General Information (Origin of Request)		
☐ User Requirements (URD) or GUI Business Functionality Document (BFD) ☒ Other User Functional or Technical Documentation (SYS)		
Request raised by: Clearstream	**Institute:** CSD	**Date raised:** 22/03/2018
Request title: During partial settlement windows, recycling should only be triggered after an optimization attempt	**Classification:** Maintenance	**Request ref. no:** T2S-0677-SYS
Request type: Common	**Urgency:** Urgent	
1. Legal/business importance parameter: High	**2. Market implementation efforts parameter:** Low	
3. Operational/Technical risk parameter: Low	**4. Financial impact parameter:** High	
Requestor Category: CSD	**Status:** Implemented	

Reason for change and expected benefits/business motivation:

With current system logic, recycling logic and optimization logic are processed in parallel during partial settlement windows:

- When new resources arrive, unsettled transactions are recycled. This results in another partial settlement attempt.
- At the same time optimization is triggered, trying to find instructions which can settle, if they are attempted as a bundled, optimized set of transactions.
- However, if such an optimized set of transactions contains a recycled transaction, which is already submitted to a settlement attempt, the optimized set will not be sent for a settlement attempt. Moreover, in case this recycled transaction settles partially, then the entire optimized set will be cancelled.

Therefore, in case a partial settlement happens, ongoing optimization attempts are stopped. This applies also to back-to-back situations, or to closed circles. Instead of settlement through the optimization logic, such cases might result in a situation with positions oscillating between both involved parties through a series of partial settlement attempts. An example might illustrate:

- Assume A sells 1500 shares to B, and B sells 1500 shares to A.
- A has initial position of 30 shares, and B has no initial position.

At the start of the partial settlement window, T2S will apply a partial settlement where 30 shares are moved from A to B. When the new resources have arrived at B, this triggers recycling and optimization:

- Since B has now 30 shares, the recycling will apply a partial settlement and move the 30 back to A.
- As a result, the optimization attempt is stopped.
- The new resources that have arrived at A will trigger another recycling and optimization attempt.
- Since A has now 30 shares, the recycling will apply a partial settlement and move the 30 back to B.
- As a result, the optimization attempt is stopped.
- The new resources at B will trigger another attempt, with the same outcome, etc.

As a result, the positions oscillate between A and B in a series of partial settlements until the full quantity is settled. And although the optimization would have been able to resolve the situation, it will never be triggered, as any attempt will be cancelled due to another successful partial settlement attempt.

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Description of requested change:

This recycling logic should be adjusted, to give precedence to the optimization of the unsettled portion of the partially settled transaction.

The recycling process should wait for the optimization result (where technical netting attempts to build a bundled optimized set of transactions).

The next recycling attempt shall be triggered when optimization attempt is done, i.e.

- Immediately in case the optimization algorithm did not identify an optimized set, or
- After a settlement attempt of the optimized set in case the optimization algorithm identified an optimized set.

With this approach, back-to-back and closed circle situation could be resolved without positions oscillating between the accounts of the involved clients.
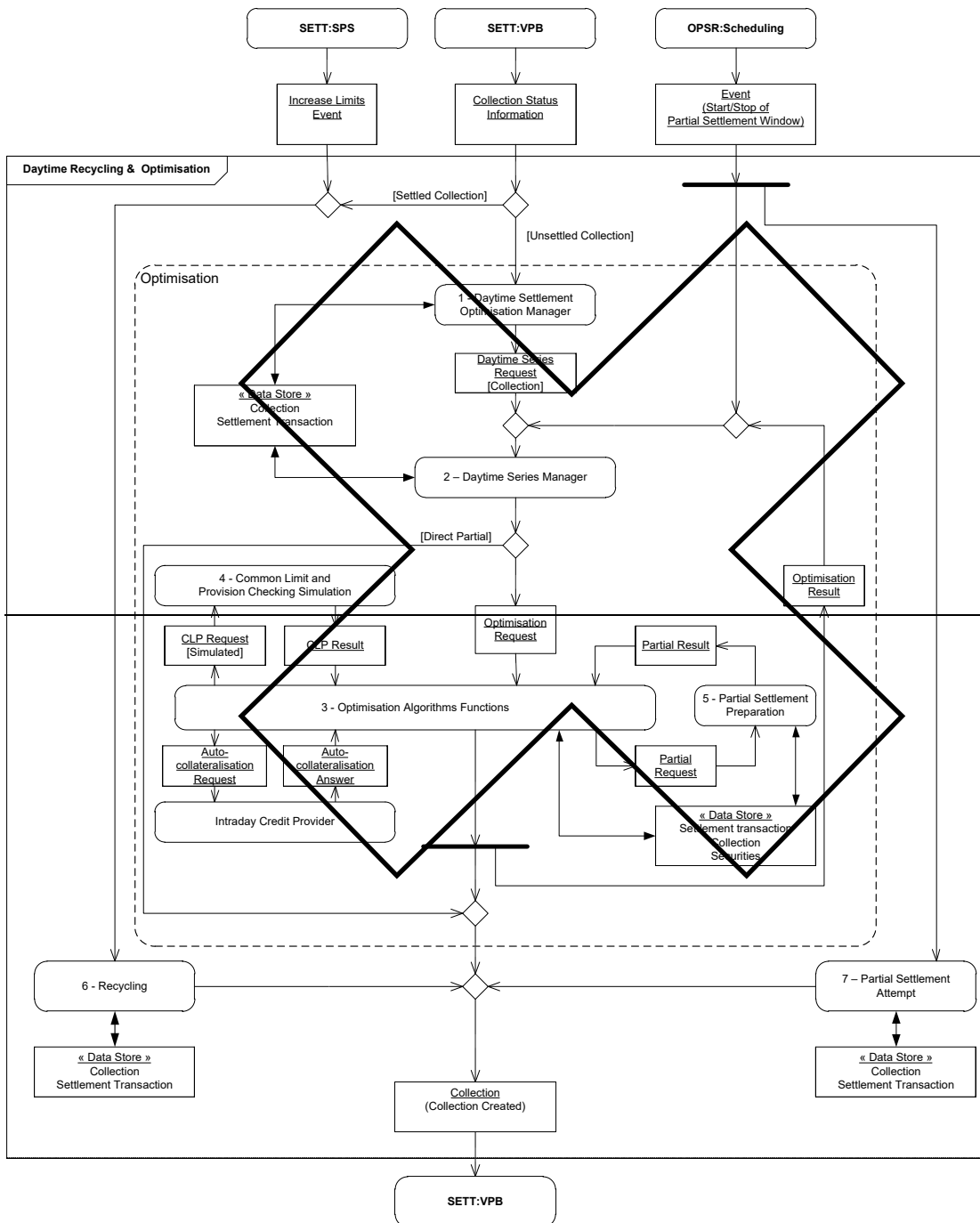
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Submitted annexes / related documents:

http://www.ecb.europa.eu/paym/t2s/progress/pdf/tg/crg/crg121/05.partial_settlement_in_back_to_back_scenarios.pdf
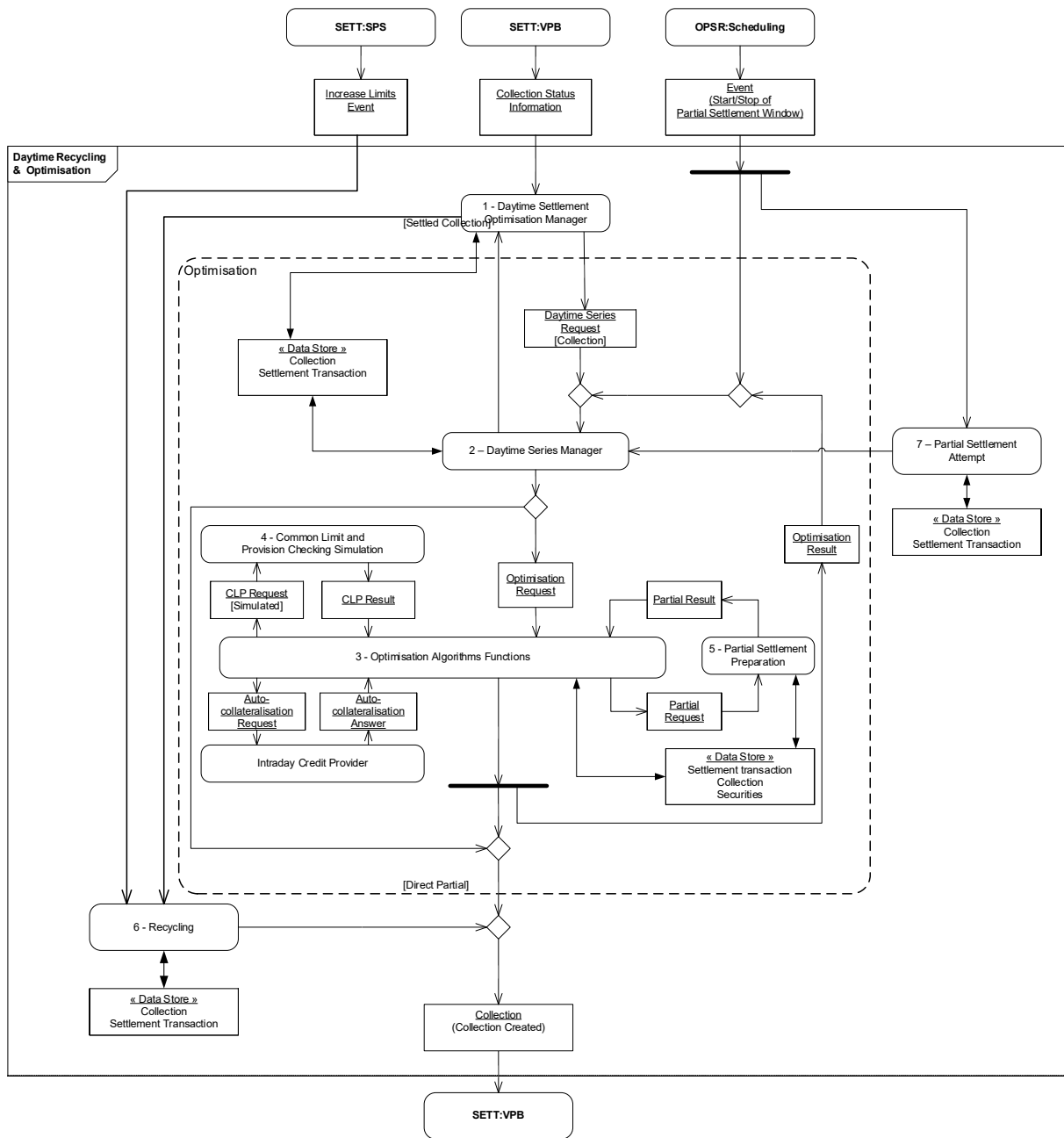
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Proposed wording for the Change request:

The following GFS sections should be modified:

3.5.7 Daytime Recycling and Optimisation

3.5.7.1 Diagram of the module

3.5.7.2 Description of the module

This module runs during the daytime period only. It receives the result of a settlement attempt as a *Collection Status Information.*

When the result consists in a failure, the module triggers the optimisation functions. They combine this new fail with previous ones in order to build a new settlable collection. In such a case, they propose the collection for a new settlement attempt in the *Daytime Validation, Provisioning and Booking module.*

When the result consists in a success, the module triggers the Recycling function except for settled collections with partially settled transactions which are sent to optimisation functions before recycling.

The recycling function ~~It~~ identifies and proposes for a new settlement attempt, in the Daytime Validation, Provisioning and Booking module, Settlement Transactions that have failed during a previous settlement attempt and could profit from the new resources (cash, securities for delivery, securities in positions earmarked available for collateral) **{T2S.07.090} {T2S.08.080}**.

~~*Optimisation*~~

~~The Optimisation functions aim at identifying and submitting to a new settlement attempt, with an expected success, new collections of *Settlement Transactions* that have previously failed to settle.~~

The *Daytime Settlement Optimisation Manager* function (function 1):

l   Sends the settled collections without any partial settlement to Recycling function.

l   Separates the Settlement Transactions ~~of the incoming collection~~ that have previously failed to settle including partially settled transactions into as many collections as needed. For instance, if the collection contains two independent - from a Settlement Transaction LinkSet perspective - settlement transactions, the output is two collections; if the incoming collection contains two Settlement Transactions that are in a "with" relation, the output is one collection. The Daytime Settlement Optimisation Manager function then sends Daytime Series Request, consisting in each of those collections, to the Daytime Series Manager function (function 2) for optimisation.

Optimisation

The Optimisation functions aim at identifying and submitting to a new settlement attempt, with an expected success, new collections of *Settlement Transactions* that have previously failed to settle.

The *Daytime Series Manager* function (function 2) launches, for each *Daytime Series Request*, a succession of *Optimisation Algorithm Functions* - referred to as a series - on the collection received.

Partial Settlement Attempt

At the reception of an *Event (Start of Partial Settlement Window),* the *Partial Settlement Attempt* function (function 7) aims at submitting to partial settlement all *Settlement Transactions* eligible to partial settlement (as identified upfront by the *Standardisation and Preparation to Settlement* module) that could not settle in an earlier attempt due to a lack of securities. It sends them to the ~~*Daytime Validation, Provisioning and Booking* module on a one by one basis~~ Daytime Series Manager function complying with the priorities defined in SETT.R&O.OAF.2.1 **{T2S.08.050} {T2S.08.190}**.

3.5.7.3 Description of the functions of the module

1 – Daytime Settlement Optimisation Manager

Reference Id	*SETT.R&O.DSO.1.1*

The *Daytime Settlement Optimisation Manager* function receives a *Collection Status Information* related to a~~n~~ ~~newly~~ unsettled collection, and:

l   Cancels the collection received;

l Ignores all *Settlement Transactions* that require the settlement of at least one *Settlement Transactions* before it can be settled (for instance, a *Settlement Transaction* that is "after" in a *Settlement Transaction LinkSet* for which one of its "before" *Settlement Transaction* is unsettled) **{T2S.09.110} {T2S.09.100}**;

l Regroups the others into as many collections as necessary with respect of their "with" link;

l Sends, for each of those newly created collections, a *Daytime Series Request* to the *Daytime Series Manager* function for optimisation with the collection as a parameter **{T2S.08.050}**.

Reference Id	SETT.R&O.DSO.1.2

The *Daytime Settlement Optimisation Manager* function receives a *Collection Status Information* related to a settled collection, and:

l Sends the settled collections without any partial settlement to Recycling function;

l Includes each partially settled transaction into as many collections as necessary;

l Sends, for each of those newly created collections, a *Daytime Series Request* to the *Daytime Series Manager* function for optimisation with the collection as a parameter **{T2S.08.050}**;

l Waits for the result of all the optimisation attempts before sending the initial settled collection to the Recycling function.

6 – Recycling

Settled collection

Reference Id	*SETT.R&O.REC.1.1*

When the *Recycling* function receives a *Collection Status Information* from the ~~Daytime Validation, Provisioning and Booking~~ module Daytime Settlement Optimisation Manager function related to a newly settled collection:

l It cancels the collection received;

l It selects the following settlement transactions:

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7 – Partial Settlement Attempt

Reference Id	*SETT.R&O.PSA.1.1*

The *Partial Settlement Attempt* function receives an *Event (Start of Partial Settlement Window)* from the *Scheduling* module **{T2S.08.220} {T2S.11.735} {T2S.03.165}** and:

l Selects all *Settlement Transactions* eligible to partial settlement which have failed in a previous settlement attempt due to lack of securities **{T2S.08.210}**;

I Creates as many collections as *Settlement Transactions* selected (each *Settlement Transaction* has its own collection or the *Settlement Transactions* with T2S generated links are grouped in a same collection) and sends those collections for settlement to the ~~*Daytime Validation, Provisioning and Booking* module~~ Daytime Series Manager function, complying with the priorities defined in SETT.R&O.OAF.2.1 **{T2S.08.050} {T2S.08.190}.**

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High level description of Impact:

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Outcome/Decisions:

* CRG written procedure ended 20 April 2018: The CRG agreed to launch the preliminary assessment of the CR.

* CRG on 4 July 2018: The CRG recommended that the T2S Steering Level authorises the CR

* AMI-SeCo written procedure ended 22 August 2018: The AMI-SeCo agreed to the recommendation of the CRG

* CSG written procedure ended 23 August 2018: The CSG took a resolution to authorise the ranking of the CR and its allocation to a T2S release

* MIB on the 12 September 2018: The MIB has approved for ranking this Change Request.

* CRG on the 21 May 2019: The CRG recommends to the PMG the inclusion of this Change Request in R4.0.

* OMG on the 22 May 2019: The OMG concluded that this Change Request has no operational impact.

* PMG on the 24 May 2019: The PMG recommends the inclusion of this Change Request in R4.0 for approval by the Steering Level.

* CSG on 13 June 2019: The CSG agreed to approve the STP for R4.0 including CR-677.

* NECSG on 14 June 2019: The NECSG agreed to approve the STP for R4.0 including CR-677.

* MIB on the 18 June 2019: The MIB agreed to approve the STP for R4.0 including CR-677.

Preliminary assessment:

- **Impact:** Low-medium
- **Impacted modules/functionalities:** SETT
- **Findings:** No special findings can be reported beyond the elements described in the CR.

- **Open issues/ questions to be clarified by the originator:** No additional questions have been identified.

EUROSYSTEM ANALYSIS – GENERAL INFORMATION				

		Static data management		Interface
Impact On T2S		**Static data management**		**Interface**
		Party data management		Communication
		Securities data management		Outbound processing
		T2S Dedicated Cash account data management		Inbound processing
		Securities account data management		
		Rules and parameters data management		
		Settlement		**Liquidity management**
		Standardisation and preparation to settlement		Outbound Information Management
		Night-time Settlement		NCB Business Procedures
	X	Daytime Recycling and optimisation		Liquidity Operations
	X	Daytime Validation, provisioning & booking		**LCMM**
		Auto-collateralisation		Instructions validation
				Status management
		Operational services		Instruction matching
		Data Migration		Instructions maintenance
		Scheduling		**Statistics, queries reports and archive**
		Billing		Report management
		Operational monitoring		Query management
				Statistical information
				Legal archiving
		All modules (Infrastructure request)		
		No modules (infrastructure request)		
		Business operational activities		
		Technical operational activities		

Impact on major documentation		
Document	**Chapter**	**Change**
Impacted GFS chapter	3.5.7 Daytime Recycling and Optimisation	Update of diagram of the module Enhancement of DSO description to give precedence to the optimisation of the unsettled portion of partially settled transactions
Impacted UDFS chapter	-	-
Additional deliveries for Message Specification	-	-
UHB	-	-
Other documentations	-	-
Links with other requests		
Links	Reference	Title

OVERVIEW OF THE IMPACT OF THE REQUEST ON THE T2S SYSTEM AND ON THE PROJECT		

Summary of functional, development, infrastructure and migration impacts

The T2S recycling logic will be changed to give precedence to the optimisation of the unsettled portion of the partially settled transaction. This would avoid unnecessary numerous partial settlements.

For settled collections with partially settled transactions, the Daytime Recycling and Optimisation module will send such collections to optimisation functions before recycling.

This requires an adjustment to the Daytime Settlement Optimisation Manager and to the T2S behaviour at opening of a partial settlement window.

Main Cost drivers:

- During RTS partial window, the module Recycling and Optimisation (R&O) should be adjusted to give precedence to the optimization of the unsettled portion of partially settled transactions.
- New behaviour within Daytime Settlement Optimisation Manager (DSO) required.
- New behaviour is also required at the opening of a Partial Settlement Window.

Summary of project risk
None.

Security analysis
No adverse effect has been identified.

15 April 2019

Cost assessment on Change Requests

T2S-677-SYS – During partial settlement windows, recycling should only be triggered after an optimization attempt			
One-off	Assessment costs* - Preliminary - Detailed	2,000.00 10,000.00	Euro Euro
One-off	Development costs	430,132.91	Euro
Annual	Operational costs - Maintenance costs - Running costs	 40,706.80 0.00	 Euro 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).