

## The Danish market joining Target2-Securities with DKK

Monday 29 October 2018 was a historic day as the Danish krone (DKK) was migrated to TARGET2-Securities (T2S). The Danish market has settled its first DKK transactions in T2S, verifying the multi-currency set-up of T2S. The migration of DKK to T2S also resulted in challenges for the Danish market as described in this note. It is our intention with this note to elaborate on the transition from a local post-trade market to an integrated European internal capital market. We aim to inform the international market about the challenges, and willingness to overcome these challenges especially, of the transition of a market with segregated accounts at CSD level.

This note describes challenges experienced by the market and the market infrastructure as well as the initiatives already implemented or planned to overcome these challenges. This note does not account for challenges experienced among individual market participants in relation to the migration of DKK settlement to T2S.

The migration of DKK settlement, and the simultaneous release of new VP functionality, started Friday 26 October 2018, prior to the first actual settlement day with DKK in T2S, Monday 29 October 2018.

During the migration weekend and the days after, a number of unforeseen events happened and resulted in delays. The events were caused by unanticipated issues among market participants and at VP. For VP the main issues were:

- During the migration weekend a delay in the deployment process and insufficient processing capacity in relation to communication servers resulted in VP being unable to process incoming instructions from customers and T2S and end-of-day statements for ISO messages.
- Technical issues with the deployment process of VP batch 80 (new settlement batch as of 29 October 2018), which also affected the end-of-day process and batch settlement on 30 October 2018.
- In the days after migration, VP experienced issues with operational stability in VP settlement, also affecting T2S settlement for Danish market participants. This was mainly caused by insufficient processing capacity, and by predefined technical system limitations on the maximum number of messages that the VP system was able to process. VP implemented a change on 3 November that resolved the issue of system limitations. From a technical perspective, VP's system has been operating without notable instability since 6 November 2018. The specific issues experienced on 13 and 19 November 2018 were due to operational errors.
- A number of participants communicating with VP in ISO format experienced delays in VP processing time of ISO messages compared to VP processing time of messages in VP proprietary format. In the first days of operation post migration, participants communicating with VP in ISO format therefore experienced a number of challenges, for example with the submission of instructions for settlement at VP, plus subsequent receipt of confirmations, and they therefore risked operating on a not entirely updated basis of information, affecting their ability to serve their own customers. This was a knock-on effect of the above-mentioned issue with operational stability. The delays were reduced significantly by 2 November 2018. These challenges were resolved by 15 November 2018.

- Participants experienced longer response times when using the VP GUI interface (vp.ONLINE) compared to prior to the migration. The response times were brought back to pre-migration level by 10 November 2018.
- During the first settlement days post migration, VP did not send out all end-of-day statements in ISO format for a number of participants, which meant that the affected participants risked operating on a not entirely updated basis as regards the relevant reconciliations. This issue was resolved within the first week. Although the issue had been resolved from a VP technical perspective, some participants experienced that a few end-of-day statements were delayed during the subsequent week(s).

Because of these issues, VP activated its Crisis Management on 29 October 2018. The status of the migration and the operation post-migration was reported on a daily basis to the Danish overseers, The Danish Financial Supervisory Authorities (FSA), the Danish central bank, and the Danish Financial Sector Forum for Operational Resilience (FSOR). In addition, a list of issues and the progress in solving these issues was shared with the market participants on daily calls. VP Crisis Management was deactivated when most critical of the above-mentioned issues were solved and operational stability was restored by 12 November 2018. The events were not caused by errors in the deployed software, but mainly by insufficient processing capacity or incorrect configurations.

On the cash side, the migration to T2S went well as the Kronos2 functionality on T2S all worked as intended.

## **Many unmatched instructions following migration**

Following the DKK migration to T2S, there were around 39,000 unmatched instructions<sup>1</sup>, and the daily settlement efficiency rates were around 90% against previously over 97%. This was primarily caused by differences in the implementation of the new match criteria by the market participants, including the new market practice for third party trades and the complexity added by the different communication formats. There were also different ways in which the T2S functionalities, such as the linking of transactions in T2S, had been implemented across the various business models, being sub-custody or mainly retail, and unexpected results were caused by static data set-ups and changed standard settlement instructions details (SSIs). The complexity caused by both the various possible communication channels and different interpretations of the agreed market practice indicates that further detailed clarifications and discussions between VP and VP participants could have been beneficial.

Together with the three VP participants having the most unmatched instructions, VP set up a task force seeking through intense effort to locate root causes and clarify reasons for the non-match of instructions. The three participants were Danske Bank, Nordea Bank and SEB, representing the bulk of custody activities in the Danish market. The task force identified seven main issues, five of which had been resolved by end-November, and two are being addressed by VP through dialogue with VP participants. In hindsight due to the market norms in the Danish market, e.g. end investor accounts in the CSD and settlement of third-party trades, there could have been a more intense testing of these functionalities.

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<sup>1</sup> A transaction consists of two instructions, or transfer orders.

## Wrap-up on main issues

The Danish market joining T2S has been a lengthy and complex process starting almost 12 years ago. The market and VP have made a number of important choices and critical decisions along the way, which led to the final migration of DKK to T2S on 29 October 2018. Some of these decisions have added to the complexity of the implemented solution and thus led to several of the issues experienced by market participants and VP after the migration. Some of the main issues have been:

- The early decision of implementing a layered account model aiming at ensuring the continuation of the Danish and Nordic tradition of segregated retail accounts at CSD level, which requires alignment between two platforms.
- The decision to divide the implementation into a temporary solution for EUR settlement in 2016 and permanent solution for DKK and EUR settlement in 2018.
- Differences in interpretation of the market practice for third party transactions, resulting in huge matching problems.
- The decision to support both an ISO and a proprietary format for settlement instructions in combination with the agreed market practice (e.g. third-party transactions) has made the matching criteria more complex.
- The possibility to operate several different account models resulting in more or fewer accounts on the T2S platform.
- The chosen models require updates of SSIs at customer level, which has been difficult to achieve in practice.
- The delay of Kronos2 created uncertainty for the participants even though the test period for T2S was unaffected and the go-live of Kronos2 on 20 August went as planned. Finance Denmark has mentioned that the sector still saw a high risk of having two big go-live dates so close together. This would give limited time for bug fixes after the go-live of Kronos2 and limited time for custodian banks to make system and legal adjustments for their foreign customers.
- The number of defects reported in relation to the VP platform during testing and the time it took to correct them gave less time to re-test.
- The operational issues that VP experienced during the migration weekend and two weeks after the migration resulted in delays in settlement instructions and end-of-day reporting. This made it difficult for some market participants to operate on updated positions.

## About the decisions made

All key decisions were taken by the NSG. At the time of migration, all participants had declared themselves ready for migration and the NSG declared the market ready. The NSG did not have the information before migration to foresee the problems that occurred after migration. In hindsight, knowing these problems, it is clear that there should have been more emphasis on testing also across the market and among the participants. This could have revealed important information regarding their readiness and allowed for addressing the problems prior to migration.

VP and the market participants are dedicated to restoring market efficiency and market confidence. Based on the feedback from the task force banks, the NSG and individual market participants, a number of improvements have been made and other potential improvements identified. These are currently being discussed, and initiatives both short-term and medium-/long-term have been launched. Results from these initiatives are expected before summer 2019. Even

though settlement rates have improved and are almost back at pre-migration level, the market still strives to improve STP rates and settlement efficiency.

### **The way forward – short-term initiatives**

Based on the recommendations from the task force, requests from individual participants to support their implementation, input from market participants and discussions with the Market Expert Group under the NSG, VP has identified a number of short-term initiatives that would solve some of the identified issues. These initiatives relate to the following:

- Link on T2S transfers (implemented end-February 2019)
- Partials on T2S transfers (expected September 2019)
- T2S transfers in relation to VP netting (expected September 2019)
- Possible removal of pre-matching for T2S settlement (based on market consultations)
- In addition, a number of smaller defects and functional enhancements will be resolved during Q2 2019
- Corporate actions on flow.

### **The way forward – medium-term initiatives**

In addition to the ongoing discussions on potential short-term fast fixes, VP has been urged by the task force banks to facilitate an investigation into a possible future, more harmonised model for scale, in line with European standards.

Aiming at the medium-/long-term adaptation of the Danish market to the European market infrastructure, the topics to be covered should at least include:

- Account structure
- The need for establishing new market practice(s)
- Harmonisation of matching standards
- Communication protocols

VP has invited the taskforce banks together with VP to scope such a project and have chosen an external adviser that can bring a third party view and insight from international market models to the project. VP expects such a project to be initiated within a few weeks. During this process, VP consults the market and gather feed-back before decisions on possible new structures are implemented. This process should ensure that the Danish securities market are back to high settlement efficiency, high STP-rates and stable connection to the T2S markets.