



Next Generation Financial Markets

March 2017

CONTENTS

- I Introduction
- II Features
- III Infrastructure and Standards
- IV Member Company's Interface
- V Next Steps

1. Overview

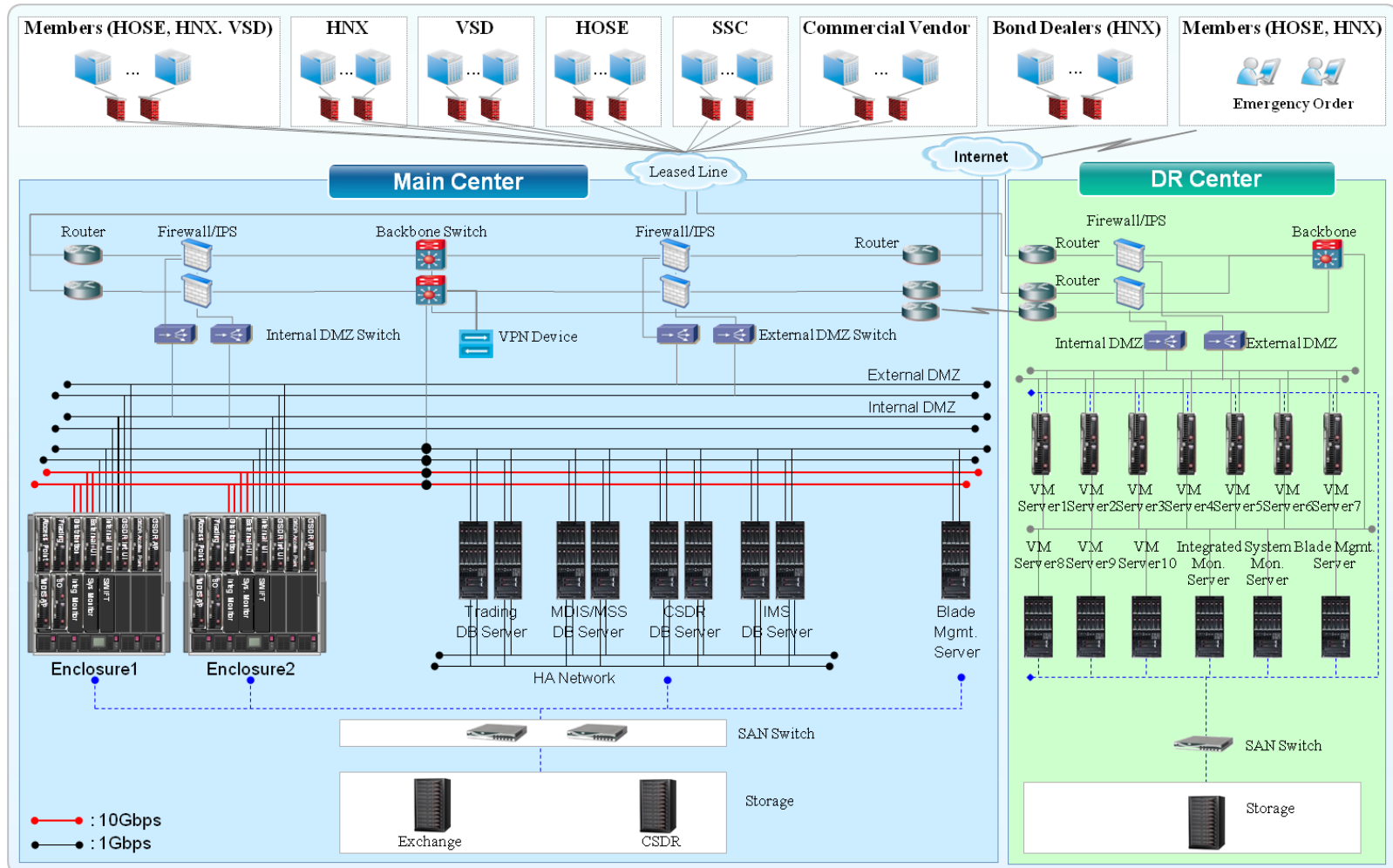
Introducing advanced market technology solutions

Technology	▪ Provide leading technologies
Business	▪ Enhance business services that meet global standards
Performance	▪ Improve the performance and capacity of the system
Convenience	▪ Facilitate market control and system management
Cost	▪ Reduce market system operating costs

Advancement of Vietnamese Capital Markets

**Reliable, Efficient, Orderly, and Seamless
Market Operations**

1. Overview



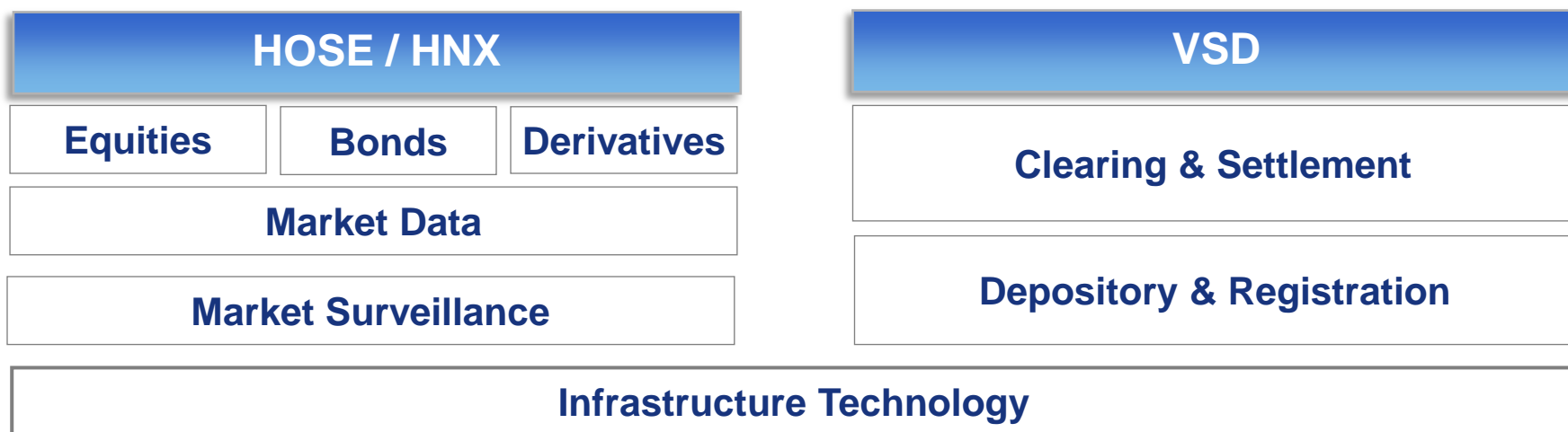
2. Goal

The System is a comprehensive, fully integrated financial markets system intended to modernize the regulated financial markets in Vietnam. Specific objectives to satisfy the goal include:

- enhanced products and services;
- improved and enhanced market operations; and
- modernized information technology (IT) and improved IT operations.

3. Scope

Project covers end-to-end market technology solutions for
HOSE, HNX and VSD



II. Features

- Fundamental market design generally retained
 - Automated auction
 - Bilateral negotiation

- One fundamental change

Bilateral negotiation - current

- Block trades facility for equities
- Only method for bonds

Bilateral negotiation - future

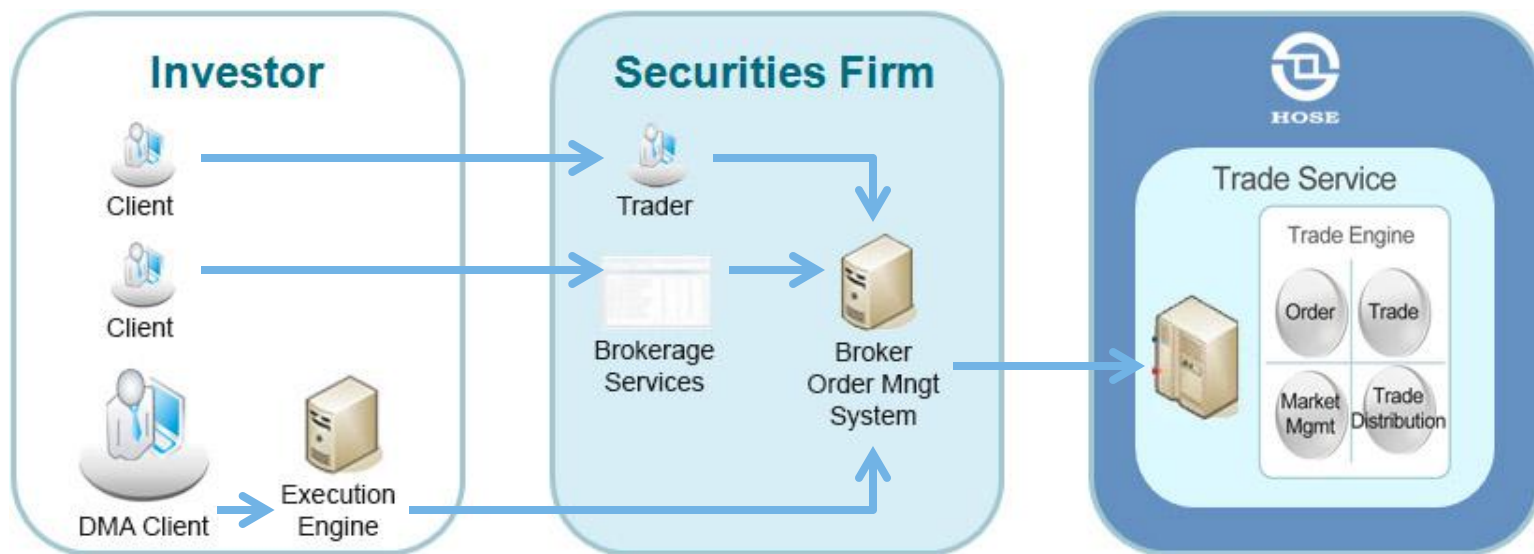
- Block trades facility
- Off-market products

- Many enhancements. New products. New services. New order and matching capabilities.

- More products, more boards
- ETF and warrants already coming to market
- Futures indices build on successful reference indices
- Eventual commodities futures
 - Energy
 - Metals
 - Agriculturals



- Direct Market Access
 - Extending access to important end clients
 - Connecting via FIX protocol, a global standard
 - Bandwidth via VPN or leased line



- Significantly more order types & order qualifiers available
 - Order without price
 - Market Order
 - Stop Market Order
 - Same Side Best Order
 - Opposite Side Best Order
 - Order with price
 - Limit Order
 - Stop Limit Order
 - Iceberg Order
 - Cancel and time conditions can be attached to an order
 - FAK (Fill And Kill)
 - FOK (Fill Or Kill)
 - GTC (Good Till Cancel)
- Many other enhancements. Quoting. Market Making

1. Non-functional

- Availability
 - Systems is designed to achieve 99.95% availability with zero data loss
- Performance
 - 1000 transactions per second
 - 400 deals and 800 order executions per second
- Response time
 - Orders = < 10 millisecond
 - Order executions = < 5 millisecond
 - Market data updates = < 10 millisecond

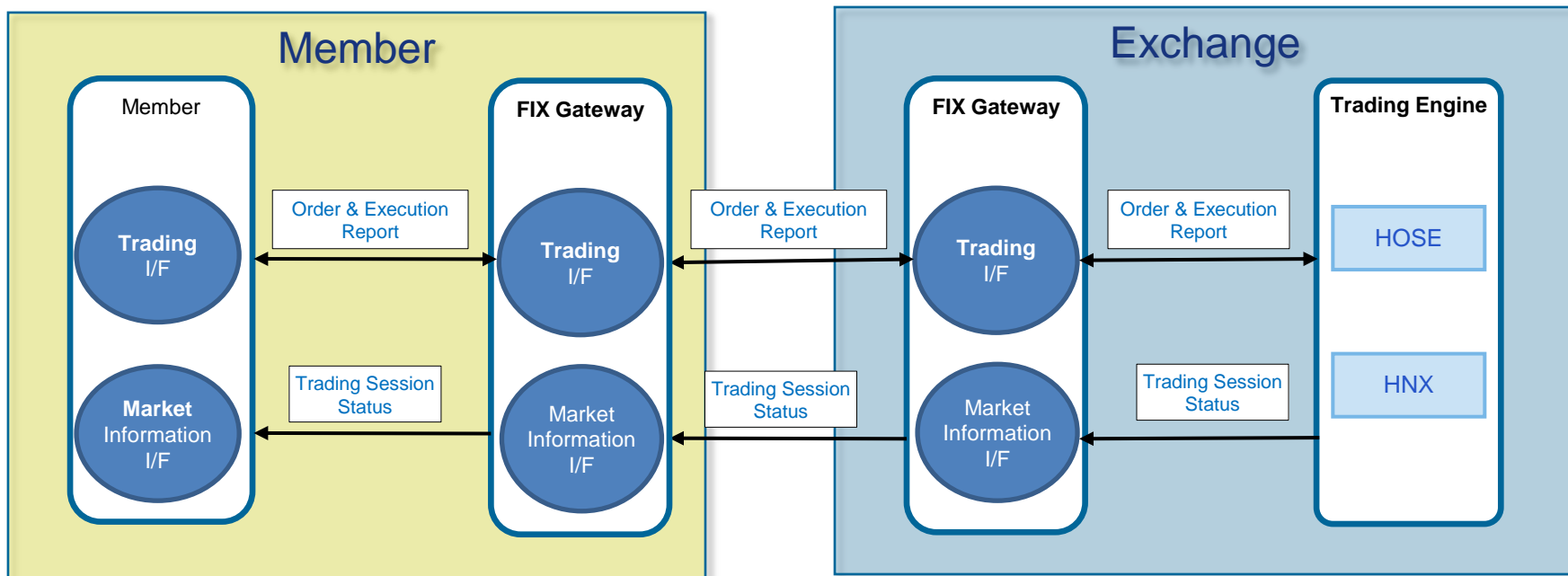
2. Technical Standards

- Open systems architecture
- FIX messaging protocol for trading and market data

Components & Features	Global Trend
Server	- x86
OS	- Linux
Messaging Middleware	- Low latency middleware
N/W	- High speed NW (10G)
Order book	- Memory based
Disaster Recovery Mechanism	- Application fail-over mechanism based on message duplication rather than disk

IV. Member Company Interface

- FIX Protocol is used when transmitting(two-ways) messages between member system and exchange systems (HoSE and HNX)
- FIX Gateway consists of two interface(I/F) - Trading I/F, Market Information I/F



Terms							2017						2018								
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
Major Milestone	Analysis (3M)			Design (4M)			Coding & Unit Test (4M)			System Integration Test (3M)			User Acceptance Test (6M)			Go Live					
Member's System							①		②				③								

Exchange meets with member firms 1 month before

- ① Exchange distributes interface specifications for member system
- ② Member Development phase begins for Member's IT system
- ③ Tests

Thank you