNK.SESAM-SQL.032 (on SPARC64 hardware).

3.8.3.3 Tool SEMSTAT (evaluates file outputs of SESMON)

SEMSTAT is used for evaluating the file outputs of the SESAM Performance Monitor SESMON. With SESMON, you can create a BS2000 file as well as an ASCII file with the results of the evaluation, that can for example be used in MS Excel on a Windows PC for graphical analyses. Please refer to the SEMSTAT description for detailed information.

The program is located in the module library SYSLNK.SESAM-SQL.032 or SPULNK.SESAM-SQL.032 (on SPARC64 hardware).

The description is a PDF file located in the directory produk-
tinfo of the CD-ROM that accompanies SESAM/SQL.

3.8.3.4 Tool SESDIAG (diagnostic tool)

SESDIAG is a diagnostic tool that provides information about catalogs, spaces and blocks. This tool can also be used to determine the space states.

The program is located in the module library SYSLNK.
SESAM-SQL.032 or SPULNK.SESAM-SQL.032 (on SPARC64 hardware).
The description is located in the library
SIPANY.SESAM-SQL.032.TOOLS.

3.8.3.5 Tool INFOTAB (information about a table)

INFOTAB outputs general information about a table, the associated space, a list of attributes (columns) and a list of the SQL default values

The program and its description are located in the library
SIPANY.SESAM-SQL.032.TOOLS.

3.9 Procedure in the event of errors

3.9.1 General

To detect user errors, SESAM/SQL applications should be started with

```
/MODIFY-JOB-OPTIONS LOGGING=PARAMETERS(LISTING=YES)
```

To get the necessary documentation that you need for error diagnosis, always run SESAM/SQL-DBH and SESAM/SQL-DCN with

```
/MODIFY-TEST-OPTIONS DUMP=YES
```

and log the session to a file. If the SESAM program components detect an error, they automatically create a memory dump.

The administrator should grant at least read privilege 3 for test and diagnosis to the DBH ID to also allow SESAM/SQL to create system dumps for diagnosis. The test privilege is set once with the BS2000 command

```
/MOD-USER-ATTRIBUTES TEST-OPTIONS = *PAR(READ-PRIVILEGE=3)
```

and then remains stored in the user catalog.

If the DBH is loaded as a multitasking system, error documents can also be produced in other tasks that were not started by the administrator.

Information on the documentation to be saved if a consistency check occurs is described in the following manuals:

and SESAM/SQL-Server V3.2A Database Operation
 SESAM/SQL-Server V3.2A Messages

To create effective error documentation when you suspect DBH errors (e.g. illegal status, wrong response, etc.) you can do the following:

- Set job switch 13 :
 - > Generates an automatic dump when the DBH program is stopped.
- Turn traces on :
 - //SET-DBH-MSG-TRACE (SESADM statement)
 - or
 - /INFORM-PROGRAM MSG='TRACE=ON'
 - > Provides information on the message transfer between the DBH and the user program (e.g. which statement is transferred to the DBH).
- //SET-DIAGNOSIS-DUMP-PARAMETER -
 ,DUMP=*ON(SELECT=*CALL-DML(STATE=xx))

```

or
- /INFORM-PROGRAM MSG='SES,OPT,DIAG,STATUS=xx'
- //SET-DIAGNOSIS-DUMP-PARAMETER -
  ,DUMP=*ON(SELECT=*SQL(SQLSTATE=yyyyy))
or
- /INFORM-PROGRAM,MSG='SES,OPT,DIAG,SQLSTATE=yyyyy'
---> Activates additional diagnostic functions in the
      program while it is running that may create a dump
      depending on the results (e.g. when a certain
      status occurs or SQLSTATES).
      However, the program then runs much slower.

with      DUMP=*OFF(SELECT=*CALL-DML) or
          DUMP=*OFF(SELECT=*SQL)
the function is turned off again.

```

Additional documentation may be needed for the service tasks that SESAM/SQL-Server uses for certain jobs. The execution listing and a possible dump should then also be made available for diagnosis.

In some cases it may be necessary to analyze the execution plan for an SQL statement that SESAM/SQL-Server creates. Create such a plan with the pragma EXPLAIN and submit it for analysis.

Additional diagnostic information can be gathered through SESMON or SESCOS traces.

The specific documentation that may be needed and how to create it is covered in the manual
 SESAM/SQL-Server V3.2A Database Operation

The documentation that you create must in all cases include a precise description of the error condition and information on if and how the error can be reproduced.

For diagnostic purposes, you must make all dumps and listings available to your Support Center (ITPS SF NAM DB). *5

For errors in connection with openUTM, ESQL-COBOL, DRIVE, etc. the release notices of the respective products may contain important information.

3.9.2 Procedure in the event of a defective CAT-REC file

If the CAT-REC file that is needed for RECOVER is defective or no longer available, you must contact your Support Center. Their personnel are trained to make the necessary repairs.

4 Hardware support

SESAM/SQL V3.2 will run on all Business Servers supported as of BS2000/OSD-BC V4.0, OSD-SVP V4.0 or OSD/XC V1.0. SESAM/SQL V3.2 runs in SPARC code on SPARC64 hardware.