

Overview

DEPO/X is a Central Securities Depository (CSD) system designed to support securities management, settlement, clearing and collateral management operations as well as closely related business areas like auctions, monetary operations, etc.

The System is based on a modern component-based business process driven approach. It offers full functionality of Central Securities Depository with integration into Financial Market infrastructure.

SOA-oriented approach allows ease integration with external systems such as Trading systems and payment systems of different nature (e.g., RTGS, ACH, Core Banking etc.). The system has built-in support of SWIFT message formats such as SWIFT MT (incl. ISO15022), SWIFT MX (ISO20022). For interface with Trading systems FIX protocol is supported. The system may communicate with Participants and other systems via different channels and interfaces including SWIFT network, SOA services, JMS etc. Several access methods may be used in parallel.

DEPO/X is a part of family of products. CMA Financial Suite for National, Central banks and Central Securities Depositories contains a set of flexible and scalable solutions seamlessly and transparently integrated on STP principles (Central Securities Depository, RTGS, ACH, Cheque truncation system, Auction and real-time trading systems). From business point of view they furnish the unified powerful integrated platform where all business functionalities are in place. It's a great advantage to use unified platform as there is possible to have rich functionality covering all business requirements and at the same time save resources for administration of the solution and personnel trainings.

DEPO/X also can be configured as mixed environment containing both depository and trading functionality within one package. Such configuration can play a role of intermediary open market system interacting in online or if required offline mode with external system(s): Central securities depository, RTGS/ACH, Stock exchange, Financial information providers, etc.

DEPO/X Functionality

Functionality of the system covers all CSD requirements including securities management, corporate actions, portfolio management, investor management, settlement and clearing services, collateral management, multicurrency support, billing and tax services, statistical analysis etc.

Main functions of DEPO/X Core are listed below:

- Securities registration and issuance
- Securities safekeeping: domestic securities and securities issued abroad
- Corporate actions processing
- Support of custodian services
- Sharia - compliant securities support (Mudaraba, Ijara, Mubaraha/Istina, Musharaka and etc.)
- Physical issues management
- National numbering agency services

- Settlement and clearing services
- Cross-border settlement
- Queue management
- Settlement based on DvP (model 1,2,3), FoP, DvD, PVP models
- Support of Securities lending and borrowing, REPO, Total Return SWAP, Pledge, FX, FX SWAP operations
- Monetary operations support

- Collateral services including
 - Collateral valuation/re-valuation
 - Margin calls
 - Collateral top-up, release and substitution
 - Collateral execution and default handling

- Risk mitigation facilities
- Liquidity management

- Managing of Participant directory (Central Banks, Ministry of Finance, Commercial Banks, Securities Dealers, Custodians, Individual and Institutional investors etc.) and static data
- Managing of Participant's accounts
- Investors management
- Billing and tax processing
- Online monitoring
- Enquiries processing
- Event processing

- Comprehensive report generation module

- Message exchange with Participants via Secure Extranet or SWIFT network
- Processing of messages received from Participants
- Routing of answers and unsolicited messages to Participants
- Integration with external CSDs and ICSDs including Clearstream and Euroclear
- Integration with external Payment Systems

- Integration with Stock Exchanges and external ETP systems
- Integration with internal Central Bank's systems
- Integration with external Financial Service Providers (risk parameters, market prices, ratings and etc.)
- Integration with National Investor Repository

- Access rights management and security control (provides complete segregation of sharia and conventional bank functions)
- Auditing, supervision and control functions
- Archiving

- Other:
 - Multi-currency support
 - Multi-country support
 - Automated business day management
 - Operations suspension/resuming
 - Multi-step approval of operations

Technical View

DEPO/X solution consists of following major components:

- DEPO/X Central Node is responsible for CSD system functionality;
- DEPO/X Participant' platform provides Participants' access to the system. This platform may have different configurations (GUI-based, API-based, mixed etc.) to fit needs of a particular Participant and generally consists of Transaction platform to provide transaction message exchange, and Monitoring platform used for monitoring and control purposes from Participant' perspective;

Scalability

DEPO/X system uses multitier architecture:

- 1st Tier** – database level, represented by Oracle RDBMS, responsible for data management,
- 2nd Tier** – application level, represented by DEPO/X Core software, responsible for core system functionality,
- 3rd Tier** – presentation/access level, represented by Gateway software and Web server that provides web access to DEPO/X system.

All components can be installed on one or several servers. For DEPO/X system each tier will be installed on dedicated server. Such approach allows building easy-scalable system as each level supports scalability to increase overall system performance. System performance can be improved in future by increasing number of servers for each or particular level or upgrading servers that are used for integrated system.

Reliability

DEPO/X server and network solution is designed for redundancy and scalability. There is no single point of failure within the primary system. The components are working in active/passive high available and active/active load sharing modes. Specifically for network infrastructure, all network switches, routers and firewalls within the primary site have redundant components for load sharing and resilience purpose.

System at the secondary site is identical to the primary site in all aspects except high availability and redundancy. Our experience of implementing and supporting similar mission-critical settlement systems proved that redundant configuration should not be provided for the backup site: it is not cost-effective to provide backup for backup. System at the secondary site provides backup for the case of disaster or major failure in the primary site or other contingency cases.

To cater for disaster, the infrastructure is designed such that the business operation can be resumed with minimal data loss in case of disaster. In addition, it is designed in ways that switch over from primary site to disaster recovery site and vice versa can be achieved within very short period of time. Typically such a switch requires ten to fifteen minutes after IT and operations staff arrives to backup site.

Performance

DEPO/X system can manage thousands of Direct Participants, millions of investors and process hundreds of thousands transactions hourly on a middle-class hardware equipment.

Business Continuity

A continuous operation of the system is a key objective from the point of view of business-process reliability. In order to follow this objective, there is a set of measures intended to increase system fault-tolerance. Impact of software and hardware failures can be reduced or eliminated by means of creation of the backup copies, redundancy and mutual backup of the hardware equipment. These measures are described below.

Proposed solution uses both built-in features of DEPO/X application software and infrastructure support (such as high available cluster, redundant hardware, disaster recovery solution) to eliminate single points of failure and provide very high availability level. Effectiveness of the proposed solution for achieving the required service availability & business continuity is proven by DEPO/X systems in “live” operation.

DEPO/X has built-in features to deal with system failures.

In case of a general fault of the service (such as disaster impacting the Main site), the resumption of service using the backup system in the alternate site requires less than 30 minutes after failover started, assuming availability and commitment of all the resources necessary for the recovery, including CSD’s IT staff in the alternate site.

Compliance

DEPO/X development and implementation processes are compliant with the following standards and certification programs:

Principles for Financial Market Infrastructures (“PFMI Report”), published by the Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO)

- GMRA2011: 2011 Global Master Repurchase Agreement;
- Securities Market Practice Group (SMPG) recommendations;
- ISO 15022: ISO Standard for messaging used in securities trading;
- ISO 20022: ISO Standard for Financial Services Messaging;
- ISO 6166: ISO Standard defining the structure of an International Securities Identifying Number (ISIN);
- ISO 10962: ISO Standard defining the structure and format for classification of financial instruments;
- ISO 9362: ISO Standard defining a standard format of Business Identifier Codes;
- ISO 3166: ISO Standard defining codes for the names of countries, dependent territories, special areas of geographical interest;
- ISO 4217: ISO Standard for currency codes;
- ISO 13616-1:2007: Specifies the elements of an international bank account number (IBAN);

- FIX Protocol Standards;
- ISO/IEC 27001:2005 Information Security Management System standard;
- ISO9001:2008 certification for “Quality management system”;

Implementation View

CMA's implementation procedures cover the design, development, supply, installation, configuration, testing, implementation, delivery and support of DEPO/X system. Responsibilities are aligned with these management streams both within the CMA team and, correspondingly, within the Client's team. The project is further divided into phases that include requirements analysis, testing and training. During all the different phases of the project, the CMA team works very closely with their counterpart at Client site.

To supplement the local knowledge and cross industry project expertise of the Client, CMA assigns a dedicated team for project implementation which brings their individual experience of implementing DEPO/X system and other banking project expertise to the successful delivery of the Clients projects.

DEPO/X Key Benefits

CMA delivers a modern solution based on extensive experience that company has in a number of similar projects, the key benefits of the DEPO/X are listed below:

- CSD requirements including securities management operations, corporate actions processing, settlement and clearing services, collateral management operations, liquidity management facilities, multicurrency support, billing and tax services, statistical analysis etc.;
- The systems are based on proved, high-reliable, state-of-art and efficient technologies that are successfully implemented and used in a number of projects throughout the world;
- Business Driven approach provides transparency of application behavior from business point of view. Graphical description of system functionality allows CSD staff to better understand the system behavior and thus significantly decrease the “human error” risk factor;
- High level of STP-processing is based on automated processing of all requests and uniform data presentation based on XML standard and SWIFT standards;
- Settlement models: DvP models I, II and III, FoP, DvD, Pvp are built-in functionality of CSD solution. Settlement models in CSD solution may function with any external system that support these models as well;

- Development approach and technology used together with an advanced training course set gives a very high level of knowledge transfer to CSD staff necessary for support and maintenance of the System;
- Flexibility of technology used in solution allows smooth adaptation of the system according to regulations and business policies changes and evolutions;
- Multi-tier modular design provides high performance and scalability. It is possible to distribute the load within each Layer and between Layers. All processes may be executed in parallel. The solution supports:
 - automatic load balancing;
 - manual distribution depending on the user groups;
 - manual distribution depending on the function groups.
- Easy extension of functionality and manageability of the solution is based on modular design ensuring a “granularity” nature of changes during customization; only affected modules should be changed ensuring easy and flexible management of the entire system or its separate components;
- Powerful monitoring of business, application and system behavior is available to CSD administrators providing full picture of system behavior, Participant’s and their Users activities, bottlenecks, etc. Component-based architecture allows monitoring and audit the behavior of separate modules and components; and the entire system;
- The system has built-in Integration Bus that incorporates a set of dedicated tools for connection with other external applications. Integration Bus includes special components, so-called Adapters that allow establishing of information exchange with External applications using commercially available third-party tools and protocols like WebSphere MQ, MSMQ, SAP etc. The adapters perform necessary message transformations to/from external systems’ proprietary formats. This allows the Client to perform seamless and intelligent integration of DEPO/X with his existing systems.
- The basic package utilizes SWIFT network and/or Secure Extranet for instruction exchange. The Secure Extranet may function as a backup network or even in a parallel with SWIFT network if CSD will decide it useful. In case of “mixed” network solution some of Participants may use SWIFT network and others may utilize Secure Extranet. This functionality and all necessary software components are included into the basic package of the solution;
- The basic package utilizes Secure Extranet for monitoring;
- The solution is fully SWIFTNet-Ready and supports full range of SWIFTNet services: InterAct, FileAct and Browse services that may be used for monitoring together or instead of monitoring via Secure Extranet;
- Runs on any platform supporting Java (Windows, UNIX, Linux, AIX, HP-UX, Solaris);