| T2S CHANGE REQUEST |||
|---|---|---|
| **General Information (Origin of Request)** <br> ☐ User Requirements (URD) or GUI Business Functionality Document (BFD) <br> ☒ Other User Functional or Technical Documentation (SYS) |||
| **Request raised by:** Eurosystem | **Institute:** 4CB | **Date raised:** 03/12/2024 |
| **Request title:** RTS Enhancements: Optimisation process, reduce coupling and stop sending internal messages. || **Request No.:** T2S 0845 SYS |
| **Request type:** Common | **Classification:** Scope Enhancement | **Urgency:** Normal |
| **1. Legal/business importance parameter:** || **2. Market implementation efforts parameter:** |
| **3. Operational/Technical risk parameter:** || **4. Financial impact parameter:** (provided by 4CB)[1] |
| **Requestor Category:** 4CB || **Status:** Registered |

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**Reason for change and expected benefits/business motivation:**

Since 2019, the proportion of transactions settling in RTS (versus NTS) has been regularly increasing and represented in 2023 up to 43% of total settled volumes on T2S platform.

This trend is expected to accelerate with the implementation of T+1 project and the onboarding of end investor accounts and markets in the coming years. So, there is the need to enhance the RTS process to allow T2S platform to face these upcoming challenges, in particular to support additional volumes, better handle peaks of volumetry and foster the usage of T2S CPU during this period.

This change request gathers three evolutions proposed in the context of the T2S Strategic Evolution initiative:

One evolution focuses on improving the optimisation process (which consumes today almost 70% of settlement engine capacity during RTS)

   ✓   Improve Optimisation process (separate cash optimisation from securities optimisation)

Two evolutions focus on enhancing the interaction between Settlement module and LCMM via an optimised usage of resources and the removal of useless messages.

   ✓   Updating during RTS (reduce the coupling between SETT and LCMM)

   ✓   Internal messages (Stop sending internal messages SETT/LCMM)

➢ **Improve Optimisation process**

The RTS optimisation process allows the identification and the selection of pending Settlement Instructions and Settlement Restrictions that are able to settle with success only when they are submitted together to a settlement attempt.

Currently, it is triggered in real time and in the same manner for cash optimisation and securities optimisation. However, cash optimisation requires high CPU consumption due to the high number of transactions that can be involved, with a low rate of successful results[2]. It implies thus an overconsumption of resources which could be reduced without affecting settlement efficiency.

➢ **Updating during RTS (reduce the coupling between SETT and LCMM)**

The current communication architecture between LCMM and SETT regarding the data updates (instructions status, positions, balances....), is based on the coupling in terms of the data exchanged:  during RTS, the update of

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[1] Low < 100kEUR < Low-Medium < 200 kEUR < Medium < 400kEUR < High < 700kEUR < Very high

[2] A minor change (PBI000000234483) was created by 4CB in order to create counters that will provide additional figures on the expected benefits in the context of the Preliminary Assessment (PA).

instruction status on LCMM platform is done directly by SETT in the same order as in the Settlement module, assuring the consistency of information between SETT and LCMM.

However, this architecture creates a high dependency between SETT and LCMM in the processing of status updates. This consumes huge settlement module capacities. In case of high volumes or in case of issue occurring between SETT and LCMM, this may affect SETT performance and cause delays, especially during recycling processes or during the cut-off periods.

> I**nternal messages (Stop sending internal messages SETT/LCMM)**

For each settlement attempt, the Settlement Engine sends a 'T2S internal' message to LCMM to report the instruction status, enabling in particular LCMM to forward it to the end client.

Such internal messages are sent even if there is no change in the status. This results in massive information exchanged with a priori limited value for the participant, as the messages with no status change are filtered by LCMM and are never sent to the clients in A2A mode. In U2A mode, they are only used to refresh the status timestamp on the GUI.

Such internal messages with no status change represent significant volumes and CPU consumption
  - 320 000 daily messages
  - 50% of failure reasons in RTS
  - 34% of failure reasons in NTS
  - 37% of communications from SETT to LCMM
  - Millions of internal IMS messages and DB2 data base updates
  - Up to 140 update messages with no status change can be sent for a single transaction during the day

**Description of requested change:**

> **Improve Optimisation process (Related to Proposal 1.14 in the T2S Stategic Evolution Report)**

The change will consist in separating the cash and securities optimisations by:
- Giving priority to the lack of securities, and
- Triggering cash optimisation in a deferred manner at a pre-defined periodicity (which will be determined during the Detailed Assessment (DA)).

In the context of the new process:
  - T2S will continue to perform the optimisation process immediately if the first settlement attempt is failing;
  - Only if the first optimisation is not successful, the new mechanism of deferred optimisation will apply;
  - Cash recycling will not be impacted and will run as today.

Expected benefits are CPU consumption reduction and higher performance during RTS. This change should be transparent for users and will not affect settlement efficiency as cash optimisation will still run at the agreed periodicity.

> **Updating during RTS (reduce the coupling between SETT and LCMM) (Related to proposal 1.17 in the T2S Strategic Evolution Report)**

The change will consist in modifying the way SETT and LCMM modules interact during RTS for the updates of status and to align RTS with NTS process, by reducing the coupling between both modules.

Under the new architecture, the status update in LCMM will be performed by LCMM based on information received from SETT module and not anymore directly by SETT, relieving the pressure on settlement processing especially during critical and peak activities. Changes required in the design and potential impact on resources at LCMM side will be analysed during the DA.

This change should be transparent for users in terms of implementation effort and functionality, therefore the message sequencing order should be respected to keep the consistency of the T2S actors processing of messages.
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NFT tests will allow to check that there is no impact for customer and in terms of performance when dealing with high volumes.

From a planning standpoint, this change would benefit from the prior implementation of the change described next ("Internal messages"), since it would drastically reduce the workload associated with database updates.

➢ I**nternal messages (Stop sending internal messages SETT/LCMM) (Related to proposal 1.16 in the T2S Stategic Evolution Report)**

The change will consist for the Settlement module to stop informing LCMM when recycling status/failure reason of a transaction remains unchanged.
During RTS, SETT will implement a 'filtering' in real time.
This CR will also impact the NTS phase: during this period, the filtering could be done per sequence.

T2S will still keep:
- one daily reporting at the first settlement attempt of the day, and
- a second reporting at EOD cut-off if it is still in failure.

The expected client impact is that the timestamp on the GUI will not be refreshed when the settlement attempt does not change the status, I.e., the timestamp will remain the one of the first settlement attempt of the day.

Example:

| Bussiness day | Calendar day | Period | Time | Action | Status message A2A | Staus timestamp on the GUI | |
|---|---|---|---|---|---|---|---|
| | | | | | | **Today** | **After CR impl.** |
| D | D-1 | NTS | 21.30 | First Settlement attempt | Yes | 21.30 of BD=D 1st Settlement attempt | 21.30 of BD=D 1st Settlement attempt |
| D | D | RTS | 11.00 | Settlement attempt Failure reason **unchanged** | No | 11:00 of BD=D | Unchanged 21:30 still shown |
| D | D | RTS | 11:15 | Query via GUI of SI status | Not applicable. | 11:15 of BD=D | Unchanged 21:30 still shown |
| D | D | RTS | 13.00 | Settlement attempt Failure reason **changed** | Yes | 13:00 of BD=D (new failure reason) | 13:00 of BD=D (new failure reason) |
| D | D | RTS | 15.00 | Settlement attempt Failure reason **unchanged** | No | 15:00 of BD=D | Unchanged 13:00 still shown |
| D | D | RTS Closure | 16.00 | Settlement attempt Failure reason **changed due to cut-off** | Yes | 16.00 of BD=D (Settlement attempt in RTSC) | 16.00 of BD=D (Settlement attempt in RTSC) |
| D+1 | D | SOD | 19:00 | Query via GUI of SI status | Not applicable. | 16.00 of BD=D (Settlement attempt in RTSC of BD=D) | 16.00 of BD=D (Settlement attempt in RTSC of BD=D) |
| D+1 | D | NTS | 22.00 | First Settlement attempt of the new BD | Yes | 22.00 of BD=D + 1 | 22.00 of BD=D + 1 |

The benefits of this proposal will be to:
- Avoid the sending a significant number of messages by SETT to LCMM;
- Significant capacity savings;
- Harmonise U2A and A2A processes.

**Submitted annexes / related documents:**

**Outcome/Decisions:**

*CRG on 8 January 2025: the CRG agreed to launch the preliminary assessment of CR-0845.

**Documentation to be updated:**

**Preliminary assessment:**

**Detailed assessment:**