

NYSE Technologies

Technology Enabling Business

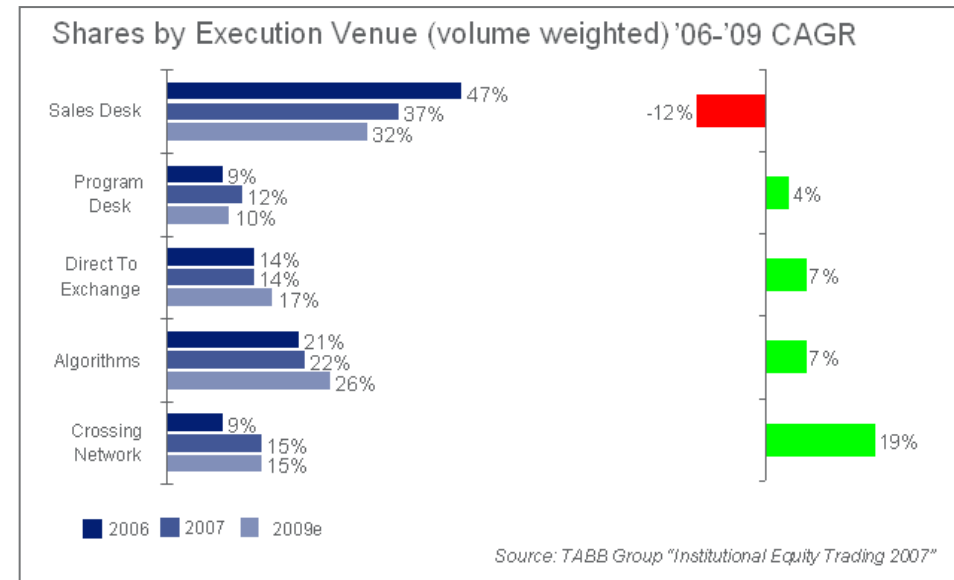
Changing Environment for Exchanges

- Industry Challenges
- Evolving the Exchange's Technology
- Expanding the Exchange's Value Proposition

Industry Challenges

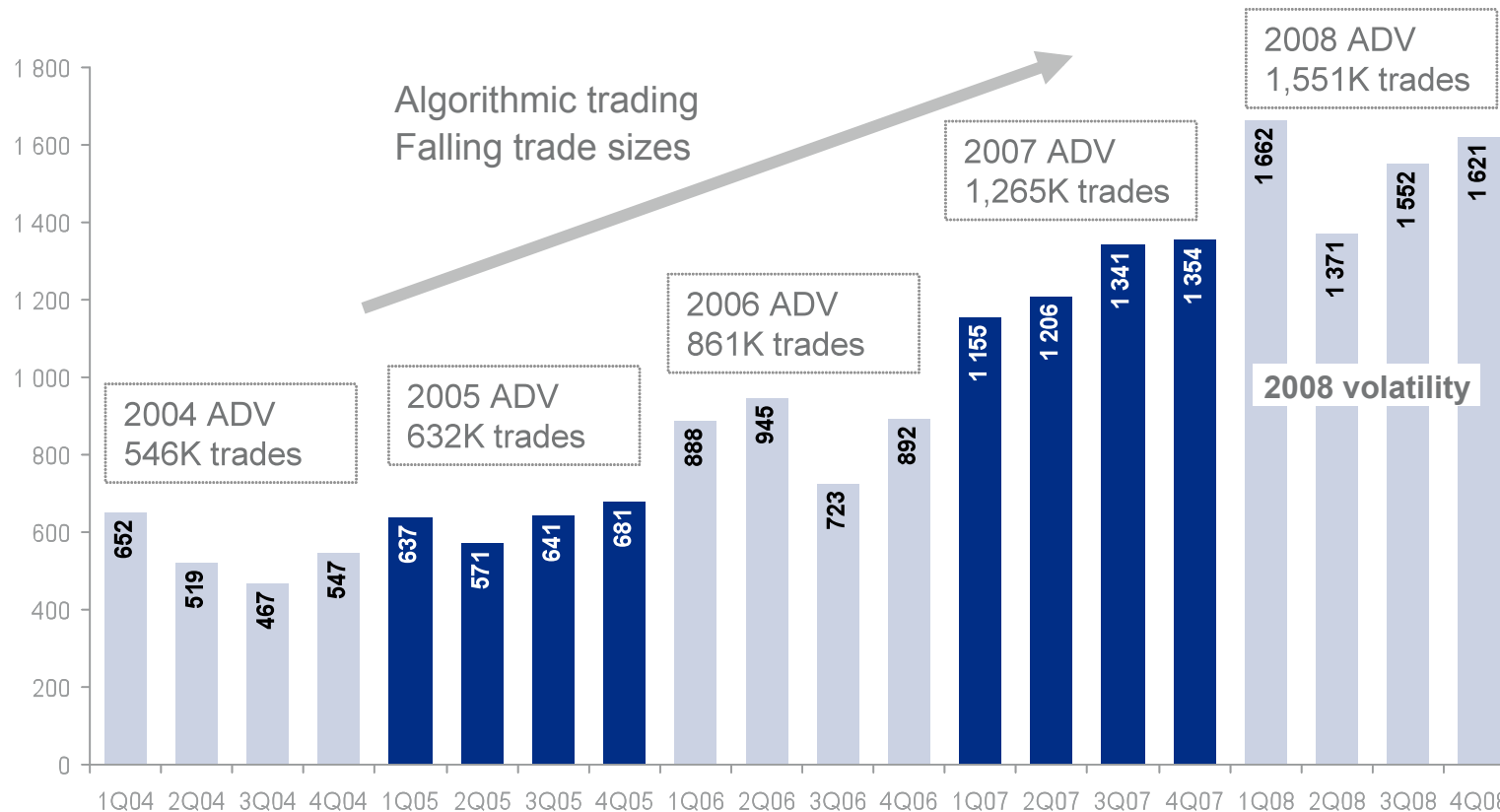


- Technology driving business



- Volume Growth

European Cash Volumes have been Driven by the Growth in Algorithmic Trading



Source: Company data

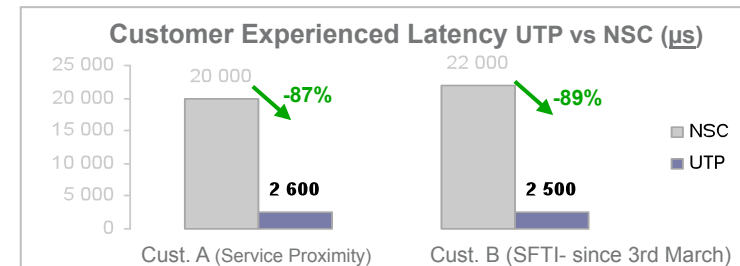
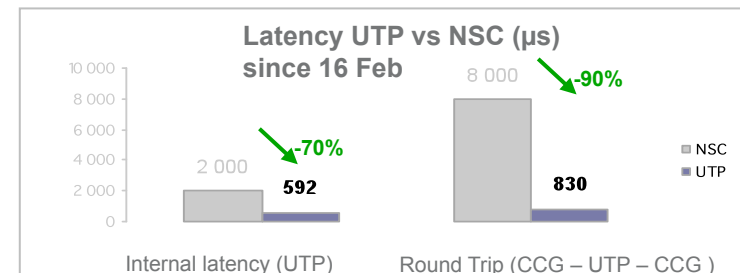
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Matching Engine - Universal Trading Platform

- Drastic latency decrease (90%) experienced by clients since 16 Feb
- Significant progress of CCG Market Share (35% Traded Volume)
 - 11 Customers
- Current observations
 - EBBO presence time up ↗ from 40% to 55% (AEX & CAC 40)
 - Increase of our Trading Market Share (~ +1pt)
 - From 76.6% to 77.8% on AEX
 - From 78.4% to 79.5% on CAC40
- Latency figures
 - Minimal internal latency: 281 micro-second (UTP)
 - Average internal latency: 592 micro-second (UTP)
 - Minimal roundtrip: 551 micro-second (CCG – UTP – CCG)
 - Average roundtrip: 830 micro-second (CCG – UTP – CCG)
- Some members feedback
 - CUSTOMER A declared having 2.5 milli-second full roundtrip, from their proximity service location
 - CUSTOMER B declared “their traders are happy with UTP” 5 milli-second full roundtrip, from their Paris location
 - CUSTOMER C declared “their traders are happy with UTP” 13.5 milli-second full roundtrip, from their Amsterdam location
 - CUSTOMER D declared seeing 40 % full roundtrip improvement, from their Dublin location





Market Data - Exchange Data Publisher

- **High Performance**

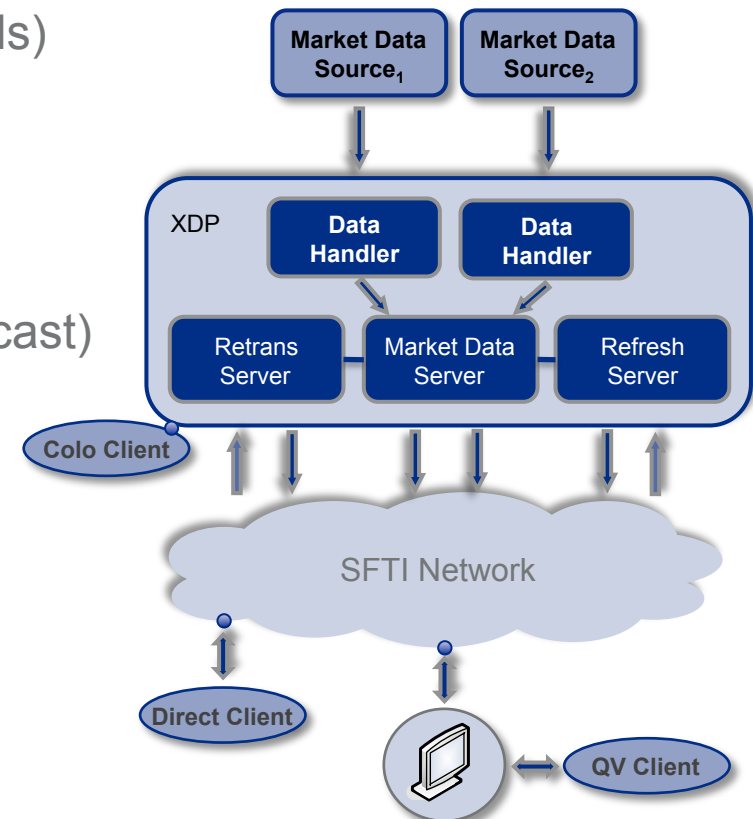
- Ultra low latency (less than 50 microseconds)
- High throughput (over 75,000 msgs/sec)

- **Flexible Data Management**

- Efficient delivery of market data (over multicast)
- Enrich data
- Productize (and commercialize) data

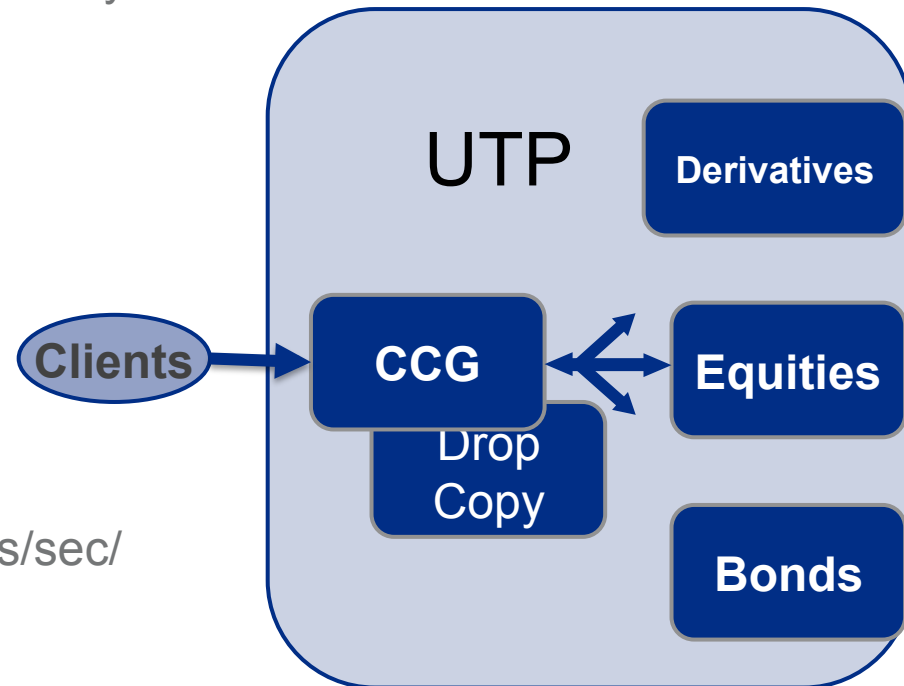
- **Advanced Bandwidth Management**

- Data compression
- Packet management
- Data throttling



Order Flow - Common Customer Gateway

- **Single gateway for all markets**
 - Common format simplifying connectivity to all markets
 - Supporting FIX and Binary
- **High Performance**
 - Ultra low latency (less than 200 microseconds)
 - High throughput (over 10,000 msgs/sec/ connection)





The Data Centre - Co-location Strategy

- Near London
 - NYSE owned
 - 315,000 sq ft
 - 16 Acres
 - 7 x 10,000 Sq Ft Pods
 - 3 pods on day 1
 - 100 W/ft² up to 300 W/ft²
 - Tier III+
- New Jersey
 - Leased facility
 - 395,000 sq. ft.
 - 28 Acres
 - 5 x 20,000 Sq Ft Pods
 - 2 pods on day 1 (3rd under consideration)
 - 100 W/ft²
 - Tier III+

ITEM	NEAR LONDON	NEW JERSEY
Max White Space	70,000 Ft ² 7X 10,000 Ft ² PODS	100,000 Ft ² 5X 20,000 Ft ² PODS
Max White Space Design Capacity	Up to 300 w/Ft ² on an Individual POD Basis Subject to Maximum Site Load of 30MVA	150 w/Ft ²
Day 1 White Space Build	30,000 Ft ² 3 X 10,000 Ft ² PODS	40,000 Ft ² 2 X 20,000 Ft ² PODS
Day 1 White Space Design Capacity	100 w/Ft ²	100 w/Ft ²
Utility	2N to Site Independent Primary Substations	2N
UPS	2(N+1) per DC POD	3N/2 Block Redundant System
Mechanical UPS	2N per DC POD	Not Required for Day 1 Build
Paralleling Switchgear	2N	N Scalable to 2N
Generators	N+2 48 Hours of Fuel Storage	N+1 Scalable to N+2 48 Hours of Fuel Storage
Power Distribution units	2N (w/STS)	2N (w/STS)
Chillers	2(N+1) Central Plant 10 Minutes Thermal Storage per DC POD	N+2 Central Plant
Cooling Tower	N/A	N+2 48 Hours Condenser Water Storage
Chilled Water Pumps Condenser Water Pumps	N+1 Chilled Water Pumps per DC POD	N+2
Computer Room Air Handlers (CRAH)	2(N+1) per DC POD	N+1 per Data POD Zone





The Network - SFTI

SFTI US

- 10 Gb backbone w/ dual logical network design for resiliency
- (9) Access Center's
- (5) different ubiquitous access methods
- Approx. 1,000 client connections
- (4) Extranet Providers
- Ultra-Low latency
- 21 Market Centers
- Approx. 7 Gb of B2B traffic

SFTI EU

- 10 Gb backbone w/ dual logical network design for resiliency
- (6) Access Centers
- (5) different ubiquitous access methods
- Extranet Providers
- Ultra-Low latency (less than 1 ms in metro)

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Highest Performance Infrastructure for Traders

Market Data Technology – V5

Highest Performance Messaging Middleware – Data Fabric

Sponsored Market Access with Pre-trade Risk Management

Market Access Gateways

Time Series Databases – OneTick

Market Data Content – Superfeed, Superbook, Historical Data

Market Data Administration - DART

Summary

“TOUCH EVERY TRADE”