

Technology@NSDL

An Emerging Market Perspective

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Individual Segregation at CSD



- **Mandatory Individual Segregated Accounts at CSD**
 - Beneficial Owner name on the Account
 - Legal title to Accountholder
 - Full protection from participant default
 - Portability in case of participant failure
 - Unique Client Identification using Tax ID
 - Client can use any Broker
 - Any ISIN can be held in the account
 - No trading in physical shares
- **Individual Position Computation at CSD in real time**
 - Varied account types with differing needs
- **System accessible throughout India**
 - NSDL accounts held in 87% of PINCODEs in India

Number of accounts

13.7

million

A new account
opened every

6

seconds

Custody Value

US\$ **1.8**

trillion

ISIN Positions

62

million

High Transaction Volume

- Individual client instructions processed at CSD
 - Transfer orders entered in CSD achieve finality in real time
 - Participants send individual client instructions to CSD
- 85% of instructions are electronic end-to-end
 - CSD provides electronic instruction capability to clients. Can be routed through participant or sent directly to CSD.
 - In 15%, clients give physical signed instructions to participants
- Instantaneous text alerts sent to clients on mobile phone
- NSDL offers electronic trade confirmation service to institutional investors

Number of transactions

240

million

Electronic Trade
Confirmations

300

million

Transaction Alerts on
Mobile Phone

60

million

Mutual Fund Consolidation

- India's vision for depository account to hold all financial investments
 - Announced by the Finance Minister in July 2014
- Beginning made by consolidating mutual funds folios registered with Registrars
 - Aggregation based on unique client identifier viz., Tax ID
- Mutual fund holdings and transactions included in CSD statement

Number of mutual fund
folios aggregated

250

million

ISIN positions

12

million

Direct Statement Despatch to Clients



- **Statements are sent to individual clients by CSD**
 - Includes mutual funds registered with Registrars
 - Option to client to receive by email or physical
- **Direct Account Access from CSD**
 - Depository Account accessible on internet for real time holding and transaction information
 - Mobile apps on iOS and Android
 - NSDL issues login credentials to clients

Physical Statements
sent by snail mail

5

million

Email Statements

6

million

In March 2015

Scalable infrastructure

- **High capacity infrastructure to process peak load**
 - Can process 1.3 million transactions per hour
 - Can be scaled to 2.6 million transactions per hour in short time
 - Vertical and horizontal scalability
 - Considerable investment in application architecture optimisation
 - Performance-oriented database design
- **IBM Mainframe infrastructure**
 - Z10 systems for core CSD application
 - DB2 database
 - Data warehouse for archival
- **Virtualisation and load balancing techniques**
 - On demand provisioning of capacity
- **Real time monitoring of resource utilisation**
- **Light infrastructure at Participant**
 - No computation of client positions needed

Cost-efficient infrastructure

- Low average ticket size makes cost per transaction a critical parameter
- Mid-air change of engine on a Jumbo Jet
 - Rewrote the entire depository application, completed in 2010
 - Portability across platforms and databases
 - No vendor lock-in
 - 5-year TCO based bidding resulted in significant reduction in infrastructure cost
- Code optimisation resulted in 8 fold increase in throughput
 - Old system: 1595 MIPS – 300,000 transactions / hour
 - New system: 890 MIPS – 1.3 million transactions / hour
- Lower operating costs
 - Judicious mix of insourcing and outsourcing
- NSDL fees to participants
 - US\$ 0.07 flat fee for debit transaction, credits are free
 - US\$ 0.13 annual flat fee per ISIN position to issuer
- Participant infrastructure investment minimal
 - Local database replication for better response times

Anywhere access

- **Depository application available anywhere using a web front-end**
 - Branches of participants can access web front-end
 - Computer-to-computer link through file exchange. Hands-free operations possible.
 - In theory, participant can directly service clients using CSD infrastructure
 - Participants need back-office product for special needs
- **Depository account available to clients on desktop and mobile**
 - Real time view of holdings and transactions
 - Issue electronic instructions
 - Electronic Voting
- **15000 service centres of participants across 1500 cities/towns**
- **Anywhere access also introduces security challenges**
 - Appropriate security measures

Reliability of Infrastructure

- **No market disruption**
 - No instance of missing settlement on scheduled date
 - Few instances of delays.
- **Strong DR capabilities**
 - ISO 22301 certification for Business Continuity and Planning for Depository Applications
 - Regular drills of shifting to DR site including intra-day
- **Security infrastructure**
 - Certified for implementation of controls complying with ISO 27001 Information Security Management Standards
 - Registered as nationally critical infrastructure institution with National Critical Information Infrastructure Protection Centre (NCIIPC)
 - Participates in cyber security drills conducted by Indian Computer Emergency Response Team (CERT-in)

Thank you

Large volume market

Equity Trades in 2013

	Exchange	No Trades in Million
1	NSE India	1449
2	Shenzhen	1289
3	NYSE Euronext	1188
4	Shanghai	1153
5	NASDAQ OMX	1152

Source: World Federation of Exchanges

Trades in Stock Futures in 2013

	Exchange	No Contracts in Million
1	Moscow	303
2	Eurex	179
3	NSE India	166
4	NYSE Liffe (Europe)	130
5	Korea Exchange	96

Source: World Federation of Exchanges

Trades in Index Options in 2013

	Exchange	No Contracts in Million
1	NSE India	930
2	Korea Exchange	580
3	CBOE	373
4	Eurex	317
5	BSE India	250

Source: World Federation of Exchanges

Trades in Index Futures in 2013

	Exchange	No Contracts in Million
1	CME	573
2	Eurex	327
3	Moscow	268
4	Osaka	265
5	China Fin Futures Ex	193
6	NSE India	102

Source: World Federation of Exchanges