CME GROUP CUSTOMER FORUM

November 2019
Agenda

1. CME Specific Topics
   - iLink 3 Update
   - Reminder on Tag 1031
   - Smart Stream via Cloud Link on GCP
   - Bitcoin Update
   - SOFR Options Launch

2. BrokerTec Stream Update & RV Curve
3. BrokerTec US & EU Integration with CME Globex
4. EBS Integration with Globex
iLink 3 Binary Order Entry: Summary


Simple Binary Encoding

• Provides more efficient delivery of order entry messaging; faster encoding/decoding
• Standard message size, fixed positions and fixed length fields

FIX Performance (FIXP) Protocol

• New session layer to establish and maintain connectivity between customers and CME Globex
• Lean messages moves administrative information out of critical path for order entry
• Improved performance and simplicity
iLink 3 : Business Messages

Optimized Business Semantics

- More efficient messages, ability to remove administrative information from the order entry path
- Administrative information includes:
  - Account, Account Type, SenderComp, CTI Code and Self-Match Prevention
- Two forms of submitting administrative information:
  1. Pre-registered administrative information
     - Customers pre-register administrative information in the new Service Gateway weekly
     - Omit from order entry by using tag 1505-PartyDetailsListReqID to reference the registered information
  2. On-demand administrative information
     - Customers send the administrative information to the Market Segment Gateway (MSGW) with every business message (New Order Single, Mass Quote, etc.), and use tag 1505-PartyDetailsListReqID = 0
- Drop Copy messages will have full details of both the administrative and business information
iLink 3 Binary Order Entry: Schema Update

New Schema Release: Version 2

Addition of new fields to the body or repeating group of a message without changing the Template ID

• Message enhancements for BrokerTec Markets
  - Security Definition Request and Response – new template IDs, old IDs removed
  - PartyDetailsDefinitionRequest and PartyDetailsDefinitionRequestAck
  - New ExecutionAck template for bilateral trade reject
  - New fields for MiFID reporting

• NULL value to the following data types:
  - uInt64NULL
  - Decimal64NULL

• Added PossRetransFlag (9765) to MassQuoteAck, OrderMassActionReport, QuoteCancelAck and RequestForQuoteAck
New Release Environment

- **Available Now** - Majority of iLink 3 functionality to start the customer testing window
  - e.g. FIXP, Order/Modify/Cancel, Pre-registered administrative messages
- **November 25**
  - All remaining iLink 3 functionality (e.g. Mass Quotes, RFC, RFQ, On-demand administrative messages)
- **January 2020 AC+ Certification test suite available**

Production Environment

- **Production launch** will be rolled out starting **March 29, 2020** through **May 17, 2020**, over 4 launch weekends.
- **Production parallel**: Support both iLink 2.0 & 3.0 MSGW sessions for 6 months after the final launch weekend
- **Customer mock trading sessions** will be held prior to the launch in production environment
  - Must be certified for iLink 3 to participate
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Reminder: Tag 1031-CustOrderHandling

• Collaboration with FIA to provide trading and clearing firms a more effective means to reconcile executing broker fees

• Tag 1031 will be validated for presence and values on all iLink 2 business messages; iLink 3 will include and validate in the party details administrative message.
  - W - Desk
  - Y - Electronic
  - C - Vendor-provided planform
  - G – Sponsored Access via Exchange API
  - H – Premium Algo Trading Provider
  - D – Others

• Validation Launch:
  - FIA white paper available now!
  - New Release – August 26, 2019
  - Production – November 17, 2019

• iLink messages without 1031 or with an invalid value will be rejected

• CME Group recommends you update your GTC and GTD orders now – no impact to priority!
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CME Smart Stream on GCP

CME SBE Market Data Globally Available in All GCP Regions

• Access CME Group market data through the new CME Smart Stream via Google Cloud Platform (GCP)

• MDP 3.0 Channels, Streamlined, Data Insights and BrokerTec US Treasury data available

• Key Benefits
  - Real-time market data
  - Leverages existing CME Group Simple Binary Encoded (SBE) data formats
  - Google Pub/Sub Transport to all 19 Google Regions
  - Provides low cost on-demand, pay as you go model
  - No long-term commitment – quickly turn access up or down as needed
  - No need to provision servers, install network or manage infrastructure
  - Lower costs for existing, day-to-day operational processes, like Dev, QA, settlements, etc
  - Easy onboarding for new customers

• Signed ILA and certification required

• New Release: Available

• Production Launch: November 17, 2019
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Strong Growth in Bitcoin Futures
In 2019, 6,980 ADV (34,450 eq. BTC; $260M notional), +96% YoY

- Over 3,400 global accounts have begun trading BTC futures since launch
- CAGR: ~200% annual growth rate on ADV
- Average daily OI 4,382 contracts (~22k equivalent bitcoin), an increase of 92.5% higher over 2018 (through Q3)
- Additionally, the average number of LOIHs (Large Open Interest Holders) during Q3 2019 reached a record high of 47 holders, 38% higher than Q3 2018
- Markets are liquid ~24 hours a day, with volume spread out across the trading day. 51% of volume occurs before the U.S. trading day begins in 2019
- Due to increased client adoption of our existing bitcoin futures and growing demand for additional hedging tools, CME will launch European style Options on BTC Futures* on January 13, 2020

*Pending Regulatory Approval
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SOFR Futures Liquidity Developments

SOFR Futures at a glance

- **Open Interest**: 508K+ contracts ($1.9 trillion notional equiv.)
- **Average Daily Volume**: 44K contracts ($137B notional)
- **Participants**: Since launch, 300+ global firms including banks, asset managers, hedge funds, and proprietary trading firms.

<table>
<thead>
<tr>
<th>3-Month SOFR Futures</th>
<th>1-Month SOFR Futures</th>
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<tbody>
<tr>
<td><strong>Contract Unit</strong></td>
<td>Compounded daily interest during contract Reference Quarter</td>
</tr>
<tr>
<td><strong>Contract Size</strong></td>
<td>$25 per basis point per annum</td>
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<tr>
<td><strong>CME Globex Symbol</strong></td>
<td>SR3</td>
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<tr>
<td><strong>Bloomberg Symbol</strong></td>
<td>SFR</td>
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SOFR Options Launch

January 6th, 2020

CME Group will launch options on 3-Month SOFR futures for first trade date January 6, 2020

• CME SOFR Options as the first options (non-linear) product will further assist with the market’s adoption of SOFR as the alternative reference rate, and in its’ usefulness as a Treasury Repo Index

• Client feedback during 3-Month SOFR options validation;
  - Eurodollar options are essentially perfect and no reason to deviate from design
  - With open interest across multiple years and expirations it was suggested we fully replicate ED options suite to let market get familiar and build strategies

• Listings and contract design will closely mimic deeply liquid Eurodollar and Mid Curve options
  - Listing rules, strike increments and price increments will be identical to the current options on ED futures
  - CME SOFR options will be available to trade in all venues; Open Outcry, Globex, and Clearport for Blocks

• Capital Efficiencies: Eurodollar Options will have margin offsets with SOFR Options
• Operational Efficiencies: CME will provide ICS between ED and SOFR Options on Globex

### Eurodollar Options

<table>
<thead>
<tr>
<th>Year</th>
<th>Open Interest by Expiry</th>
<th>As of Oct. 8th</th>
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<tbody>
<tr>
<td>Year 1 – White</td>
<td>33,305,442</td>
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<tr>
<td>Year 2 – Red</td>
<td>8,244,044</td>
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<tr>
<td>Year 3 – Green</td>
<td>2,054,024</td>
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<tr>
<td>Year 4 – Blue</td>
<td>13,105</td>
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<tr>
<td>Mid Curves*</td>
<td>12,978,569</td>
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<tr>
<td>Total</td>
<td>56,595,184</td>
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</table>

*Expirations under 15 months