24 May 2018

BoF-PSS2 CHANGE HISTORY

This document contains the change history of the Bank of Finland Payment and Settlement Simulator, BoF-PSS2. For information about errors found in the current or earlier version of the Simulator see BoF-PSS2 Known bugs document.

A three-digit convention is used in the version numbering, where the last number represent bug fixes to the current version, the middle number represents small enhancements and the first number is used for major new versions, where probably the database structures are also changed. The general idea is to have about one major new version a year.

Change history

9.2.1 Enhanced support for ABM (Agent based modelling). April 2018

- Standardisation of the algorithm interface to better support ABM algorithms
- Inclusion of 2 ABM liquidity management AI algorithms to the distribution.
- Import task automation tool allowing. Automation of tasks from importing to running of a benchmark simulation.
- Automatic generation of participant data (part of the import automation tools)

8.0.0 Rationalization of the simulator's database. June 2017

- Rationalization of the database structure of projects. Basic participant and transaction information is not duplicated anymore. Also redundant output data has been removed.
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7.0.0 Automation tools to perform CCP novation and netting on trade data

- CCP novation algorithm for trades
- CCP netting algorithm
- Generation of balances based on Lower Bound of liquidity
- Enhancement of the stress tester to allow users define SQL-filters to direct scenario creation

6.0.0 Automated stress testing tool

- First version of the automated stress testing tool
- Support for multilateral DVP and PVP was restored. The simulator supports the linking of multiple items. Number of linked transactions can be more than 2.
- The java version was updated to 1.8
- The simulator now supports also newer versions of MySQL and MariaDB. The difference is the newer versions do not allow the database files to be stored in arbitrary places and they must be stored in the data directory of the database engine.

4.1.0 Support for Business day & refactoring

- Support for business days occurring on multiple calendar days

- Possibility to define start and end of business days individually for each day of a simulation.
- Partial refactoring of code (day transition treatment of basic data structures, some code consolidation, ...)

3.2.1h Java update and support for MS SQL-SERVER

- Support form MS SQL-SERVER 2012
- Update of Java JRE to 1.7

3.2.0 Removal of commercial MySQL connector

- Removal of the commercial MySQL connector from the binary package
- Support for MariaDB 5.2 & 5.3
- standardization of DB connections to use JDBC interface

3.1.1 Bug fixes in version 3.1.0, March 2012

- Enhancements and bug fixes in time series report generation

3.1.0 Credit cap additions, October 2011

- Possibility to set upper limit for bilateral or multilateral liquidity outflow with credit cap feature in BLIM data

3.0.0 New main version with support to reservations, July 2010

- Possibility to include time estimation for algorithms in order to replicate time usage in production system. Users are allowed to implement their own time estimation algorithms or use the time estimation algorithm provided with the software.
- Structural change to allow replication of parallel processes.
- Possibility to customize the handling of events (changes in bilateral limits introduction of transactions, changes in credit limits etc.) and the rules related by introducing customized event handling algorithms overriding the default behaviour. Event handling algorithms can be imported as user modules with algorithm type SEH.
- Database tables and import facilities for reservation data.
- Enhancement of processing speed.
- Diminution of memory consumption.
- User interface enhancements.
- Process log database tables and logger facilities.

2.4.0 Network Analysis and command line interface, August 2009

- Integration of Sandia's network analysis tool. The integration allows the generation of some basic network indicators and the exporting of graph data.
- The command line interface makes it possible to import data, define simulations and simulation results directly either from another program or using command line commands.
- Enhancement of cross-check validations.
- Liquidity injections.
- Migration to Java 1.6

2.2.6 Bug fixes in version 2.2.4, June 2007

- Fixed the bug of temp folder location which caused possibility of losing the database content during data imports.

2.2.4 Bug fixes in version 2.2.3, March 2007

- Routines for maintaining the received and sent balances in receipt reactive gross settlement (RRGS) were fixed.

2.2.3 Development version, not released (February 2007)

- Queue sorting order is fixed to include also the third sorting criteria i.e. transaction Id.

2.2.2 Bug fixes in version 2.2.1, December 2006

- Fixed the bug in system level reports. Bug was caused by data format conversion problems in report generation and updated Java-MySQL connector.

2.2.1 Bug fixes in version 2.2.0, end of September 2006

Bug fixes

- Bug, which was causing missing days in ACST statistics and other queue statistics in multi day simulations with receipt reactive gross settlement (RRGS), is fixed.

2.2.0 Fourth production version, available at the end of August 2006

New features:

- Bilateral limits and multilateral limits for net flow of payments during a day.
- Bilateral statistics
- Algorithms to be used in simulations with bilateral limits: Entry algorithm ENBILIM1, settlement algorithm SEBILIM1, end algorithm ENDRBIL1 and several queue release (QUB) and bilateral offsetting (BBS) algorithms.
- Receipt reactive gross settlement (RRGS) is a liquidity saving algorithm where the settlement of low priority payments is conditional to value of incoming payments.
- Group code algorithms allow bundling the settlement of arbitrary many transactions together. Previously with link codes only two transactions were possible to tie together.
- Starting from version 2.2.0 systemID values are defined at the same time when the first system data set for given system is saved. After this the systemID is selected from drop down list to avoid typing errors. SystemID's are stored in the asid-table of system database.
- User object data-handles are included. These can be utilised by user created algorithm modules for storing of data structures that need to be accessed from other algorithm modules.
- MySQL 5.0 support
- Java runtime environment (JRE) is updated to version 1.5.
- A 64-bit version of the software is available.
- JavaDoc documentation of the simulation software is available.

1.2.0 Third production version, available at the end of January 2005

New features:

- Progress bars are developed to make following the run time progress of simulations and cross checking easier.
- Entry algorithm for forced settlement of highly urgent payments (ENFORURG) is presented. It can be used to find out how large liquidity reservations are needed to guarantee settlement of payments above given priority level.
- In netting algorithms with fixed execution times (e.g. MNSETTLT and PNFIFOPT), the maximum number of nettings is raised to 40 per day. NOTE! If these algorithms have been used in system definitions created by earlier versions than v1.2.0, the increased number of time parameters will become available only when the netting algorithm is deleted and reinserted to algorithm list in *Define system data* window.
- Starting time of netting cycle is added as an optional parameter to interval based netting algorithms (e.g. MNSETTLI and PNFIFOPI).
- Simulator is now compatible with MySQL versions 4.0.20 and higher. However, version 4.1 of MySQL is not yet tested.
- Ready made templates for exporting all data fields are included for each output table type.

Enhancements in run time performance:

- Tailored start-up parameters are included for setting memory reservations of java (the simulator) and MySQL-database. See new section 2.6 in user manual for more details.
- Settled transaction are written to output statistics during simulation day in large simulations (over 200 000 transactions).

Bug fixes

- Setting account balances with DBAL-data is changed to override *transfer balances to next day*-functionality in multi day simulations.
- Liquidity injections and end-of –day settlement features now function also with DVP-data.
- MNSETTLC is corrected to not break DVP-link codes in multi system simulations with non synchronised submission of linked transactions.
- Transactions should no longer vanish if liquidity injections are available for only some participants or accounts.
- Non-DVP transactions imported with empty link code should no longer be duplicated if cross-checking is skipped in the execution phase.
- Cross Check is reporting dates before year 1900 as errors.

User manual, Databases and files description, Algorithm descriptions and user module development guide and Known bugs document were updated.

1.1.0 Second production version, available probably in early September 2004

New features:

- Possibility to by-pass cross-check during simulations
- Participant ID field moved into sortable position in the Account comparison report

Bug fixes:

- Injection returns according to parameters (sometimes a too small amounts were returned.
- Decimal separator according to specifications in Account comparison and System comparison reports.
- PNDEQUEC, PNFIFOPC and MNSETTLC corrected so that netting is tried after every change in queues or liquidity
- BOBASIC1 corrected so that off-setting is tried after every change in queues or liquidity

Ref. manual was updated with the new features and some amendments were made to template/csv-file descriptions and DVP-processing.

1.0.0 First production version, available since 21.04.2004

- Fix in the import input file screen of 'rows with errors', the number given did not include all errors found.
- Fix in the error-file of import input file, the row reference to the original file was too narrow for large tables.
- Fix in the export out file screen, E-INDEXNUM was added to the selection fields in the TEST-table

0.9.6 Last beta version