



EUROPEAN CENTRAL BANK

EUROSYSTEM

T2S CHANGE REQUEST FORM		
<b>General Information (Origin of Request)</b> <input type="checkbox"/> User Requirements (URD) or GUI Business Functionality Document (BFD) <input checked="" type="checkbox"/> Other User Functional or Technical Documentation (SYS)		
<b>Request raised by:</b> OMG	<b>Institute:</b> 4CB	<b>Date raised:</b> 26/05/2021
<b>Request title:</b> T2S Settlement Optimisation Analysis		<b>Request No.:</b> T2S 0766 SYS
<b>Request type:</b> Common	<b>Classification:</b> Operational /Corrective Maintenance	<b>Urgency:</b> Normal
<b>1. Legal/business importance parameter<sup>1</sup>:</b> Low	<b>2. Market implementation efforts parameter<sup>2</sup>:</b> Low	
<b>3. Operational/Technical risk parameter<sup>3</sup>:</b> Low	<b>4. Financial impact parameter<sup>4</sup>:</b> Medium	
<b>Requestor Category:</b> 4CB	<b>Status:</b> Allocated to a release	

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

Since 2017, 4CB produces the Settlement Optimisation Analysis report quarterly. The aim of the report is to provide observations related to the global settlement fail rate in T2S together with an analysis of the associated background. The global settlement fail rate in T2S is measured for a given period taking into account all operations settled for all actors on the platform – It allows to follow globally the system performance indicator. This conforms to the definition of PSEI (Platform Settlement Efficiency Indicator) introduced in the CSG workshop for market settlement efficiency.

It seems actually that the interest for this report has lowered as the T2S platform is quite stable in terms of settlement efficiency while the production cost of the report on 4CB side is not negligible. Nevertheless, the market has requested to keep a light version of the report with a lower frequency, once a year and upon request should be sufficient.

The aim of this change request is to meet the market expectation by proposing a lighter and pre-formatted report generated in an automated way to reduce production cost on 4CB side. Production frequency could be once a year as well as upon request, for a T2S global view or also per CSD upon a request from a specific CSD.

<sup>1</sup> Legal/business importance parameter was set to Low because the CR relates to a yearly report produced for information only.

<sup>2</sup> Market implementation effort parameter was set to Low because the change does not require a long implementation time and any significant resources on the side of Participating CSDs, CBs and their communities

<sup>3</sup> Operational/technical risk parameter was set to Low because the yearly report being automated does not interfere with day to day T2S operations.

<sup>4</sup> Low < 100kEUR < Low-Medium < 200 kEUR < Medium < 400kEUR < High < 700kEUR < Very high

## Description of requested change:

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### Business Observations

The current Settlement Optimisation Analysis provides observations on the following indicators:

#### EOD/NTS fail rates and traffic trends

- T2S global average per day for EOD/NTS value and volume fail rates per business day/quarter/year
- T2S global average per day for EOD/NTS number/value of transactions submitted to settlement per day quarter/year

#### RTS daily settlement profile

- T2S global average per day for value fail rates each 15 minutes from the end of NTS (0h) to 7 am per quarter
- T2S global average per day for incoming/settled number of transactions each 15 minutes from the end of NTS (0h) to 7 am per quarter
- T2S global average per day for value fail rates each 15 minutes from 7 am to end of day (6 pm) per quarter

#### EOD/NTS unsettled transactions distribution (fails analysis)

- The percentage of the global number/value of unsettled transactions at the EOD/end of NTS per transaction seniority within the system (OLD/NEW/LATE) per quarter
- The percentage of the global number/value of NEW and OLD unsettled transactions at the EOD/end of NTS per reason for failure (SEC/CASH/OTHER) per quarter

#### Impact of useless transactions

- T2S global average per day for NTS value fail rate with “useless transactions” considered as settled per business day

#### NTS/RTS distribution

- The percentage of the global number/value settled during NTS/RTS per quarter/Year

#### Cash usage

- The global average per day of settled value per quarter/year
- The global average per day of cash transfer from T2 to T2S per quarter/year
- The percentage of average cash transfer (LQT) versus average settled value per quarter/year
- The global average per day of amount of NCB/Client intraday credit provided per quarter/year
- The percentage of average NCB/Client intraday credit provided versus average settled value
- The global average per day of amount (LQT + intraday credit) circulating in the platform per quarter/year
- The percentage of average intraday credit provided versus average total amount circulating in T2S per quarter/year

#### Auto-collateralisation usage

- The value ratio settled with cash only (from a DCA that has a configuration set-up for auto-collateralisation) per business day
- The value ratio of failed transactions at EOD due to a lack of cash, while auto-collateralisation is configured, per business day
- The percentage number of DCA configured for auto-collateralisation per business day
- The volume/value ratio settled associated to DCA configured for auto-collateralisation per business day

#### Partial Settlement

- The global and per CSD average percentage of number/value of transactions eligible to partial settlement per quarter/year
- The global and per CSD average percentage of number/value of transactions subject to at least one partial settlement during the business day per quarter/year

#### Partial Release

- The global and per CSD average number/value of transactions subject to at least one partial release during the business day per month

From that basis 4CB proposes to keep the following observations to make the report lighter:

- EOD/NTS fail rates and traffic trends
- EOD/NTS unsettled volume/value distribution (fails analysis)
- Cash usage (Split EOD/NTS)
- Auto-collateralisation usage (Split EOD/NTS)
- Partial settlement

4CB proposes to produce these observations in global and for CSDs requesting them.

During the Preliminary Assessment analysis it is also proposed to add the following indicators (see section Findings below):

- Annual monitoring of the indicator related CR-0739 (number of times the new implemented mechanism to improve the prioritisation of transactions has been deactivated for performance reasons)
- Annual monitoring of the MOM metrics introduced after the T2S incident of the 25<sup>th</sup> of May 2020 in order to measure the market configuration complexity of the settlement problem run by the MOM algorithms during NTS.

The 4CB proposes to produce these two additional indicators in global only (not available at CSD level).

### **Report production process and format**

- Statistics are based on data extracted from STSI through SQL queries using Enterprise Guide. SQL queries are executed manually on a quarterly basis and results (.csv files) are fetched through FTP connection.
- Extracted Data are used to generate figures and graphics through R scripts and Excel macros
- The report, which is a word document today, is updated manually with the appropriate figures, graphics and comments

4CB proposes to automate the following process:

- Automate STSI SQL queries execution and make the fetch of data easier
- Automate the graphics and figures generation with a unique R or Python script
- Automate the report generation in a Word, PDF or Excel format

The layout of this new annual SOA report shall be drafted during the Detailed assessment for validation at the approval of the change request for implementation.

### **Submitted annexes / related documents:**

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### **Outcome/Decisions:**

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\*CRG on 07 July 2021: the CRG agreed to launch the preliminary assessment of CR-766

\*CRG on 09 November 2021: the CRG agreed to recommend CR-766 for authorisation by the T2S Steering Level

\*PMG on 10 November 2021: the PMG agreed to launch the detailed assessment of CR-766 with a view of scoping in Release JUNE.2023

\*CSG on 17 November 2021: the CSG agreed to authorise CR-766

\*NECSG on 17 November 2021: the NECSG agreed to authorise CR-766

\*AMI-SeCo on 19 November 2021: the AMI-SeCo agreed with the CRG recommendation of CR-766 for T2S Steering Level Authorisation

\*MIB on 24 November 2021: the MIB agreed to authorise CR-766

\*CRG on 7 June 2022: the CRG agreed to recommend to the PMG the implementation of CR-766 in January 2023 (out of the scope of a release).

\*OMG on 1 June 2022: the OMG identified no operational impact from the implementation of CR-766 outside the scope of a release.

\*PMG on 17 June 2022: the PMG agreed to recommend the implementation of CR-766 outside the scope of a release.

\*CSG on 23 June 2022: the CSG approved the inclusion of CR-766 outside the scope of a release.

\*NECSG on 23 June 2022: the NECSG approved the inclusion of CR-766 outside the scope of a release.

\*MIB on 30 June 2022: the MIB approved the inclusion of CR-766 outside the scope of a release.

### **Documentation to be updated:**

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## **Preliminary assessment:**

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### **Findings:**

- Financial impact: medium
- Impact on other Eurosystem Services or Projects: no
- Risk analysis: No risks has been identified during the preliminary assessment

As described above in the proposed changes, the current process of the SOA production relies on SQL, R scripts and Excel macros.

The new annual, automated and per CSD (on demand) proposed SOA report will require:

- Modification of the SQL scripts in order to cope with the annual lighter proposed report and to extract the necessary data to report per CSD
- Modification of the R scripts and Excel macros in order to factor data processing and to automate the generation of graphics and dashboards
- Create a new script to automate the generation of the report

It is also proposed through this CR to automate the execution of SAS scripts used to extract data from STSI and facilitate data fetching process.

4CB proposes to include in this report two additional interesting observations related to T2S settlement performance:

- Annual monitoring of the indicator related to CR 739 “Prioritise transactions with an older intended settlement date over newer ones also after ISD+3 of the newer transaction, during RTS”. The reporting of this indicator has been asked by the OMG. It is regarding the number of times the new implemented mechanism in CR 739 to improve the prioritisation of transaction has been deactivated for performance reasons
- Annual monitoring of the Mathematical Optimisation Module (MOM) **metrics** introduced after the T2S incident of the 25<sup>th</sup> of May 2020 in order to measure the market configuration complexity of the settlement problem run by the MOM algorithms during NTS.

#### Some example of MOM metrics:

The maximal number of transactions crediting the same CB

The maximal number of transactions debiting the same CB

The maximal number of transactions debiting and crediting the same CB

The total number of transactions debiting and crediting the same pair of CBs

The total number of transactions debiting and crediting the same pair of SPs

The layout of this new section will be drafted during the Detailed Assessment for validation at the approval of the change request for implementation.

A script need to be developed to generate in an automated way graphics and/or dashboards for this section and insert them in the report.

The calculation of the values of these metrics is based on MOM production data fetched manually on a weekly basis. In order to have a maximum automation of this calculation, 4CB proposes to facilitate the MOM production data fetching process.

Detailed assessment:

EUROSYSTEM ANALYSIS – GENERAL INFORMATION

T2S Specific Components		Common Components	
<b>LCMM</b>			
	Instructions validation		
	Status management		
	Instruction matching		
	Instructions maintenance		
	Penalty Mechanism		
<b>Settlement</b>			
	Standardisation and preparation to settlement		
	Night-time Settlement		
	Daytime Recycling and optimisation		
	Daytime Validation, provisioning & booking		
	Auto-collateralisation		
X	Settlement Optimisation Analysis report		
<b>Liquidity Management</b>			
	Outbound Information Management		
	NCB Business Procedures		
	Liquidity Operations		
<b>T2S Interface (as of June 2022 without Static Data Management, Communication for SDMG, Scheduler, Billing)</b>		<b>Eurosystem Single Market Infrastructure Gateway (from R6.0 June 2022)</b>	
	Communication		Communication
	Outbound Processing		Outbound Processing
	Inbound Processing		Inbound Processing
<b>Static Data Management (until June 2022)</b>		<b>Common Reference Data Management (from R6.0 June 2022)</b>	
	Party data management		Party data management
	Securities data management		Securities data management
	Cash account data management		Cash account data management
	Securities account data management		Securities account data management
	Rules and parameters data management		Rules and parameters data management
<b>Statistics and archive</b>		<b>Statistics and archive</b>	
	Statistical information (until June 2022)		Short term statistical information
	Legal archiving (until June 2022)		Legal archiving (from R6.0)
			Data Warehouse (from R6.0)
<b>Information (until June 2022 containing reference data)</b>		<b>CRDM business interface (from R6.0 June 2022)</b>	
	Report management		Report management
	Query management		Query management
			Communication
			Outbound Processing
			Inbound Processing
<b>Operational Services</b>			
	Data Migration (T2S DMT)		Data Migration (CRDM DMT, from R6.0)
	Scheduling (until June 2022)		Business Day Management (from R6.0)
			Business Day Management business interface (from R6.0)

	Billing (until June 2022)		Billing (from R6.0)
			Billing business interface (from R6.0)
	Operational Monitoring		Operational and Business Monitoring
	MOP Contingency Templates		

<b>Impact on major documentation</b>			
<b>Document</b>	<b>Chapter</b>	<b>Change</b>	
Impacted GFS chapter			
Impacted UDFS chapter			
Additional deliveries for Message Specification (UDFS, MyStandards, MOP contingency templates)			
UHB			
External training materials			
Other impacted documentation (FA Sch. 05, FA Sch. 07)			
Links with other requests			
Links	Reference		Title
<b>OVERVIEW OF THE IMPACT OF THE REQUEST ON THE T2S SYSTEM AND ON THE PROJECT</b>			
<b>Summary of functional, development, infrastructure and migration impacts</b>			
Functional and development changes:			
<ul style="list-style-type: none"> <li>- Redesign of the report layout to make it lighter (removal of some of the current indicator and introduction of 2 new indicators)</li> <li>- Automation of the queries to extract the data with a split of the data by CSD to allow to report on a CSD basis in addition of the provision of a consolidated view</li> <li>- Automation of the report generation requiring the adaptation of the data preparation in order to match the new yearly frequency of the report, the review of the some of the graphs</li> <li>- Review of the workflow from the data extraction to the report generation</li> </ul>			
Main Cost Drivers:			
<ul style="list-style-type: none"> <li>- New report Layout</li> <li>- Adaptations required by the Introduction of new indicators, new queries, automated workflow from data extraction to report generation</li> </ul>			
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<b>Impact on other TARGET Services and projects</b>			
No impact on Target2, TIPS, ECMS and CSLD.			
<b>Summary of project risk</b>			
n.a.			
<b>Security analysis</b>			
No adverse effect has been identified during security assessment.			



18 May 2022

## Cost assessment on Change Requests

<b>T2S-766-SYS – T2S Settlement Optimisation Analysis</b>			
One-off	Assessment costs*		
	- Preliminary	2,000.00	Euro
	- Detailed	10,000.00	Euro
One-off	Development costs	293,345.02	Euro
Annual	Operational costs		
	- Maintenance costs	31,025.25	Euro
	- Running costs	50,388.54	Euro

\*The relevant assessment costs will be charged regardless of whether the CR is implemented (Cf. T2S Framework Agreement, Schedule 7, par. 5.2.3).