

# The Latest FIX Developments

**FIX**PROTOCOL  
INDUSTRY-DRIVEN MESSAGING STANDARD™





## Session Participants

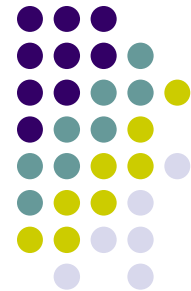
- **Scott Atwell**  
Manager, FIX Trading and Connectivity, American Century  
Co-chair, Global Steering Committee
- **Jim Northey**  
Partner LaSalle Technology Group  
Co-chair, FPL Americas Regional Committee
- **Ryan Pierce**  
FIX Technical Director, FIX Protocol Ltd.
- **Robert Stowsky**  
Director, Financial Services, Progress Software  
Co-chair Global Derivatives Technical Sub-committee
- **Lisa Taikitsadaporn**  
Managing Partner, Brook Path Partners Inc.  
Co-chair, Global Fixed Income Technical Sub-committee

# FPL Organizational Update

**FIX**PROTOCOL  
INDUSTRY-DRIVEN MESSAGING STANDARD™

Scott Atwell

Manager of FIX Trading and Connectivity  
American Century Investments  
FPL Global Steering Committee Co-Chair





# FPL Premier Member Firms



Transaction Network Services



- Actuare Software
- Aegisoft
- Afrifocus Securities
- AG Capital Nordic AB
- Agora CTVM
- AllianceBernstein
- American Century Investments
- Assimilate Technology
- Australian Stock Exchange
- B2BITS
- Baillie Gifford & Co.
- Banc of America Merrill Lynch
- Barclays Capital
- Barclays Global Investors
- Baring Asset Management
- Baxter Financial Services
- BidRoute
- Bloomberg
- BM&F BOVESPA
- BNP Paribas
- BNY ConvergeEx Group (Eze Castle Software)
- BOCI Securities
- Bon Trade Solutions
- Bond Exchange of South Africa (BESA)
- BourseTech
- BreakThrough Trading Solutions
- Brook Path Partners
- BT Global Services
- Bursa Malaysia Berhad
- Cantor Fitzgerald
- Capital Group
- Cazenove
- CBOE
- Charles River Development
- CheckFree
- Chelmer Ltd
- Chi-X
- Citi
- CL&B Capital Management
- CLSA Limited
- CMA
- CME Group
- CohesiveFT
- Commerzbank Securities
- Counterparty Systems, Inc
- Credit Suisse
- Daiwa SB Investments
- Daiwa Securities
- Datalytiqs Group
- DATAROAD

## FPL Member Firms = 199 Firms

- DBS Vickers
- Deutsche Bank (CIB)
- Deutsche Börse
- Dresdner Kleinwort
- Ecominds
- Edge Financial Technologies
- Equinix
- ETNA Software
- Excellent Solutions
- Exegy
- Extol
- EZX
- FIA (Futures Industry Association)
- Fidelity Capital Markets
- Fidelity Investments
- Fidessa
- Financial Fusion (Sybase)
- Financial Technologies (India) Ltd
- First Futures Software
- FIX Flyer
- Forex Capital Markets
- FpML
- Franklin Templeton Investments
- FTEN, Inc.
- FXall
- Gartmore
- GBM Grupo Bursatil Mexicano S.A. De C.V.
- Goldman Sachs
- Grand Total
- Greenline Financial Technologies
- HM Publishing Ltd
- HotBridge
- HSBC
- Hundsun Technologies Inc
- HYPERCUBE
- IBM
- ICAP
- ICE (Intercontinental Exchange)
- ICMA (International Capital Markets Assoc)
- IFIS Asia Pte Ltd
- innerExchange
- Instinet
- Intelcheck Services (prev eClientscope)
- IRROC
- IS Investment
- ISE (International Securities Exchange)
- IsoSoft Solutions LLC
- ITG
- JetTek
- JF Asset Management

- John Mackenzie's Holding Company
- Jordan & Jordan
- JOXO
- JP Morgan Securities
- JSE (Johannesburg Securities Exchange)
- K&K Global Consulting Ltd
- Kabu.com Securities Co., Ltd
- Knight Securities
- Koelo Technologies
- Life Dust
- Linedata Services
- Link S/A CCTVM
- Liontrust Investment Services
- Liquidnet
- London Market Systems
- London Stock Exchange Group
- Macdonald Associates
- Macquarie Securities
- MAE - Mercado Abierto Electronico
- Mantara, Inc
- Marco Polo Network
- MarketAxess
- Marketcetera
- Massachusetts Financial Services
- MEFF
- MiFID Consulting
- Mitsui Asset Trust and Banking
- Morgan Stanley
- Morgan Stanley Investment Management
- NASDAQ OMX
- National Stock Exchange of India
- NCSD Group
- NeoNet Securities
- NetQoS
- Newedge Financial
- Nikko Asset Management
- Nirvana Financial Solutions
- Nomura
- Nomura Asset Management
- NYFIX
- NYSE Euronext
- OCBC Securities
- OMG (Object Management Group)
- Omgeo
- Onix Solutions
- Options Clearing Corporation (OCC)
- Orc Software
- Pantor Engineering AB
- Patsystems
- Peresys
- PFSOFT

- PLUS Markets
- Portware
- Precision Systems Concepts
- Prediction Labs
- Primary Brokers (eTrading)
- Progress Software
- Putnam Investments
- Quadrivers, Inc
- QUICK
- Rapid Addition
- Royal Bank of Scotland (prev. ABN Amro)
- RTS Realtime Systems
- SASLA (South African Securities Lending Assoc)
- SG Securities
- Shanghai Stock Exchange
- SIFMA
- SimCorp
- Singapore Exchange (SGX)
- Smart Trade Technologies
- Solutionforge
- Stanlib Asset Management
- State Street Global Markets
- SunGard
- SWIFT
- SWX Europe
- T&M Testes de Software Ltda
- TAIFEX (Taiwan Futures Exchange)
- Tata Consulting Services
- Tbricks AB
- Teraspaces
- Tethys Technology, Inc
- The LaSalle Technology Group
- Thomson Reuters
- Tora Trading Services
- Townsend Analytics
- Tradeweb
- Trading Technologies
- TradingScreen
- Transaction Network Services
- Trayport
- Turquoise
- TWIST
- UBS Investment Bank
- Ullink
- Universal Technology E.U
- Vanso Nigeria Limited
- Versitrac Systems
- Winterflood Securities
- Wipro Technologies





## Global Highlights from the Past Year

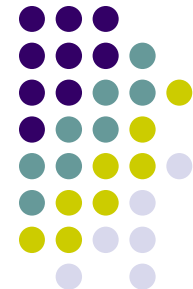
- Q3 2008
  - Emerging Market Membership Category Created
  - Statement of Understanding Signed with Object Management Group
  - Launch of FIX Algorithmic Trading Definition Language (FIXatdl) 1.1 Release Candidate 1
- Q4 2008
  - Technical Director Appointed
- Q1 2009
  - Release of FAST Protocol Version 1.2
  - Asia Pacific and EMEA Regional Directors Appointed
  - Implementation & Optimization Working Group Created
- Q2 2009
  - FPL and FISD Sign Statement of Understanding
  - FPL Announces Release of FIX 5.0 Service Pack 2
  - IIROC Announces Adoption of FIX 5.0
- In addition to the above mentioned organizations, collaborations continue with MMI, ISITC, ISO / SWIFT, FIA, FpML.
- Events held in Tokyo, London (inaugural conference), Chicago, New York, Sao Paulo, Shanghai, Sydney (inaugural conference) and this week FPL is hosting this conference and one in Hong Kong.

# FIX Protocol Version 5.0 Service Pack 2

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Ryan Pierce  
FIX Technical Director, FIX Protocol Ltd.





## FIX 5.0 Service Pack 2 – What's new?

- Consists of 19 Extension Packs, including:
  - Enhancements to identify standardized Credit Default Swaps (CDSs) for clearing
  - Enhancements to support the needs of the LSE
  - Enhancements to support the trade capture requirements of the Commodity Futures Trading Commission (CFTC)
  - Improvements to the delta position limit functionality offered by The Options Clearing Corporation (OCC)
  - New set of Parties Reference data messages set to support the dissemination of party relationships and risk limits
  - New messages to support real time pre-trade market data stream assignments by price makers when prices are distributed via third party distribution channels
  - Enhancements for identifying New York Mercantile Exchange (NYMEX) energy products and Unit Of Measure
  - Enhancements to support Foreign Exchange Non-Deliverable Forwards (NDFs)
  - Enhancements to support exotic options products



## Extension Packs and Service Packs

- Starting with FIX 5.0, FPL moved away from monolithic version releases and towards modular development based on the Repository
- An Extension Pack is a change or addition of functionality, applied cumulatively to the FIX specification
- Extension Packs are bundled together to form Service Packs, e.g. FIX 5.0 SP2
- Extension Packs are ratified and released by the GTC; users can implement them immediately



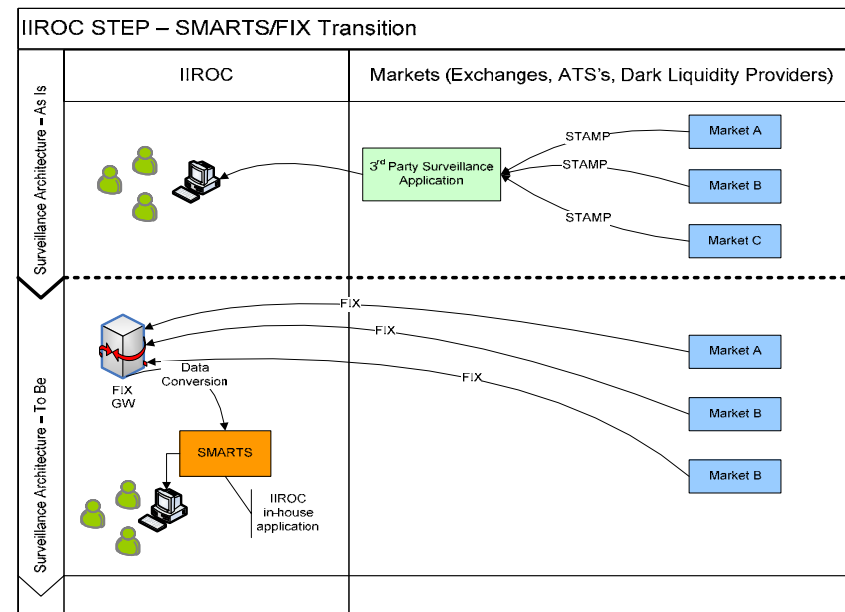
## Extension Packs Approved After FIX 5.0 SP2

- LSE – FillsGrp Yield Extension
- LSE – Matching Instruction Extension
- Thomson Reuters – FX Spot and Forward Swap Matching
- IIROC – Canadian Market Regulation Feed
- FIA – Margin Requirements



## FPL Collaboration with IIROC

- FPL and Investment Industry Regulatory Organization of Canada collaborated for nearly six months to extend FIX to support a regulatory feed for Canadian markets
- No new fields or messages were required; only additions and modifications to existing fields and messages
- An Extension Pack to FIX 5.0 SP2 was approved, released, and may be used immediately
- FPL welcomes further collaboration with Exchanges and Regulators



# FIX Algo Support



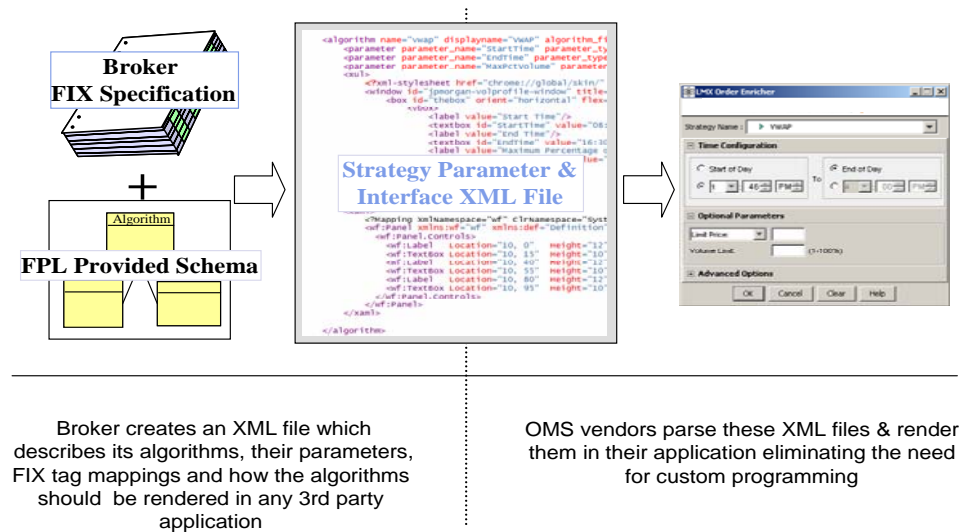
**Ryan Pierce**  
**FIX Technical Director, FIX Protocol Ltd.**





## FIXatdl in a Nutshell

- FIX Algorithmic Trading Definition Language
- XML standard to define behavior of broker algorithms in FIX
- Enables:
  - Definition of algorithms
  - Validation rules
  - Workflow rules
  - Help for parameters
  - Trading screen GUI layouts
- Benefits: Can support new algos, or changes to algos, without requiring software changes to an OMS or EMS that supports FIXatdl





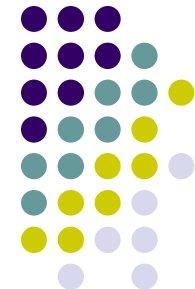
## FIXatdl Recent Developments

- FIXatdl 1.1 Release Candidate 1 to be released this week
- Early adopters of FIXatdl 1.1 RC1 include:
  - Algo providers: Barclays Capital, Merrill Lynch / Bank of America
  - Vendor support: BRTools, Jordan & Jordan, Portware, Townsend Analytics
- Early adopters and testers are needed prior to finalizing FIXatdl 1.1

**FAST 1.2**

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**Jim Northey**  
Partner LaSalle Technology Group  
Co-chair, FPL Americas Regional Committee





## Topics

- Overview of FAST version 1.0 – 1.2
- Interoperability between FAST versions
- Future standardization work



## FAST 1.0 Overview

- Minimal base implementation
- The 1.0 specification was silent on a number of aspects, so:
  - It wasn't really usable in itself
  - Consultation within mdowg necessary
  - Required strict discipline on the part of the implementor
- Some current implementations use subsets of FAST 1.0
  - Transfer encoding (e.g. no support for NULL values)
  - Field encoding (e.g. limited use of operators)
  - Message layout (e.g. copy coding of TID)



## FAST 1.1 Overview

- One Integrated Specification
- Transfer Encoding
  - Byte vector added (to support non-US ASCII strings)
  - Presence map extensions (zero or one bit per field)
- Field Encoding
  - Additional field operators / operator combinations
  - Dictionary enhancements
- Templates
  - XML-based notation to provide full expressional strength
- Session Control Protocol
  - Base specification completed



## FAST 1.2 Overview

- Incremental improvements
  - Efficiency improvements
  - Improved support for FIX over FAST
- Based on feedback from implementors
  - Only proposals from implementors were considered
- Composite field type
  - Combines multiple application fields into one FAST field
  - Enables further compaction of data
- Additional data types
  - Enumeration, Set, Timestamp, Boolean



## FAST 1.0 – 1.1 Interoperability

- The 1.1 specification is more complete, but:
  - Implementation guidelines are needed
  - Mdwg interaction and consultation still an advantage
  - Strict discipline still required
- Subsetting must be done with care
  - Transfer encoding should be fully implemented
  - Limited field encoding may increase costs later
- A few full FAST 1.1 implementations available
- Several subset implementations in use
  - A few exchanges and several vendors
  - Minimal information exchange and implementation review



## FAST 1.1 – 1.2 Interoperability

- FAST 1.2 maintains full compatibility with FAST 1.1
  - 1.2 doesn't introduce any wire format changes
  - FAST 1.2 streams can be read by a 1.1 decoder
  - Straight-forward implementation



## FAST 1.2 Performance

- Improved encoding and decoding speed
  - Primarily due to new more efficient data types
  - New features map well into hardware
- Improved compression efficiency
  - 15% improvement demonstrated in one production feed
- Ability to express additional data patterns
  - More efficient data types
  - Composite fields



## Conclusions

- FAST 1.2 offers incremental improvements
  - Backward compatible with FAST 1.1
  - Additional support for FIX over FAST
  - Efficiency improvements
- Future standardization
  - Compatible
  - Optional
  - Incremental

## FIX Support for Other Asset Classes

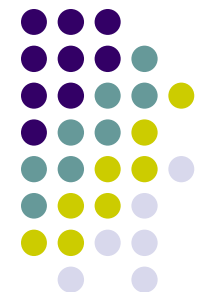


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# FIX Support for Equities and Derivatives

Message Support	FIX Version							
	4.0	4.1	4.2	4.3	4.4	5.0	5.0 SP1	5.0 SP2
<b>Equities</b>								
Basic Order Flow	Good	Good	Good	Good	Good	Good	Good	Good
IOI's and Advertisements	Good	Good	Good	Good	Good	Good	Good	Good
Quotes	Good	Good	Good	Good	Good	Good	Good	Good
Market Data	No	No	Good	Good	Good	Good	Good	Good
Allocations	Some	Some	Good	Good	Good	Good	Good	Good
Confirmations/Affirmations	No	No	No	No	Good	Good	Good	Good
Trade Reporting	No	No	No	Some	Good	Good	Good	Good
Program Trading	Some	Some	Good	Good	Good	Good	Good	Good
Algorithmic Trading	Some	Some	Some	Some	Good	Good	Good	Good
<b>Futures and Options</b>								
Basic Order Flow	No	Some	Good	Good	Good	Good	Good	Good
Multi-leg Order Flow	No	No	Some	Good	Good	Good	Good	Good
IOI's and Advertisements	Some	Good	Good	Good	Good	Good	Good	Good
Quotes	No	Some	Good	Good	Good	Good	Good	Good
Market Data	No	No	Good	Good	Good	Good	Good	Good
Allocations	No	Some	Good	Good	Good	Good	Good	Good
Confirmations/Affirmations	No	No	No	No	Good	Good	Good	Good
Trade Reporting	No	No	No	Some	Good	Good	Good	Good
Security & Position Reporting	No	No	No	No	Good	Good	Good	Good
Collateral Management (Listed Derivatives)	No	No	No	No	Good	Good	Good	Good

<b>Legend</b>	No Support	Some Support	Good Support	Not Applicable
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NOTE: levels of support are based on fields incorporated into the core protocol at a given stage. This rating does not include custom fields, which can be added to earlier versions of the protocol to achieve given functionality.



# FIX Support for Fixed Income and Foreign Exchange

Message Support	FIX Version							
	4.0	4.1	4.2	4.3	4.4	5.0	5.0 SP1	5.0 SP2
<b>Fixed Income</b>								
Basic Order Flow	Red	Red	Yellow	Green	Green	Green	Green	Green
Multi-Leg Order Flow (Repos, Swaps, Switches, Rolls)	Red	Red	Red	Yellow	Green	Green	Green	Green
IOI's (Offerings)	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green
Quotes	Red	Yellow	Yellow	Green	Green	Green	Green	Green
Allocations	Red	Yellow	Yellow	Green	Green	Green	Green	Green
Confirmations/Affirmations	Red	Red	Red	Red	Green	Green	Green	Green
Trade Reporting	Red	Red	Red	Yellow	Green	Green	Green	Green
Collateral Management	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow
<b>Foreign Exchange</b>								
Basic Order Flow (Spots, Forwards)	Red	Yellow	Green	Green	Green	Green	Green	Green
Basic Order Flow (Swaps)	Red	Yellow	Yellow	Yellow	Yellow	Green	Green	Green
Quotes (spots, outright forwards, FX swaps)	Red	Yellow	Green	Green	Green	Green	Green	Green
Market Data (executable streaming prices)	Red	Yellow	Yellow	Yellow	Yellow	Green	Green	Green
Allocations	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Confirmations/Affirmations	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow
Trade Reporting	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow

<b>Legend</b>	<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span> No Support	<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> Some Support	<span style="display:inline-block; width:15px; height:15px; background-color:green;"></span> Good Support	<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span> Not Applicable
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NOTE: levels of support are based on fields incorporated into the core protocol at a given stage. This rating does not include custom fields, which can be added to earlier versions of the protocol to achieve given functionality.



# FIX Markets and General Support

Message Support	FIX Version							
	4.0	4.1	4.2	4.3	4.4	5.0	5.0 SP1	5.0 SP2
<b>Exchanges and Markets</b>								
Market Data (Including Price Dissemination)	Red	Red	Green	Green	Green	Green	Green	Green
Reference Data (Instruments and Products)	Red	Red	Yellow	Yellow	Green	Green	Green	Green
Parties Reference	Red	Red	Red	Red	Red	Red	Red	Green
Market Structure	Red	Red	Red	Red	Red	Red	Green	Green
Quote Driven Markets	Red	Red	Green	Green	Green	Green	Green	Green
Order Driven Markets	Green	Green	Green	Green	Green	Green	Green	Green
OTC derivatives trading and clearing	Red	Red	Red	Red	Red	Red	Yellow	Green
<b>General</b>								
News	Green	Green	Green	Green	Green	Green	Green	Green
Email	Green	Green	Green	Green	Green	Green	Green	Green
Transport Independence Framework	Blue	Blue	Blue	Blue	Blue	Green	Green	Green
Regulatory Compliance (MiFID, Reg NMS, Reg SHO, OATS, ACT, NYSE 80A)	Blue	Blue	Blue	Blue	Blue	Green	Green	Green

<b>Legend</b>	 No Support	 Some Support	 Good Support	 Not Applicable
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NOTE: levels of support are based on fields incorporated into the core protocol at a given stage. This rating does not include custom fields, which can be added to earlier versions of the protocol to achieve given functionality.



## Fixed Income

- FIX 4.4 - released in 2003
- Collaboration with The Bond Market Association (now SIFMA)
- Treasuries, Agencies, Municipals, TBA Mortgages, Corporates, Commercial Paper, Repurchase Agreements and Security Lending transactions
- Contributed to major enhancements in Allocations messages and addition of Confirmation messages
- Negotiation workflow introduced
- Prominent adopters:
  - TradeWeb
  - Bloomberg
  - MarketAxess
  - Major fund managers and buy-side OMS vendors
- Prominent in post-trade processes



## Foreign Exchange

- **FIX 5.0**
  - Full treatment of FX as an asset class
  - Spot, Forwards, FX Swaps, vanilla FX OTC Spot Options
  - Streaming executable prices with price/volume banding
  - Quote message set enhancements
  - Support for tenor expressions
- **FIX 5.0 SP1**
  - Added non-deliverable forwards (NDFs)
- **FIX 5.0 SP2**
  - Added support for price stream assignment messages

# FPL's Collaboration with other Standard Organizations

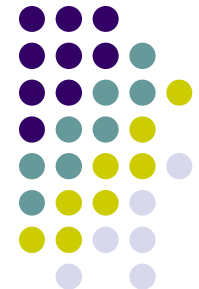


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## Other Standard Organizations

- ISO 20022
  - In collaboration with SWIFT Standards
  - Reverse engineering of FIX message and business models into ISO 20022
  - FPL provides technical resources to assist with the reverse engineering
  - Objective: to have a single common business model that is an ISO standard for securities transactions and reference data
- ISITC
  - Community of experts in securities operations
  - Sets and documents market best practices
- FpML/ISDA
  - FIX/FpML Collaboration WG
- FISD
  - Collaborating to set best practices in the areas of reference and market data standards



# Investment Roadmap FIX, ISO, FpML syntax (HIGH LEVEL)

	Cash Equities & Fixed Income	Forex <sup>(2)</sup>	Listed Derivatives	OTC Derivatives <sup>(2)</sup>	Funds
Pre-Trade	FIX	FIX	FIX	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Trade	FIX	FIX	FIX	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Post-Trade	FIX, ISO	FIX, ISO	FIX, ISO	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Clearing / Pre-Settlement	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>	FIX, ISO	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Asset Servicing	ISO <sup>(1)</sup>	N/A	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Settlement	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>	ISO <sup>(1)</sup>
Pricing / Risk / Reporting	ISO, FpML	ISO, FpML	ISO, FpML	ISO, FpML	ISO, FpML



(1) Represents ISO 20022, ISO 15022 and SWIFT MT messages

(2) See OTC Derivatives breakout for details:

- Syndicated Loans, Privately Negotiated FX, and OTC Equity, Interest Rate, Credit, and Commodity Derivatives
- FpML payload may be used in combination with FIX business processes in dealer to buy side communication

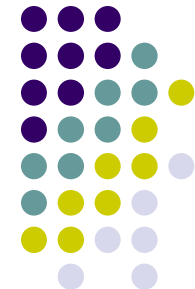
## Post-trade Models



Lisa Taikitsadaporn

Managing Partner, Brook Path Partners Inc.

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## Post-trade Allocation Models

- Local matching
- Central matching
- Clearinghouse



## Local Matching

- Between buy-side (e.g. fund manager) and sell-side broker/dealer
- Completion of trade via use Order and Execution Report or "notice of execution"
- Many workflow models can be supported via FIX



## Local Matching Example

Buy-side initiated without calculated fees (equity)

Buy-side	→	Allocation Instruction (AllocType=" Preliminary", AllocAccounts provided without MiscFees or NetMoney)	Sell-side
	←	Allocation Instruction Ack (AllocStatus=Received Not Yet Processed)	
	←	Allocation Instruction ACK (AllocStatus=Accepted)	

Source: FIX Protocol Spec

Confirmation/Affirmation process follows



## Local Matching Example

Sell-side initiated with fees calculated

Buy-side	←	Allocation Report (AllocReportType="Sellside Calculated without Preliminary")	Sell-side
	→	Allocation Report Ack (AllocStatus=Received Not Yet Processed)	
	→	Allocation Report Ack (AllocStatus=Accepted)	

Source: FIX Protocol Spec

Confirmation/Affirmation process follows



## Local Matching Example

Fixed Income model

Buy-side	→	Allocation Instruction (AllocType=" Preliminary", AllocAccounts provided without MiscFees or NetMoney)	Sell-side
	←	Allocation Instruction Ack (AllocStatus=Received Not Yet Processed)	
	←	Allocation Report (AllocTransType = 0 (New) and AllocReportType = 3 (Sellside Calculated Using Preliminary (includes NetMoney calculations)))	
	→	Allocation Report Ack (AllocStatus = 3 (Received, not yet processed))	
	→	Alloc Report Ack (AllocStatus = 0 (Accepted))	

Source: FIX Protocol Spec

Confirmation/Affirmation process follows



## Confirmation/Affirmation

Buy-side	←	Confirmation, (ConfirmType = "2" [Confirm], CopyMsgIndicator = "N", ConfirmTransType = "New", ConfirmStatus = "Confirmed")	Sell-side
	→	Confirmation Ack (AffirmStatus = "Received")	
	→	Confirmation Ack (AffirmStatus = "Affirmed")	

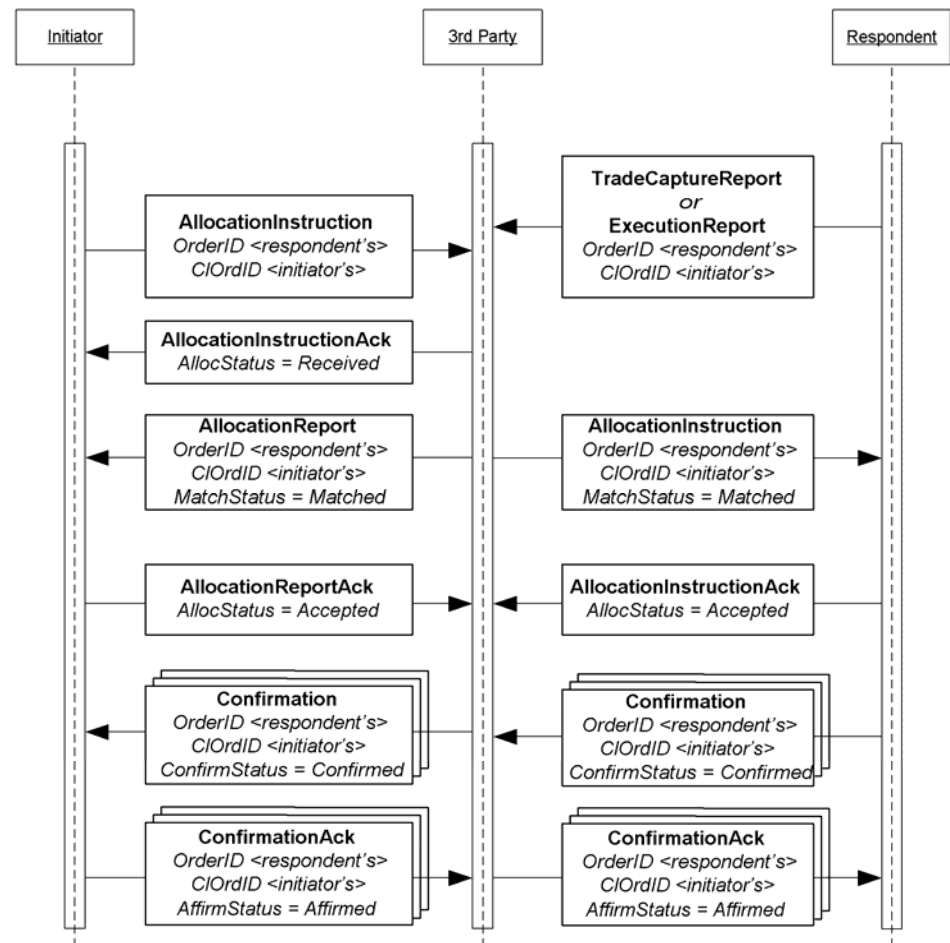
Source: FIX Protocol Spec

Once affirmed by buy-side, the account is ready to settle



## Central Matching

- Between buy-side (e.g. fund manager) and sell-side broker/dealer via a central matching service/utility
- Completion of trade via use Order and Execution Report or "notice of execution"
- Example flow:





# Clearinghouse Workflow

