

Clearstream Complete ICSD settlement solutions



Reaching across the globe

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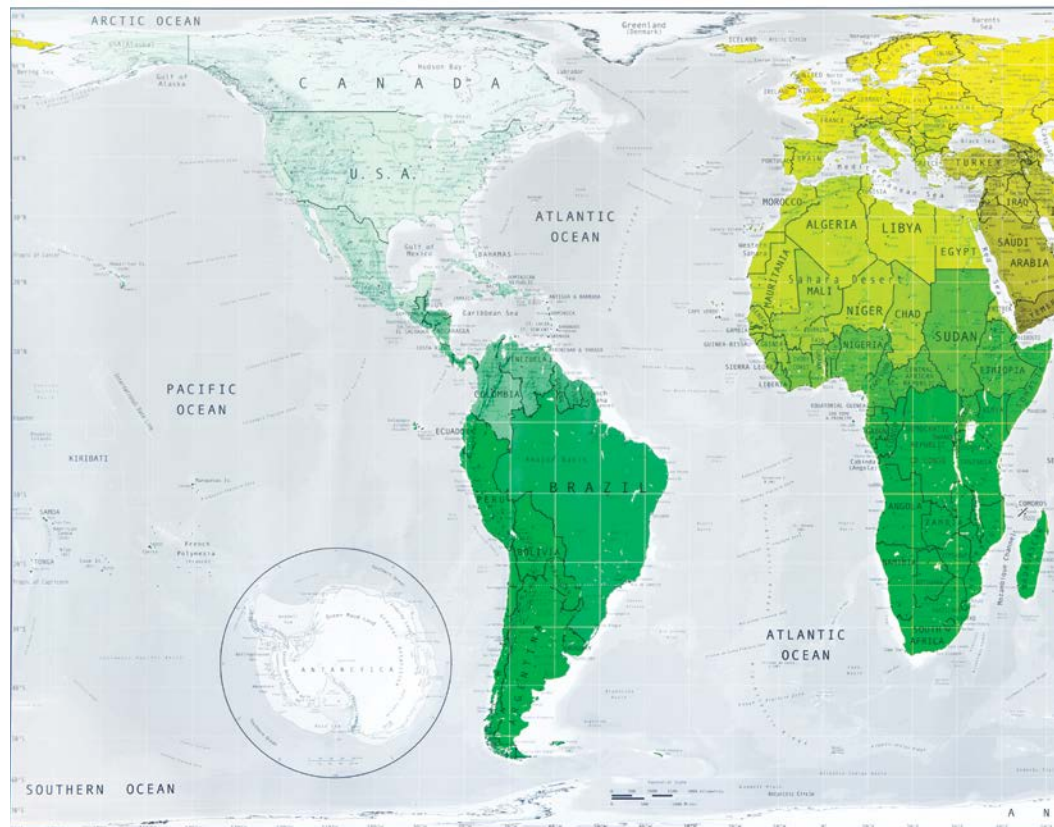
Clearstream's structure as both an international central securities depository (ICSD) and the largest central securities depository (CSD) in Europe gives our customers the best of all worlds: the choice of central bank or commercial bank money settlement as well as a wide range of post-trade services, including asset servicing, global securities financing and investment funds services. All delivered via a single point of access.

Our cutting-edge settlement platform is the most efficient in the world, allowing our customers to enjoy full flexibility in their choice of products and services. We offer more settlement solutions than any of our competitors, each designed to maximise settlement opportunities while minimising outlay.

All Clearstream and LuxCSD* customers enjoy easy access to the largest ICSD settlement network and can carry out transactions across multiple asset classes and currencies in our 55 domestic markets (plus the international securities market)** around the world.

We continue to work actively on extending and improving our access to domestic markets. We have recently added Georgia to our extensive network of domestic links and will continue to open new links in the coming year, as detailed below.

Europe: We continue to improve our presence in Eastern Europe, we plan to offer a link to Armenia in July 2016. The access to some markets will be enhanced to direct link and additional instrument types will be offered.



* LuxCSD – joint owned with Banque centrale du Luxembourg.
 ** A current list of these markets can be found at the back of the brochure.

Preparing for T2S migration

Clearstream is firmly on track for T2S migration.

Since the conception of TARGET2-Securities (T2S), Clearstream has been actively contributing to the future shape of this pan-European settlement platform. Clearstream Banking Frankfurt and LuxCSD were amongst the first CSDs to sign the Framework Agreement – thereby cementing our commitment to join the infrastructure. And, as the largest and most international participating CSD in T2S we are ideally positioned to pass the potential T2S offers through to our customers.

So what does this mean to you?

The first wave of T2S went live in June 2015 and over the next two years the remaining T2S markets will migrate in a phased approach. Access to European markets will change intrinsically as they go live on the new T2S platform. To ensure the burden on our customers is minimal we have invested heavily in adapting our links. Our ICSD will link to T2S via a single point of access: our German CSD. By operating in such a lean structure, we have the ability to keep infrastructure and settlement costs to a minimum and have already committed to passing these benefits on to our customers.



We will also be in a better position to offer harmonised services across the various T2S markets and the ICSD.

Additionally, operating both ICSD and Investor CSD models, Clearstream is able to provide customers with the choice to either keep settlement in commercial bank money or switch to settling in central bank money. Another important benefit for all our customers is that we will treat European domestic and international assets as a single liquidity pool. Collateral can be seamlessly transferred at any time between T2S Investor CSD accounts and ICSD accounts.

Our ICSD is already linked to all the markets signed to join T2S, and we will support continued access to those European counterparties during any transition and migration of the market CSDs to T2S. For our customers, this is achieved without doing anything beyond what may be required to comply with market-specific adaptations. As the markets ready themselves for T2S, we will communicate any necessary adaptations as soon as the domestic market informs us.

From the moment migration starts to final implementation, our customers can continue to use our services as they know them. There will be no limitations, no degradation of the system. In fact, customers will enjoy:



- **Same market reach** – 55 markets globally (Europe, Asia, Middle East, the Americas, etc.) and the international market (Eurobonds).
- **Same asset classes** – bonds, equities, investment funds, etc.
- **Same counterparty reach** – 2,500 Clearstream customers plus all other counterparties available via the Bridge and on domestic markets.
- **Same money quality** with choice of central bank money or commercial bank money.
- **Same added-value services** – cash and securities financing, asset servicing, tax, collateral management, investment funds services.
- **State-of-the-art connectivity capabilities** – fully-optimal, real-time connectivity performed by our CreationConnect suite and our new portal ClearstreamXact.
- **Improved turnaround time** of T2S domestic market instructions.
- **Harmonised cut off times and settlement periods** of domestic instructions.

Clearstream's German CSD will be the largest participant in T2S; accounting for around 40 per cent of total Eurozone volumes on the settlement platform. By coupling this advantageous position with our global ICSD business model, the Bridge interface and the ability to settle in commercial bank money, we will be able to offer our customers the best possible value proposition; a growing liquidity pool.

Combined with our highly-sophisticated collateral management engine, the Global Liquidity Hub; top quality close-to-market asset servicing and innovative investment funds services, Clearstream's solutions give our customers the flexibility to choose from the widest range of settlement and value-added services in both our ICSD and CSD worlds. In fact, our ambition to become a one-stop shop will be realised.

Exceptional, fully-optimised settlement solutions



No ifs and buts just highly sophisticated, extremely fast settlement solutions.

Fully-optimised, real-time settlement is particularly important in today's environment where a premium is placed on rapid settlement and maximum liquidity; most especially in the collateral management arena where the key is in delivering a seamless mobility of cash and securities.

Our settlement infrastructure has long been capable of handling enormous trade volumes by straight-through processing. Essentially, it means that during each and every settlement process our engine maximises the number of instructions that can be settled while minimising the amount of time, credit and collateral required in order to complete the settlement of all those instructions.

What real-time means to us

To us "real-time" is simple and straightforward. On average, instructions are processed in less than 20 seconds of receipt. This happens continuously throughout the entire settlement day – roughly 4,000 times per day. Therefore, if an instruction is not able to be settled (e.g. lack of provision from the counterparty) it will be recycled continuously in real-time until settlement takes place.

At Clearstream, real-time means what it says.

Efficiency through netting algorithms

Due to the power of our systems there are no restrictions to our settlement processing: we never stop settlement to perform fails lending and never, at any time, limit the number or complexity of the settlement optimisation algorithms we run during the day.

The netting algorithms employed by our settlement engine will address all possible netting combinations during each and every process. Depending on the number of instructions and counterparties settling at any point in time these range from the most basic, linear back-to-back settlement links to the most complex relationships between multiple customers with multilateral deliveries and receipts.

And multiple netting algorithms of differing complexity can be run in parallel for mutually exclusive sets of settlement transactions at any time.

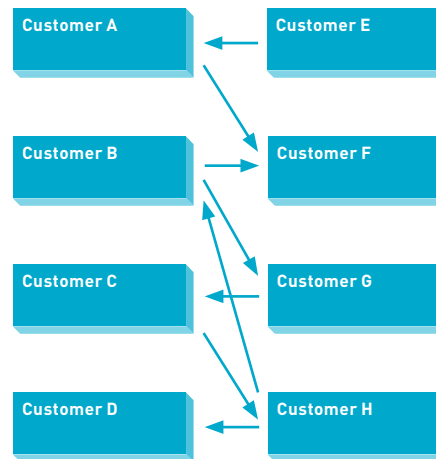
There are no limits to the number, complexity or frequency with which netting algorithms can be performed. They are performed during each of the thousands of settlement cycles we run throughout the day.

Examples of netting algorithms

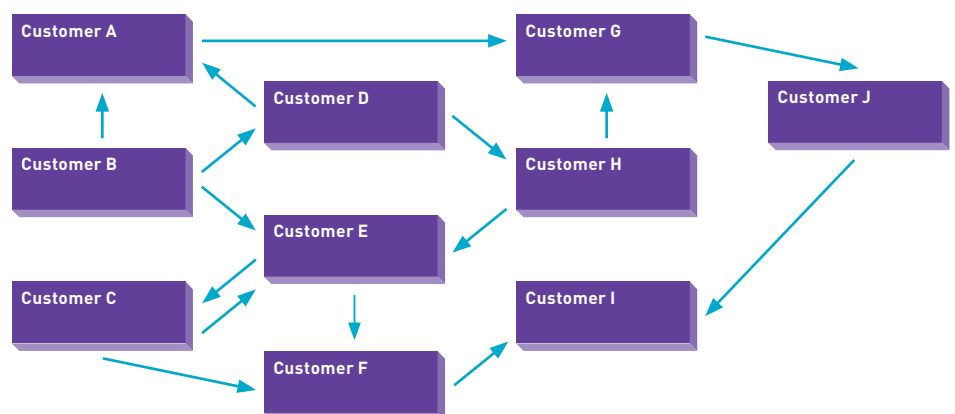
Linear back-to-back



Many-to-many



Complex multilateral



→ Arrows represent DVP or FOP movement

Clearstream's settlement day

Customers enjoy long real-time processing times beginning at 21.30 SD-1 (the evening of the business day preceding settlement date). Real-time settlement processing runs continuously until 20.05 SD, with end-of-day processing scheduled to be completed by 20.35 SD. This coverage provides customers with very competitive cash and securities deadlines in all markets, and subsequently facilitates the free flow of collateral. During this time, instruction pre-matching and settlement reporting and querying run continuously.

During real-time processing, the settlement day is split into two periods for both internal and Bridge instructions:

Mandatory settlement period begins at the start of night-time processing – in the evening of the business day preceding the settlement date –

and continues into the afternoon on settlement day. During this time a delivery may only be refused for reason of cash or credit provision.

Optional settlement period (for against payment transactions) follows the mandatory period. Providing customers have marked their instructions eligible for the optional settlement period (by using an Optional Settlement Flag), all instructions unsettled at the end of the mandatory settlement period and any new or amended instructions received in time are processed in the optional settlement period.

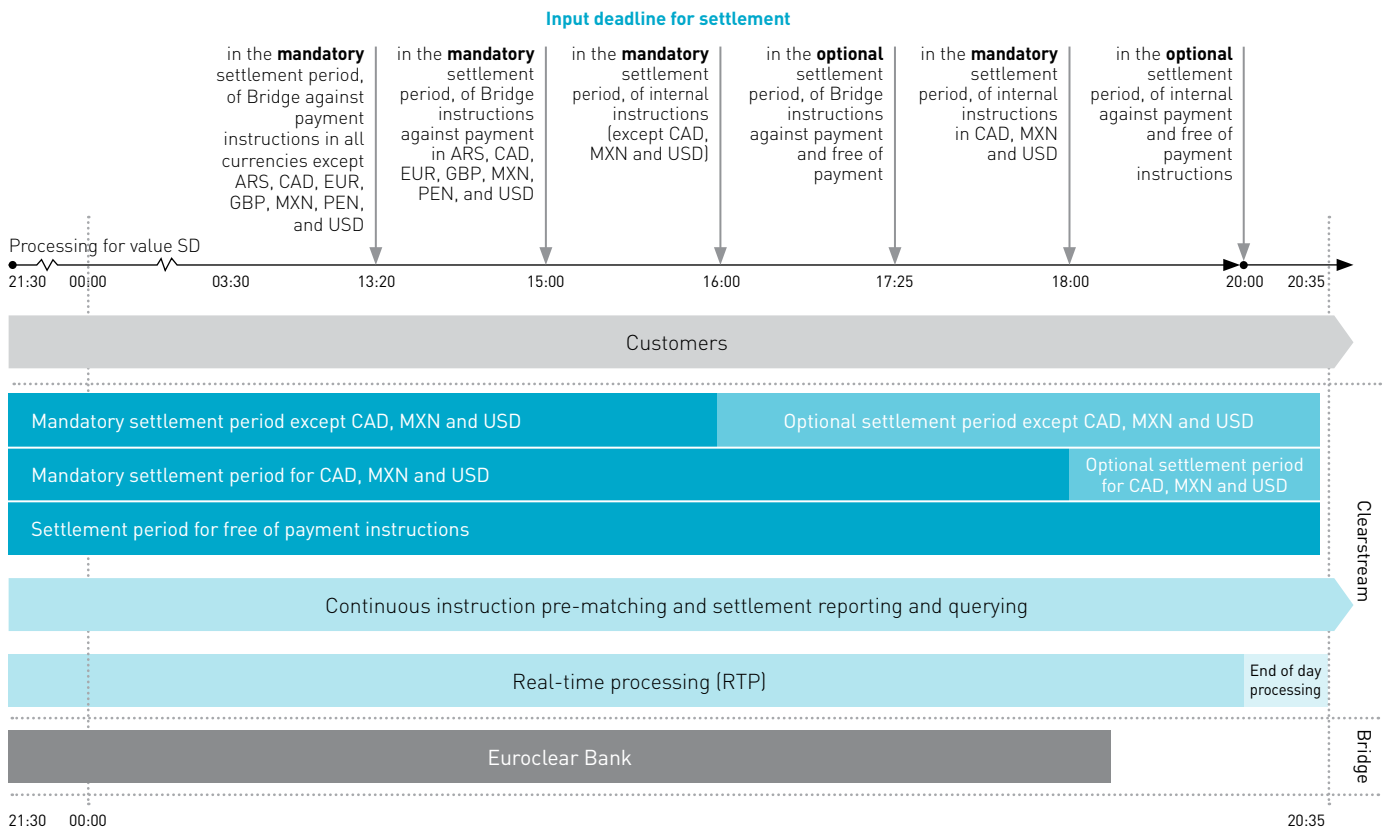
In 2015, we improved both our internal and Bridge deadlines significantly and removed the concept of optional period for free of payment transactions. However, being the ICSD with the best deadlines for internal transactions is not enough and we will continue to

improve our end-of-day deadlines in order to be even more attractive for our global customer base.

Deadlines set in local market time throughout the globe

We have no daylight saving constraints on our settlement deadlines, meaning you can benefit from up to two hours additional settlement depending on the market and your time zone. For example, if the local time deadline in Australia is 17:30 and you are sitting in London, you benefit from a two-hour increase on the deadline between April and October.

There's no need to convert local market time to your instruction deadline – you can forget about clocks going forward or back and think about one time zone (the local one) throughout the entire year.



The Bridge



After the successful implementation of phase 1, our efforts are now concentrated on phase 2.

The Bridge is the electronic communication platform that facilitates the efficient settlement of securities transactions between customers of Clearstream and their counterparties in Euroclear Bank.

It is the most active securities link in the world, with securities worth around 100 billion EUR settled daily, and one of the best examples of seamless interoperability between two competing infrastructure providers. Transactions for Bridge settlement can be executed both free of payment (transfer of

securities between two counterparties) or against payment (simultaneous exchange of cash versus securities between two counterparties).

Thirty-five times a day, during both the mandatory and optional settlement periods, delivery and feedback files are exchanged between the two ICSDs. Pre-matching transmissions take place 33 times in-between the exchanges, ensuring optimal settlement opportunities.

Improvements to the Bridge

The Bridge is currently going through a number of phased improvements. Phase 1 of the project was successfully implemented on 28 September 2015, when the ICSDs moved the Bridge into a currency-driven model.

The key features of phase 1:

- Additional matching and settlement files
- Reduce settlement turnaround time
- Significant improvement in input deadlines, in particular for core currencies (EUR, GBP, USD) to 15:00
- Move to mandatory settlement only for free of payment transactions (customer deadline 17:25)
- Extension of interoperability between the ICSDs at the end of the day until 18:30 CET.

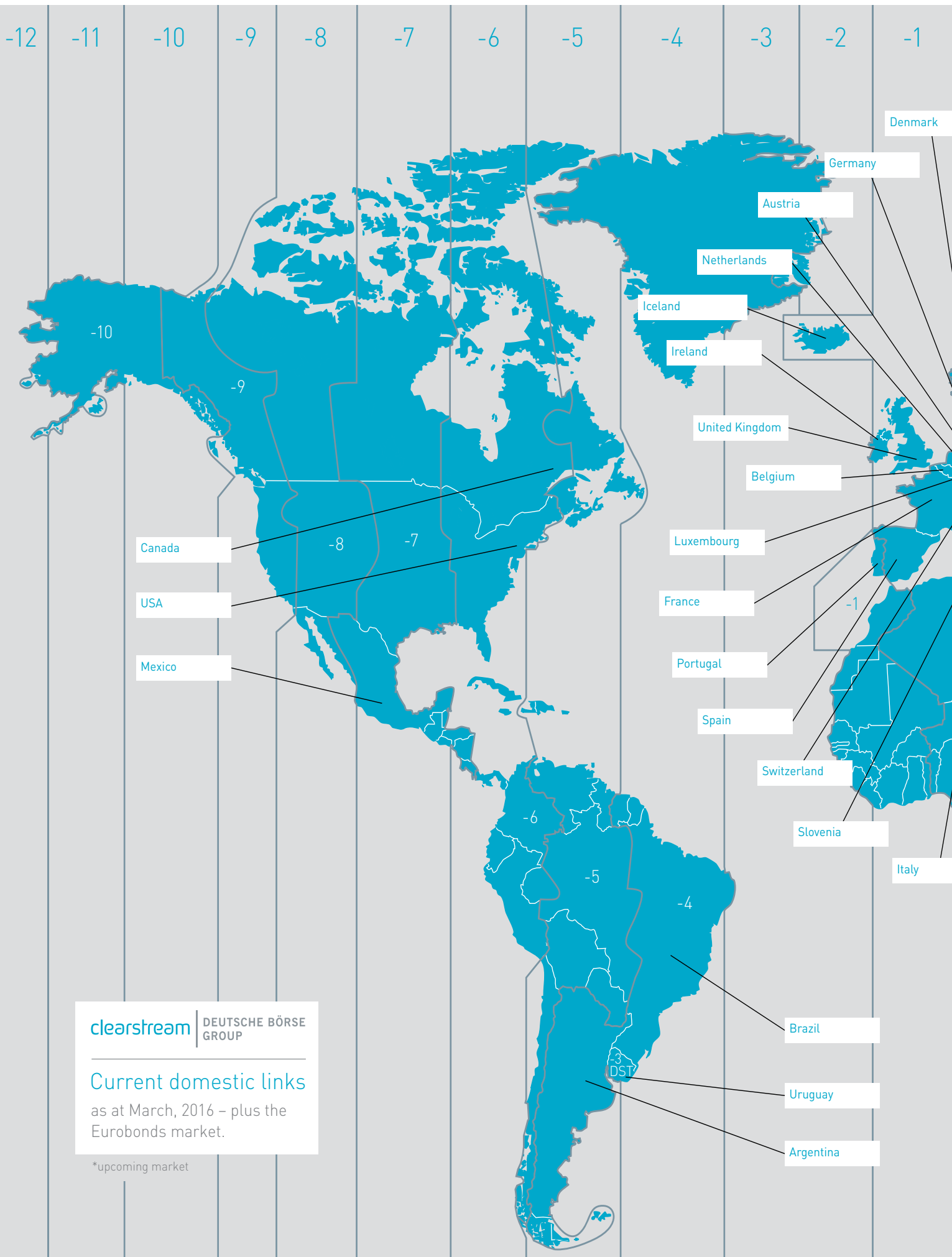
A second implementation phase has been agreed, which will bring:

- Faster matching process (at least every 2 minutes)
- Implementation of new matching fields (second layer participant matching)
- Faster settlement file exchanges (files will be exchanged between ICSDs at least every 10 minutes) allowing for a settlement turnaround between 10 - 40 minutes
- Further improvement of customer's input deadlines.

After the completion of the migration to T2S, both ICSDs will look at the possibility to move to a real-time Bridge environment.

Bridge settlement turnaround evolution

Bridge 2014	Bridge phase 1 (2015)	Bridge phase 2 (ongoing)
60' - 120'	35' - 90'	10' - 40'



clearstream | DEUTSCHE BÖRSE GROUP

Current domestic links
as at March, 2016 - plus the
Eurobonds market.

*upcoming market



Comprehensive suite of matching services

Clearstream understands better than anyone the need to have accurate, timely pre-matching/matching information, which is why we always

excel at providing the best services for status updates of your transactions. As well as standard matching services, we offer several special

services that greatly facilitate your transaction matching. In particular, a wide range of pre-matching services that will ease your external settlement.

Matching services

Second layer participant matching

Improve the matching efficiency of your transactions

In order to improve the matching process for customers on internal and external Clearstream transactions, customers can include the details of their second layer participant such as DECU/RECU or BUYR/SELL, or if they wish, include the common reference. As these are optional fields, matching will only be performed on the second layer information if details are provided by both parties.

Benefits include:

- Possibility of cross-matching reduced by adding additional matching details to the transactions
- Optional service, jointly agreed by both parties, increases matching efficiency.

Selective acceptance service

Control the securities received on your account

The selective acceptance service ensures that counterparties cannot unilaterally deliver securities on your account without matching. You can decide to automatically reject these deliveries, giving you full control of what can and cannot be received on your account.

Benefits include:

- Better control of your settlement activity
- Avoid counterparties unilaterally delivering securities against your account.

Single matching account

Greatly decrease settlement risk and simplify internal account management

This simple, yet innovative service improves the process of matching instructions and reduces the number of matching failures for customers with multiple accounts and sub-accounts.

Your counterparty uses only one of your accounts for all their matching instructions with you, while you can choose how to organise your asset holdings without any impact to your counterparty. The securities instruction alone determines which account will be the source, or destination, of the securities.

Once the single matching account has been set up your instructions are automatically matched with those of your counterparties, ensuring settlement takes place in the account of your choice.

Using a single matching account enables customers to:

- Simplify the matching process for the customer's back office and counterparties
- Reduce the risk of matching errors with resulting increased settlement efficiency
- Restructure multiple accounts with no impact on counterparties
- More easily segregate assets
- Monitor counterparties' instructions via one designated account number
- Work with existing instruction or report setups.



Pre-matching services for external instructions

Immediate release flag service

Manage the timing of your instructions release

Clearstream offers the possibility to release its external settlement instructions to the domestic market as soon as the trade has been instructed; i.e. the instruction will be provisioned and sent to the local market immediately. This service is available without subscription and can be used by mentioning CEDE/IREL in the 22F field of your instruction.

Benefits include:

- Quicker feedback from the domestic market against external transactions.

Instructions pre-matching

Benefit from pre-matching messages

Specific markets do not need to use the immediate release flag. Clearstream sends your instruction for pre-matching purposes only (irrespective of the formal provisioning period and without provision check) and then for settlement (after the start of the formal provisioning period and on successful provisioning).

Pre-matching feedback is reported to customers as soon as information is available from the depository. For information on the markets that offer this service, please check the Creation Link guide on www.clearstream.com.

Benefits include:

- Quicker feedback from the domestic market without any provision check.

Matching BIC service (New)

In order to reduce the cross-matching possibilities on your external instructions and help prepare for T2S we have introduced a new concept of matching BIC.

All your transactions are automatically populated with the matching BIC defined on your account, either in the buyer field (for receipt instructions) or the seller field (for delivery instructions), provided the buyer/seller field has not already been populated on your settlement instruction.

Benefits include:

- Significant reduction of cross-matching possibilities, especially on T2S markets.

Domestic allevation matching service

Automatic reporting of domestic allevation against your account or BIC

Where supported by the local market, and as a complement to the pre-matching services described previously, we receive allevations from your domestic counterparties via our local market depositories.

Upon receipt of every allevation message, our best-match algorithm tool automatically searches and finds your best matching instruction.

Benefits include:

- Automatic reporting of the allevations against your account or BIC
- Automatic update on the status of your best matching instruction.



Services for settlement sequence management

Our flexible settlement sequence management services allow you to simplify and control your transaction flows according to business needs. Safe and efficient, they are designed to ease your operational burden and reduce the risks of relying on in-house transaction management. All these services are fully integrated into CreationConnect and are ISO 15022 compliant. Better still they are all free-of-charge to our customers. Choose from three different models:

Domestic back-to-back service

Optimal same-day turnaround of domestic transactions

With this service you can use your domestic transactions to access back-to-back settlement services in many domestic markets. You can use the POOL-ID to link and settle a domestic purchase and a domestic sale on a one-to-one basis, providing it has the same value date and underlying security.

Benefits include:

- Access to domestic back-to-back settlement on numerous markets
- Optimal same-day turnaround
- Use your domestic securities purchase to provision the sale, optimising use of securities and purchasing power for same-day trading.

Transaction linking

Controlled settlement of any combination or number of instructions

This advanced, fully-automated service prevents drawing on omnibus securities positions when executing deliveries. It also allows securities purchases to be made contingent on deliveries, helping control the liquidity

extended to underlying customers. Any combination of instructions, in any number or type, can be used and the service supports purchases reliant on deliveries or vice versa.

Benefits include:

- Early matching of “held” instructions and automatic release
- Total flexibility to link any number or combination of transactions (internal to Bridge, domestic to internal, etc.) regardless of their terms or means of settlement
- No restriction on settlement currencies, underlying security codes and/or counterparts
- Full automation to help eliminate delays and operational risks.

Hold/release service

Easy control of individual transaction settlement

This service allows you to input an instruction and place it on hold, ready to manually release when you need. This is particularly beneficial as the instruction is pre-matched, meaning your counterparty can see the instruction is already prepared and ready for them, but you have full control over the individual settlement



process. You can also decide at any time to put on hold pre-entered but pending instructions.

Benefits include:

- Hold and release settlement transactions at your own discretion
- Match results early without any risk of unintended settlement
- Release held transactions by simply resetting the hold flag and without having to reinstruct
- Supports the use of MT530 Transaction Processing Command.

Transaction priority defined at transaction or account level

Managing the settlement sequence of transactions

This service gives you the possibility to prioritise your instructions depending on your needs.

The priority code gives one transaction priority over other instructions ready for settlement, providing they are on the same account and in the same security or currency. Customers can decide to change the priority of a specific instruction at any time. Customers can also specify the settlement sequence option at account level and change it whenever they wish, if required.

Benefits include:

- Prioritisation of both deliveries (to control settlement in a specified security code) and receipts (to control the use of funds)
- Possibility to add a priority to pending transactions via MT530
- Define the order in which transactions are considered for provisioning and settlement via the settlement sequence options on the account.

Fails management services



The management of pending transactions is facilitated by the following services:

Bilateral cancellation (New)

Our bilateral cancellation service for matched settlement transactions (internal settlement only) has been on offer since September 2015.

Once you and your counterparty have sent their cancellation messages, the instructions are immediately cancelled and reported accordingly. However, the cancellation of unmatched transactions stays unilateral.

Benefits include:

- Harmonises the cancellation process with new T2S standard (foreseen to also be included in the CSD-R regulation)
- Cancellation of matched transactions must be agreed by both counterparties.

Automatic recycling of instructions

In the event that instructions have not been settled or cancelled by end-of-day on the intended settlement date, Clearstream will represent and recycle such unsettled instructions as soon as the next settlement day opens.

For instructions which have been pending for 45 days after the requested settlement date, Clearstream will send you a request to either cancel the automatic recycling of the unsettled instruction or to confirm continuation of recycling.

If no decision is provided, the unsettled instruction will be recycled for a further 15 calendar days, after which the instruction will be automatically cancelled. If confirmation is received from your side, the 60 calendar-day period (that is, 45 plus 15) starts over again.

Benefits include:

- No need for customer to reinstruct
- Reporting to customers of their pending instructions after 45 days
- Cleaning of your pending instructions after 60 days if no action has been taken on your side.

Recycling of instructions when a security code is not open

The instruction recycling service improves the handling of settlement instructions when the instruction relates to a security code that was not opened by Clearstream.

By subscribing to the service, you will, when sending a settlement instruction in a security code not yet open in Clearstream, avoid automatic cancellation at the end of the period while the eligibility of the security code in Clearstream is being investigated.

The settlement instruction will be recycled during a period starting on and including the day of receipt of the instruction up to the customer's requested settlement date (RSD) or for at least four business days, whichever is longer.

Benefits include:

- Preventing your transaction, for a certain period, from being automatically cancelled while the security code is being investigated.

Umbrella credit and collateral services

Reduce the cost of credit lines and collateral management.

Expand the flexibility and efficiency of your credit and collateral by using an umbrella account structure. This account structure groups a set of accounts together in order to share a single credit line and/or to pool collateral.

Once you have chosen the accounts to be placed under the umbrella structure, the collateral held in the pledge accounts can be pooled and made available for credit lines for any account held within the umbrella structure, including client accounts and fund accounts. Monitoring of both the credit line throughout the participating

accounts and the available collateral is fully automated and can be checked online at any time.

When you set up an umbrella account, you have full control to decide how each account is used, i.e. whether or not it is part of the umbrella credit structure; will or will not use the shared collateral pool; does or does not contribute to the shared collateral pool.

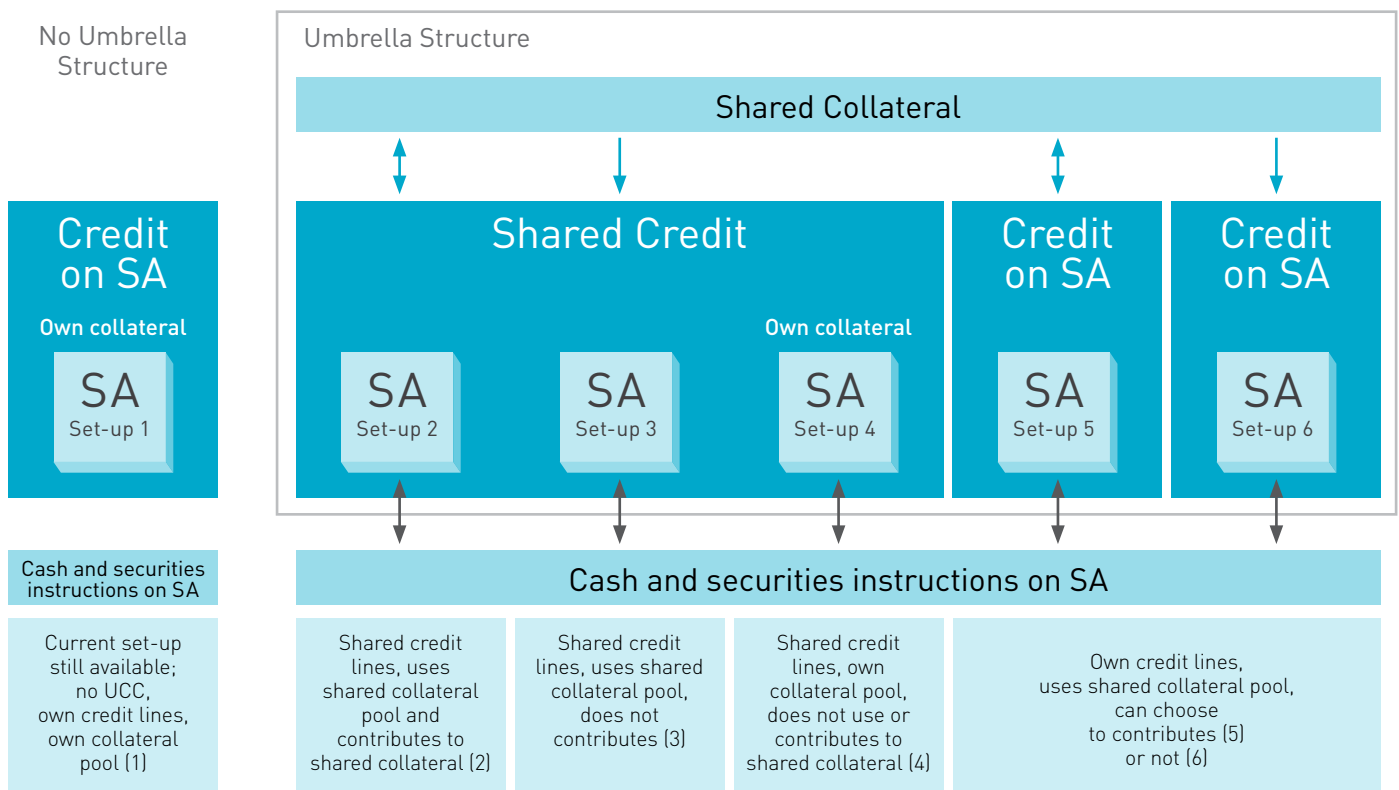
Benefits include:

- Management of one collateral pool only instead of many accounts
- **Increased adequacy of credit lines on individual accounts based on usage:** the credit lines granted will be fully available to all the linked accounts
- **Simplified collateral management:** to meet requirements for collateral,

customers can at any moment simply change or move the collateral value on any of the accounts contributing to the collateral pool rather than freezing it permanently on the specific accounts that require credit

- **Service flexibility:** customers can segregate assets and still benefit from group credit and collateral facilities
- **Collateral optimisation:** individual accounts can access a single shared collateral pool fed by assets available in many customer accounts. By pooling collateral, customers can use the entire collateral pool to support activity in any single account under the umbrella structure.

Examples of umbrella accounts



Automatic securities lending

Fails lending further improves settlement efficiency.

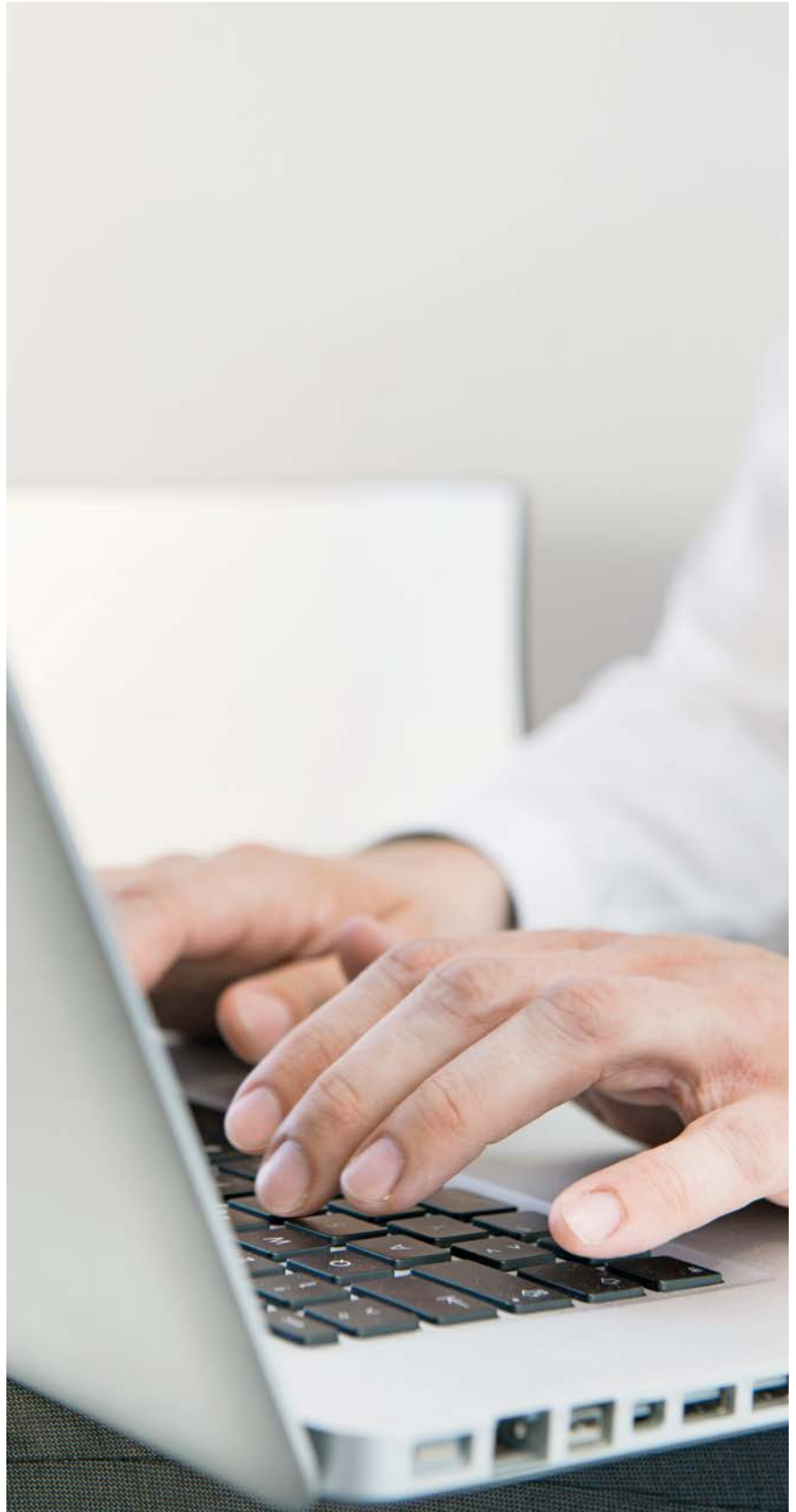
Automatic securities lending, or “fails lending” as it is also known, is designed to further improve settlement efficiency and reduce counterparty risk. Lenders can realise the full potential of their portfolio while at the same time borrowers can significantly reduce the risk of failure.

Loans are opened in real-time throughout the day as and when the programme identifies instructions that cannot settle due to a lack of securities provision. Securities are lent automatically to the delivering counterparty so the instruction can settle.

Financing near to real-time allows for internal and Bridge instruction settlement just before critical deadlines, such as the end of the mandatory period. Domestic instructions are financed several times during the provisioning period, respecting domestic market deadlines.

Most loans are closed within minutes – in fact, we open around 2,000 loans per day. In other words, these 2,000 instructions are processed earlier than otherwise possible due to the efficiency of the lending pool.

Closing loans in real-time is critical for the success of fails lending, as the lent securities can be quickly returned to the lending pool and made available for other automatic loans.



Euro night-time funding link

A flexible way to generate liquidity for settlement during night-time processing by efficiently leveraging your central Euro liquidity pool.

For customers with a TARGET2 RTGS account, our Euro night-time funding link is an efficient cash and collateral management service giving you the chance to optimise your collateral 24 hours a day.

The service operates during the night, while TARGET2 is closed for payment, and allows you to access your liquidity held in the TARGET2 RTGS account. You can pre-set the limit and any available liquidity is used as a collateral source

for settlement of Euro transactions at Clearstream during our night-time processing cycle.

Liquidity taken from this account must be used for EUR settlement but allows you to free up any other collateral held in Clearstream to be used for credit in other currencies.

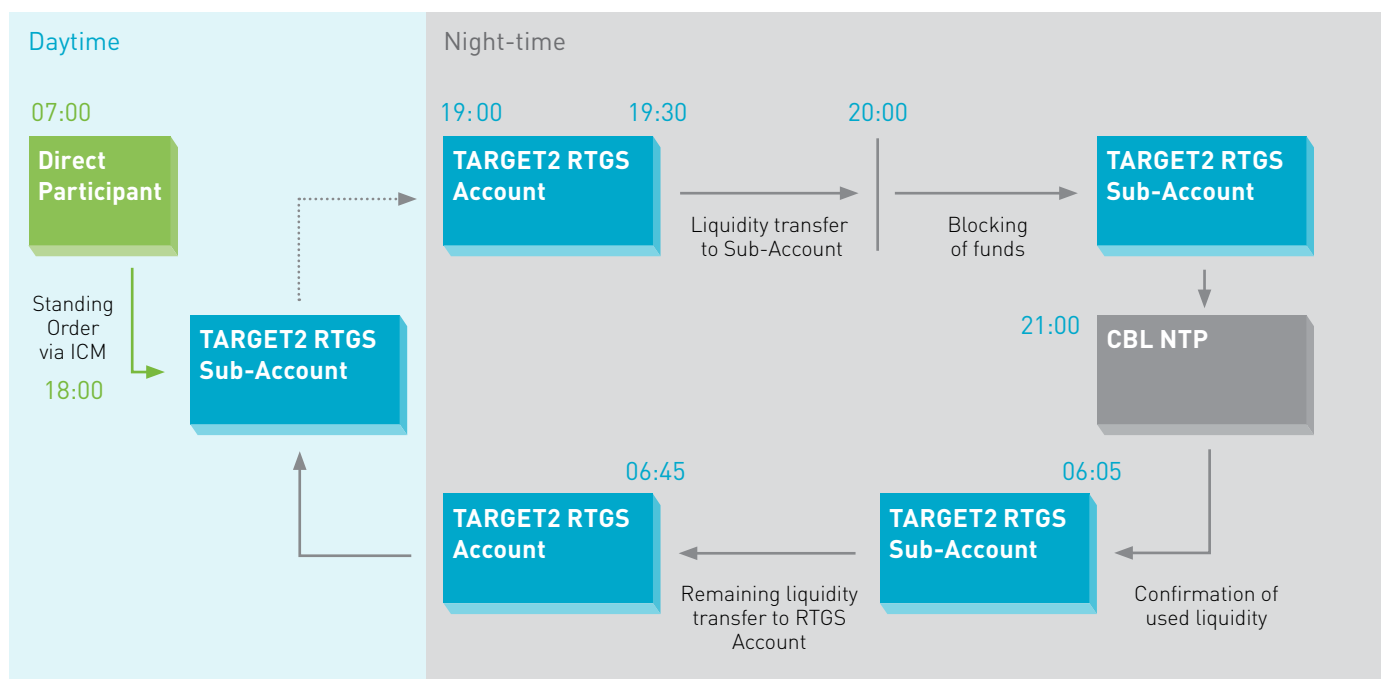
Our Euro night-time funding link has been designed to provide maximum operational and collateral efficiency:

- Only the EUR liquidity used by the service overnight ends up being debited from your TARGET2 RTGS account, up to the value of your pre-set limit. Any debit occurs automatically before TARGET2 opens for payment the next day and any unused liquidity is also freed up before opening, resulting in a clean starting position

- You use standard TARGET2 tools to operate the service, giving easy and full control over the liquidity dedicated to the service
- The service reduces/replaces the need for pre-advise of EUR payments to Clearstream ahead of our night-time processing cycle.

Anyone participating in TARGET2 can take advantage of this innovative service.

Timeline of Euro night-time funding



Other information

Different instruments for DVP settlement

Customers can settle a wide range of securities in Clearstream including:

- Fixed income securities: global bonds, foreign bonds and Eurobonds, domestic bonds (government and corporate, including convertibles), treasury bills and notes, convertible bonds, debentures, stripped coupons and principal, equity-linked notes
- Covered bonds, asset-backed securities and other collateralised debt securities
- Equities – preferred shares, common/ordinary shares
- Depository receipts and depository notes (debt & equities)
- Money market instruments, including short- and medium-term notes, commercial paper and certificates of deposit
- Investment funds
- Entitlements: rights, warrants
- Structured products (including XETRA-Gold certificates)
- Additionally, for selected stock exchanges and instruments, transactions are routed to Clearstream automatically for further processing after trading on the exchange.



Current domestic markets

Argentina
 Armenia*
 Australia
 Austria
 Belgium
 Brazil
 Bulgaria
 Canada
 China
 Croatia
 Cyprus
 Czech Republic
 Denmark
 Dubai
 Estonia
 Finland
 France
 Georgia
 Germany

Greece
 Hong Kong
 Hungary
 Iceland
 Indonesia
 Ireland
 Israel
 Italy
 Japan
 Latvia
 Lithuania
 Luxembourg
 Malaysia
 Malta
 Mexico
 Netherlands
 New Zealand
 Norway
 Philippines

Poland
 Portugal
 Romania
 Russia
 Singapore
 Slovak Republic
 Slovenia
 South Africa
 South Korea
 Spain
 Sweden
 Switzerland
 Taiwan
 Thailand
 Turkey
 United Kingdom
 Uruguay
 USA

Plus the international market.

*Link opens in 2016

Information valid as at March 2016

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