

SyncSort for z/OS

TECHNICAL SPECIFICATIONS

RELEASE 1.3

INTRODUCTION

SyncSort for z/OS is a high performance sort/merge/copy utility. It is designed to exploit the advanced facilities of the z/OS operating system and zSeries computers. SyncSort for z/OS also supports the OS/390 operating system and S/390 and compatible computers.

PERFORMANCE

SyncSort is designed to provide significant performance benefits and operate efficiently in 64-bit or 31-bit environments.

SyncSort exploits system characteristics to achieve significant reductions in total CPU time and elapsed time.

Performance techniques that improve CPU time include optimization for specific processor types and specific I/O devices, proprietary sorting algorithms, and advanced access methods. SyncSort uses 64-bit virtual storage through memory objects on zSeries processors to improve elapsed time performance.

SyncSort's dynamic optimization responds to system activity such as CPU utilization, DASD contention, real and virtual storage availability, and paging rates. SyncSort records system activity in its database and optimizes processing based on historical patterns.

SyncSort also exploits parallel access volume (PAV) technology, reducing elapsed time by up to 30 percent.

SyncSort exploits the new MIDAW and System z9 Integrated Information Processor (zIIP) facilities available on z9 processors. SyncSort's use of the MIDAW facility reduces CPU time and elapsed time. The zIIP facility allows many sorts to have a portion of their processing directed to the zIIP, thereby lowering the traditional CPU time cost associated with sorting. The zIIP exploitation also liberates conventional CPU cycles for use by other applications that do not exploit the zIIP facility.

SORT/MERGE/COPY PROCESSING

- EBCDIC, ASCII, user-defined, or locale-defined collating sequence.
- Up to 128 control fields, with total length up to 4092 bytes. Fields can be anywhere in the record.
- Standard field formats, including character, binary, packed decimal, zoned decimal, fixed point, floating point, various date formats, and various signed formats.
- High performance MERGE processing of up to 100 presequenced data sets into one sorted output data set.
- High performance COPY function (SORT FIELDS=COPY), used alone or with data editing.

RESOURCE MANAGEMENT FEATURES

- **Dynamic Storage Management.** Optimizes resource use by directing SyncSort to select sortwork devices with the least contention and highest transfer rates and by allocating address space and data space to concurrently running sort jobs based on a balance between their needs, system load, and the needs of other jobs on the system.
- **Dynamic Sortwork Allocation.** Minimizes DASD resources used for sorting by acquiring sortwork incrementally throughout the sort step.
- **MAXSORT.** Sorts large data sets on limited DASD space. Includes automatic breakpoint/restart.
- **PARASORT.** Cuts elapsed time for sorts that read multiple volume or concatenated tape SORTIN data sets by processing the input volumes in parallel. Elapsed time reductions of up to 20 percent for 2-way input and 33 percent for 4-way input can be achieved.

VISUAL SYNC SORT FOR Z/OS

Visual SyncSort for z/OS is a separate PC product included with SyncSort for z/OS. It is designed to allow programmers and non-programmers alike to easily create and manage SyncSort applications for the mainframe environment. With Visual SyncSort, you can create new sort, merge, and copy applications, or you can import and modify existing ones. Visual SyncSort saves programmer time while taking full advantage of the processing power of SyncSort for z/OS.

DATA UTILITY FEATURES

- **DB2 Query.** Allows SyncSort SORT or COPY operations to directly retrieve data from a DB2 database based on a query specified by an SQL SELECT statement. This feature improves performance over DB2's DSNTIAUL program by eliminating the need for setup steps and user-written exits. Most SyncSort data manipulation and report functions can be applied to the records created by the query operation.
- **Multiple Output.** Output data from a single sort pass can be directed to multiple SORTOUT data sets (OUTFIL). Each data set can be uniquely grouped, selected, and edited.
- **SortWriter.** Creates full-featured reports, without the need for COBOL.
- **Data Editing.** Permits easy selection and formatting of records:
 - INCLUDE/OMIT selects input records based on comparisons between fields or between fields and con-

SyncSort for z/OS RELEASE 1.3

starts. Supports cultural environment locales, bit-level processing, and complex logical conditions.

- INREC/OUTREC reformats and edits input/output records: Adds, removes, and reorders fields; inserts spaces, characters, binary zeros, hex digits, and constants representing the current date and time; positions fields with column alignment; converts numeric data to printable or other common data format; edits numeric data with supplied or user-defined editing masks; supports editing and arithmetic calculations of century window date formats; inserts sequence numbers; supports repetition factors up to 4095; splits records into multiple records; converts variable-length input records to fixed-length output records; converts fixed-length input records to variable-length output records; trims repetitive bytes from the end of a variable-length record; changes specified strings based on a lookup table; translates the case of EBCDIC fields; translates fields based on an alternate collating sequence; allows arithmetic calculations among fields within a record, among fields and constants, and among constants and constants; allows left or right justification of fields with options for deleting or inserting leading and trailing characters, changing the length of the field in the output record as well as selecting, deleting, and ignoring characters throughout the entire input field; enables reformatting of records based on specified criteria; allows reformatting of only selected portions of records; allows the extraction of fields that are of variable-length/position in a record (the resultant parsed fields then may be used to the same extent as fixed fields, which have a fixed position p and a fixed length l).
- SUM consolidates records with equal sort keys and optionally totals values in specified fields. Optionally writes eliminated records to a separate data set.
- DUPKEYS performs SUM functions and also calculates average, maximum, minimum or sum values in specified fields.
- SKIPREC/STOPAFT processes or skips a specified number of records. Useful for testing.
- **JOIN Facility.** Gives you the ability to pair records from two source files. Each record from the first file with a given value in a specified field (the join key) is paired to each record from the second file with the identical value in a specified field in that record. Options are provided to control the use of both the paired and unpaired records. A new record can be created from selected fields in each of the paired records. The unpaired records can also be retained for subsequent processing.

INPUT/OUTPUT

- BSAM, VSAM, HFS, and BDAM formats and devices.
- Hiperbatch, BatchPipes®.
- Variable-length record validity testing, and processing of variable-length records shorter than SORT/MERGE control fields or INCLUDE/OMIT compare fields.
- Automatic secondary allocation, space release, system-determined block size support on SORTOUT.

INTERMEDIATE FILES

- Supports up to 255 intermediate work files, either in JCL or through dynamic allocation.
- Dynamic allocation supports SMS STORCLASS.
- Automatic space release, secondary allocation.

EXIT SUPPORT

- Supports many user exits, including E15 and E35 exits written in C, COBOL, Assembler, or REXX.
- Supports FASTSRT parm of COBOL compilers.

UTILITY PROGRAMS

- High performance replacement for IEBGENER (BetterGener).
- Variable-length record analysis (HISTOGRM).
- Default options report (SYNCLIST).

INVOCATION

- Invoked through JCL or through programs written in COBOL, PL/1, Assembler, or FORTRAN.
- Supports 24-bit and 31-bit parameter lists.
- \$ORTPARM facility can override parameters and control statements passed by invoking programs.
- Supports IDCAMS BLDINDEX interface.

COMPATIBILITY

- Executes on servers that are capable of running the z/OS or OS/390 V2R10 operating systems.
- Compatible with existing applications written for IBM's DFSORT or for prior SyncSort releases. Requires no changes to current JCL, control statements, parameter lists, exits, and all installed system software, including DB2 and IMS utility sorts.
- Installation options provide full compatibility between sort products.

INSTALLATION

- Provides an easy-to-use interactive installation program (SYNCINIT). Can be installed with or without SMP/E. Non-interactive installation also available.
- Can be installed in a non-reentrant or reentrant configuration.
- Installation and maintenance files can be downloaded from Syncsort's website with an ID and password provided by Syncsort Inc.
- Installation available through IBM's SystemPac.

