

ICE CLEAR EUROPE

CDS CLIENT CLEARING

2019



AGENDA

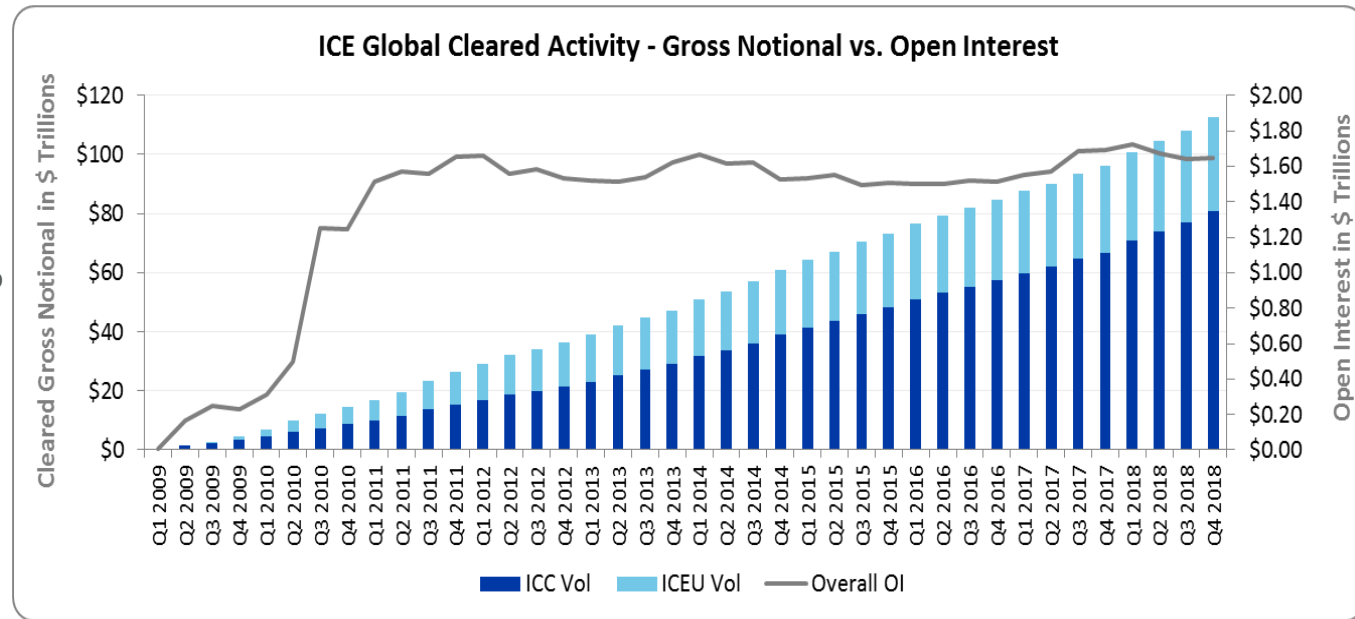
- OTC CDS Clearing Overview
- CDS Client Clearing Model Overview
 - Client Clearing Overview
 - Risk Management
 - CDS Connectivity and ATF Trade Workflow
 - Client Clearing Tools
- Appendix

ICE CDS CLEARING

THE MARKET LEADER IN CLEARED ACTIVITY

Intercontinental Exchange Group (ICE) is the leading network of regulated Exchanges and Clearing Houses for financial and commodity markets. ICE delivers transparent, reliable and accessible data, technology and risk management services to markets around the world through its portfolio of exchanges, including the New York Stock Exchange and ICE Futures.

- Global leader in OTC credit as well as listed derivatives in credit indices, interest rates, equity, energy, agriculture and foreign exchange
- March 2009 - ICE is the first to clear index credit default swaps (CDS)
- July 2009 – ICE Clearing Europe launches CDS clearing
- December 2009 – ICE is the first to clearing single name credit default swaps and client activity



ICE CDS EXPERTISE

- Global leader in CDS with expertise in execution, post-trade processing, clearing and other operational and risk management processes
- Open platform architecture – each process is available individually and can connect to multiple alternative service providers
- Integrated ICE CDS solution offers an easier, more efficient execution and processing experience

EXECUTION

- ICE's SEF, ICE Swap Trade, offers all-all anonymous execution leveraging its highly successful existing technology platform. Coupled with ICE's non-SEF execution, market participants are offered a singular view of the credit market
- Innovative CDS electronic services: credit event auctions, delta neutral auctions and portfolio compression

PROCESSING

- ICE Link; the leading post trade affirmation service for CDS
- Connected to over 1200 CDS buy-side firms in addition to all major dealers, clearing brokers, IDBs, ATFs and SDRs
- Helps clients meet new regulatory requirements for automation and standardization

CLEARING

- ICE Clear Credit (formerly ICE Trust) launched March 2009, the first clearing house to process CDS transactions
- ICE Clear Europe launched CDS Clearing July 2009

GLOBAL CDS PRODUCT SCOPE

ICE CLEAR CREDIT PRODUCT COVERAGE:

CDX

- IG – Series 12+
- HY – Series 22+
- EM – Series 21+

iTraxx

- Main – Series 11+
- Xover – Series 21+
- HiVol – Series 19-20
- Snr Fins – Series 21+
- Sub Fins – Series 22+
- Asia Ex-Japan – Series 24+
- Australia – Series 24+

Corporates

- 255 North American
- 207 European
- 8 Australian
- 9 Asia Pacific & Emerging Market

Sovereigns

- 17 EMEA Sovs
- 22 LatAM Sovs
- 7 Asia Pacific

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- Snr Fins – Series 21+
- Sub Fins – Series 22+

Corporates

- 194 European

Sovereigns

- 7 EMEA Sovs

A full listing of clearing eligible products can be found at theice.com/clear-credit (ICE Clear Credit) & theice.com/clear-europe/cds (ICE Clear Europe)

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CDS CLIENT CLEARING MODEL OVERVIEW

CDS Product

- Standard coupons, adherence to ISDA DC on credit and succession events
- Upfront fees netted with margin movements
- Ability to retain individual trades or benefit from operational netting

Customer Protections

- Multiple levels of segregation available across omnibus and individually segregated accounts
- All customer accounts are gross margined

Risk Management

- Specifically designed for CDS
- Guaranty Fund covers simultaneous default of 2 largest Clearing Members
- EOD settlement process based on price submissions subject to execution ensuring fidelity of quotes

Margin Methodology

- Dynamic Stress-Based Regime
- Margin Calculator provides transparency and detailed analysis of requirements
- Portfolio margining methodology (Index Decomposition) to provide capital efficiencies

Infrastructure

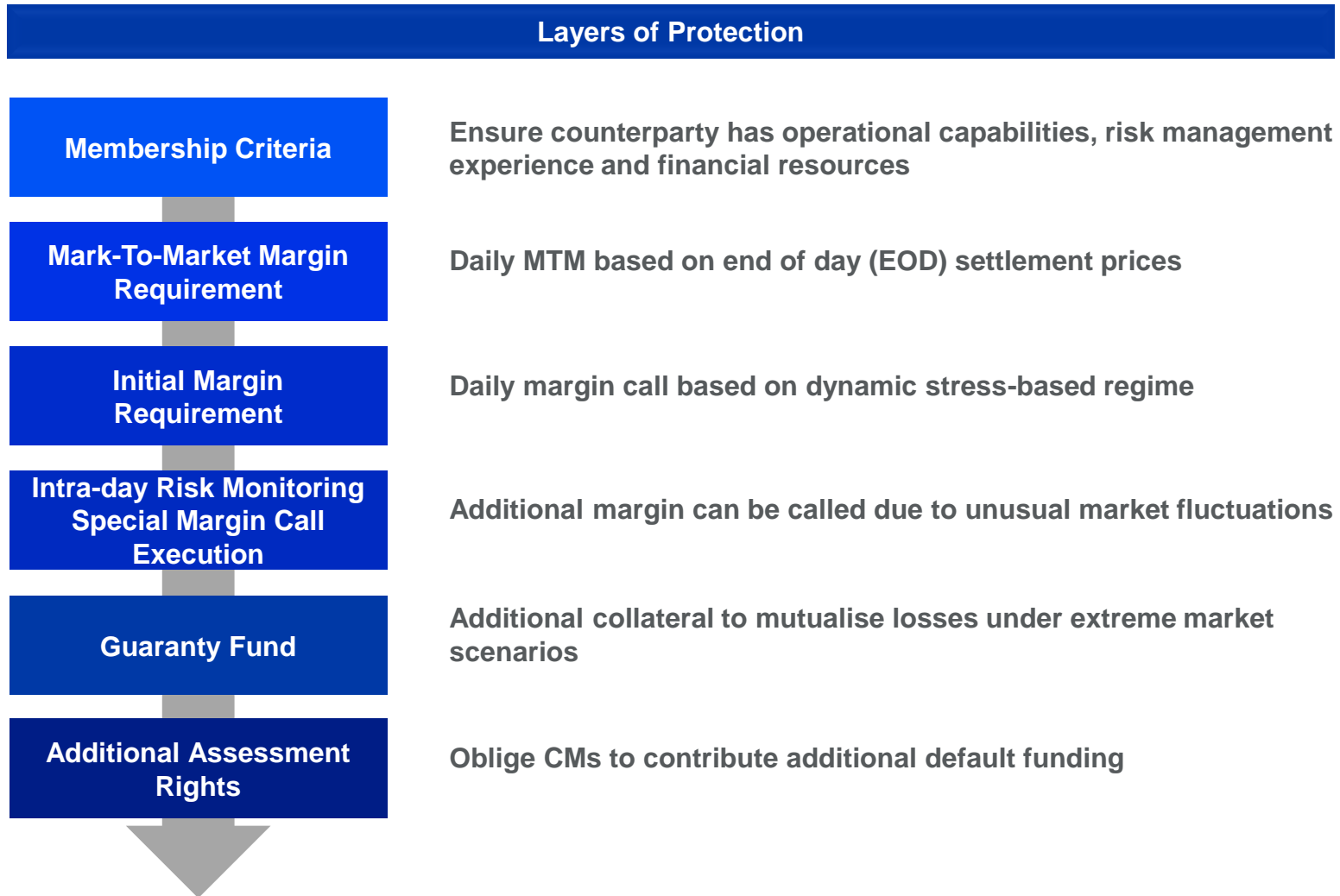
- Open Access: supporting multiple ATF execution and middleware providers
- Trades cleared intra-day, on a near real-time basis
- Allows users to leverage existing infrastructure – no costly technology build
- Supports all trade life cycle events: backloading, netting, portability, credit events

Customer Documentation

- Client relationship to Clearing Member governed by the CDS Standard Terms Annex in the ICE Clear Europe Clearing Rules
- No additional ICE Clear Europe documentation for Client and Clearing Member to bilaterally execute

ICE CDS RISK MANAGEMENT FRAMEWORK

WATERFALL APPROACH FOR MANAGING SYSTEMIC RISK



ICEU RISK: INITIAL MARGIN REQUIREMENTS

DYNAMIC STRESS-BASED REGIME

Component	Risk Captured	Approach
+ Spread Response Requirement	<ul style="list-style-type: none"> Instrument spread level variability and changes in credit spread term structure (“curve”) shape 	<ul style="list-style-type: none"> Consider six scenarios <ul style="list-style-type: none"> – Widening / contracting credit spread scenarios – 3 curve shapes per credit spread scenario
+ Recovery Rate Sensitivity Requirement	<ul style="list-style-type: none"> Fluctuations of Recovery Rate (RR) assumptions 	<ul style="list-style-type: none"> Consider min. and max. reference entity specific RR to determine additional losses
+ Jump-To-Default Requirement	<ul style="list-style-type: none"> Unexpected credit event losses not accounted for in the market valuation of Single Name (SN) instruments 	<ul style="list-style-type: none"> Include Loss-Given-Default for sold protection Consider liability associated with 1 credit event using an assumed SN-specific minimum RR
+ Basis Risk Requirement	<ul style="list-style-type: none"> Differences in trading behavior of index-derived and outright SN positions 	<ul style="list-style-type: none"> Account for liquidity differences (market views are priced into more liquid index instruments sooner than SNs), and expected cash flow differences
+ Liquidity Requirement	<ul style="list-style-type: none"> Transaction (bid-offer) costs associated with unwinding CDS instruments in the event of a Clearing Participant default 	<ul style="list-style-type: none"> Capture the proper liquidation cost for directional as well as well-hedged portfolios Estimate costs based on bid-offer width, derived from the end of day price discovery process
+ Interest Rate Sensitivity Requirement	<ul style="list-style-type: none"> Fluctuations in interest rates 	<ul style="list-style-type: none"> Assess sensitivity of portfolio Net Asset Value to default-free discount interest rate changes
+ Concentration Requirement	<ul style="list-style-type: none"> Costs associated with large position liquidation 	<ul style="list-style-type: none"> Reflect market depth and liquidity Apply to positions that exceed pre-specified thresholds
= Initial Margin Requirement		<ul style="list-style-type: none"> Increase requirements exponentially

PORTFOLIO MARGINING - QUANTIFYING THE BENEFITS

INDEX DECOMPOSITION MARGIN METHODOLOGY

Portfolio Margining Example

- ICE has formulated an *index decomposition margin methodology* which provides benefits to long/short index and single name positions
- Capital efficiencies are achieved by allowing market participants to clear index and single name CDS in a single segregated CFTC customer account while maintaining strong risk management protections
- Voluntarily clearing single names will allow you to achieve these margin benefits against mandatorily cleared indices

	Margin Requirement	Portfolio Size	Total Requirement
125 SN Positions (Bought Protection on 125 names of \$4MM each 5Y tenor)	1.25%	\$500MM	\$6.25MM
Index Position IG Series 26 5Y (Sold Protection on \$500mm)	2.00%	\$500MM	\$10.0MM
Index Arb (Bought SN/Sold Index)	0.50%	\$1,000MM	\$5.0mm









Margin Requirements	
If margined on a separate basis	Margined on a portfolio basis
\$16.25MM	\$5.00MM

- Margin reduction of \$11.25MM achieved through portfolio margining

ICE CREDIT EXPERTISE SUPPORTING AN EVOLVING MARKET


SIGNIFICANT ASSETS ACROSS ENTIRE CREDIT SPECTRUM: CDS, CASH BONDS, ABS, LOANS, CREDIT FUTURES

TRADING & AUCTIONS


-  **ICE** BondPoint™
-  **ICE** Credit Trade
-  **creditex**
-  **ICE** TMC Bonds
-  **ICE** ETF Hub
-  **ICE** Swap Trade®
-  **NYSE** Bonds
-  **ICE** Futures U.S.®
Eris Credit Index Futures




VALUATIONS & PRICING

-  **ICE** Data Services™ CMA


REF DATA & CORPORATE ACTIONS

-  **ICE** Data Services™

SWAP RISK & RATE BENCHMARKS

-  **ICE** Benchmark Administration™

BEST EXECUTION & LIQUIDITY SCORES

-  **ICE** Data Services™



TRADE PROCESSING

-  **ICE** Link™

TRADE REGULATORY REPORTING

-  **ICE** Trade Vault®

CENTRAL CLEARING

-  **ICE** Clear Credit™
-  **ICE** Clear Europe®

OVERVIEW OF ICE CDS EOD SETTLEMENT PROCESS

ESTABLISHES RELIABLE END-OF-DAY VALUATIONS FOR MARGIN/RISK CALCULATIONS

Quote Submission

- ICE requires CMs to submit quotes for 9 benchmark tenors and all standard coupons cleared by ICE for which the CM has a cleared interest

End Of Day Valuation

- Using the submitted quotes, ICE performs an end-of-day valuation for every cleared instrument using a multi-stage crossing/matching algorithm
- EOD prices for non-benchmark tenors interpolated from calculated Settlement Prices for benchmark tenors

Firm Trade Obligation

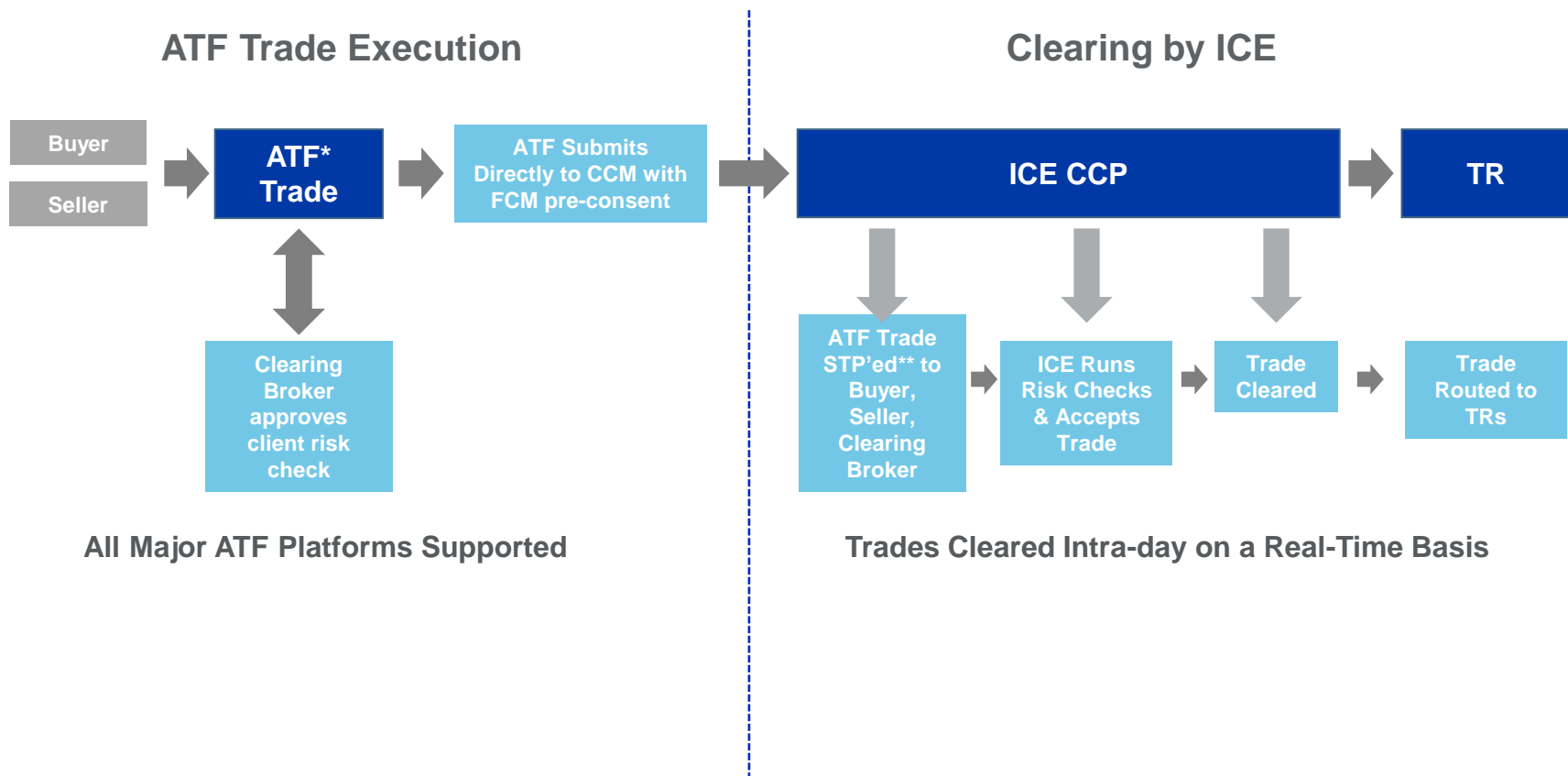
- To encourage the best possible submissions, ICE requires Clearing Members to enter into bilateral Firm Trades if submitted quotes are crossed/locked

Controls to Limit Impact on Risk

- Controls ensure that Firm Trades do not have adverse market impact
- “Default” bid offer width (default spread width)
- Fixed notional size

CDS ATF TRADE WORKFLOW

ICE SUPPORTS ALL MAJOR ATF PLATFORMS VIA THE ATF DIRECT WORKFLOW



* Authorized Trading Facilities ("ATF") including SEFs, MTFs and OTFs
** ICE Link optionally STP's ATF Trade submission and optionally Trade Repositories reports the RT/PET message for ATF

CLIENT CLEARING TOOLS

CDS MARGIN CALCULATOR

- Available to all clients through the ICE Link GUI
- Provides full transparency into our CDS initial margin methodology with results broken down by component
- Run what-if scenarios on existing positions or custom portfolios

Select existing positions in the ICE Link Positions Blotter and click on "Margin"

Ability to upload custom portfolios directly into Calculator

Review Margin Results / Export in CSV format

Transactions: Novate, Terminate, Super Block, FCM Backload, **Margin**

Description	Trade Date	Notional(MM)	BPS	Term
CDX-NAIGS16V1-5Y	01-Nov-2011	125 USD	100	Jun 16
CDX-NAIGS15V1-5Y	12-Jun-2011	125 USD	100	Dec 15
CDX-NAIGHVOLS14V1-...	12-Jun-2011	1 USD	100	Jun 15

Clearing House: ICE Clear Credit LLC
 FCM Institution: Product Management Prime Brokerage SO
 FCM Legal Entity: Product Mgt FCM [pm_fcm]
 Simulation:
 Include Cleared Trades from Previous Day's Close:
 Include Cleared Trades from Today's activity:

Upload

Portfolio		Initial Margin		Initial Margin Requirement Components									
My Acct Name	Cpty Acct Name	Net Notional	Gross Notional	Total Requirement	IM % of Gross	Spread Response (SR)			Basis Risk	Portfolio Jump to Default	Liquidity	Concentration	Interest Rate Sensitivity
						SR With Decomp Benefits	SR with Decomp and Hedge Benefits	Final SR					
Product Management Buyside Fund1	Product Mgt FCM	(489,500,000)	539,500,000	8,244,324 USD	1.53%	(7,040,248)	(7,054,888)	(7,054,888)	0	(542,891)	(617,947)	0	(28,798)

Click Here for ICE Link Clearing Margin Simulation Guide
 Margin Calculator Position Upload File Format

Export | Email | Close

Training materials available on ICE Link Web GUI (Help Documents) or at www.theice.com/clearcredit
 Contact ICE for a demonstration: icelinkhelp@theice.com or call +1 770 738 2101 / +44 (0)20 7488 5100

CLIENT CLEARING TOOLS

CDS REPORTS

REPORT	DESCRIPTION	FORMAT	AVAILABILITY*
Clearing Eligible Instruments	A full list of indices and single names eligible for clearing; includes ICE Clear Credit and ICE Clear Europe eligible instruments	CSV	Daily
Clearing Activity	Provided at allocated trade level; includes new trades cleared on a specific day	CSV and PDF	Daily
Cleared Positions	Provided at allocated trade level; includes all open cleared positions from current day in a per trade format	CSV and PDF	Daily
Gross Margin	Provides the portfolio level margin requirements (initial margin and mark-to-market)	CSV and PDF	Daily
Early EOD Pricing file	Provides end-of-day closing clearing house prices. Available at 5 pm local time.	CSV	Daily
Mark-to-Market Margin Interest Report	Provides the daily interest earned on margin collateral using the MTM balances	CSV and PDF	Daily
Netting	Provides netting results for accounts set to net; includes terminations and new net trades	CSV	Daily / Ad hoc / Selective

- All reports available in production and test environments for ICE Clear Credit and ICE Clear Europe.
- Available at 9 pm local time (except for the EOD pricing file which is available at 5pm and 8 pm local); NY for ICE Clear Credit and LDN for ICE Clear Europe
- Access through the ICE Link web interface or electronically via secure MFT

CLIENT NEXT STEPS

- To begin clearing CDS, Clients need to:
 - Establish relationships with one or more ICE CDS Clearing Members and execute legal documentation
 - Establish connectivity
- For more information, please contact us:

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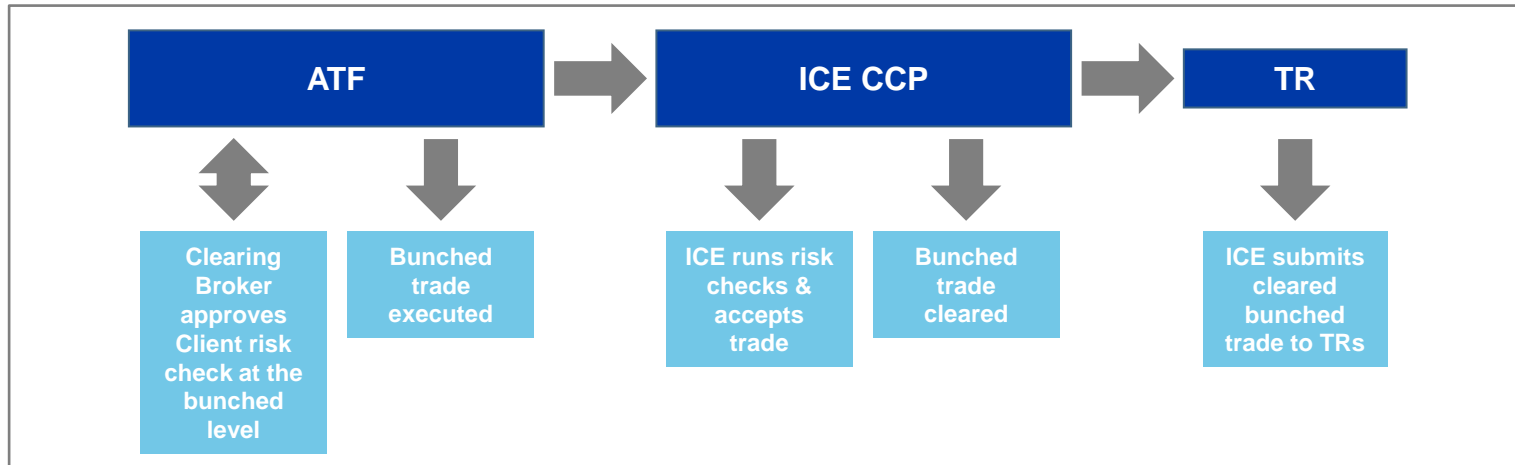
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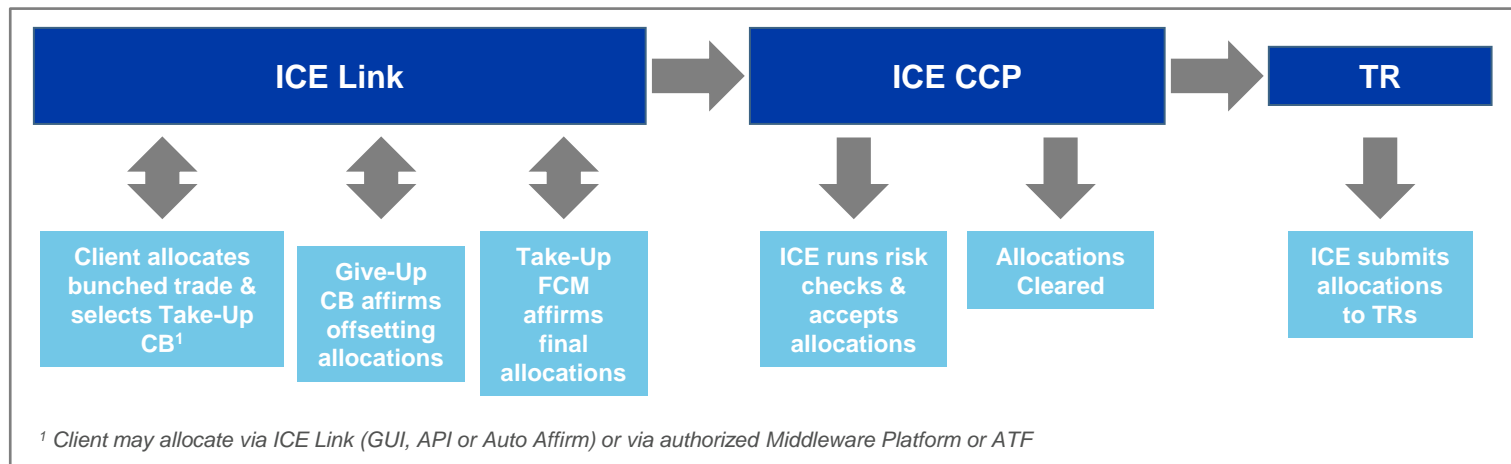
CDS ATF BUNCHED TRADE WORKFLOW

ALLOWS CLIENTS TO EXECUTE AT THE BUNCHED LEVEL AND ALLOCATE POST CLEARING

Step 1. Bunched trade ATF executed & cleared by ICE via the ATF Direct workflow



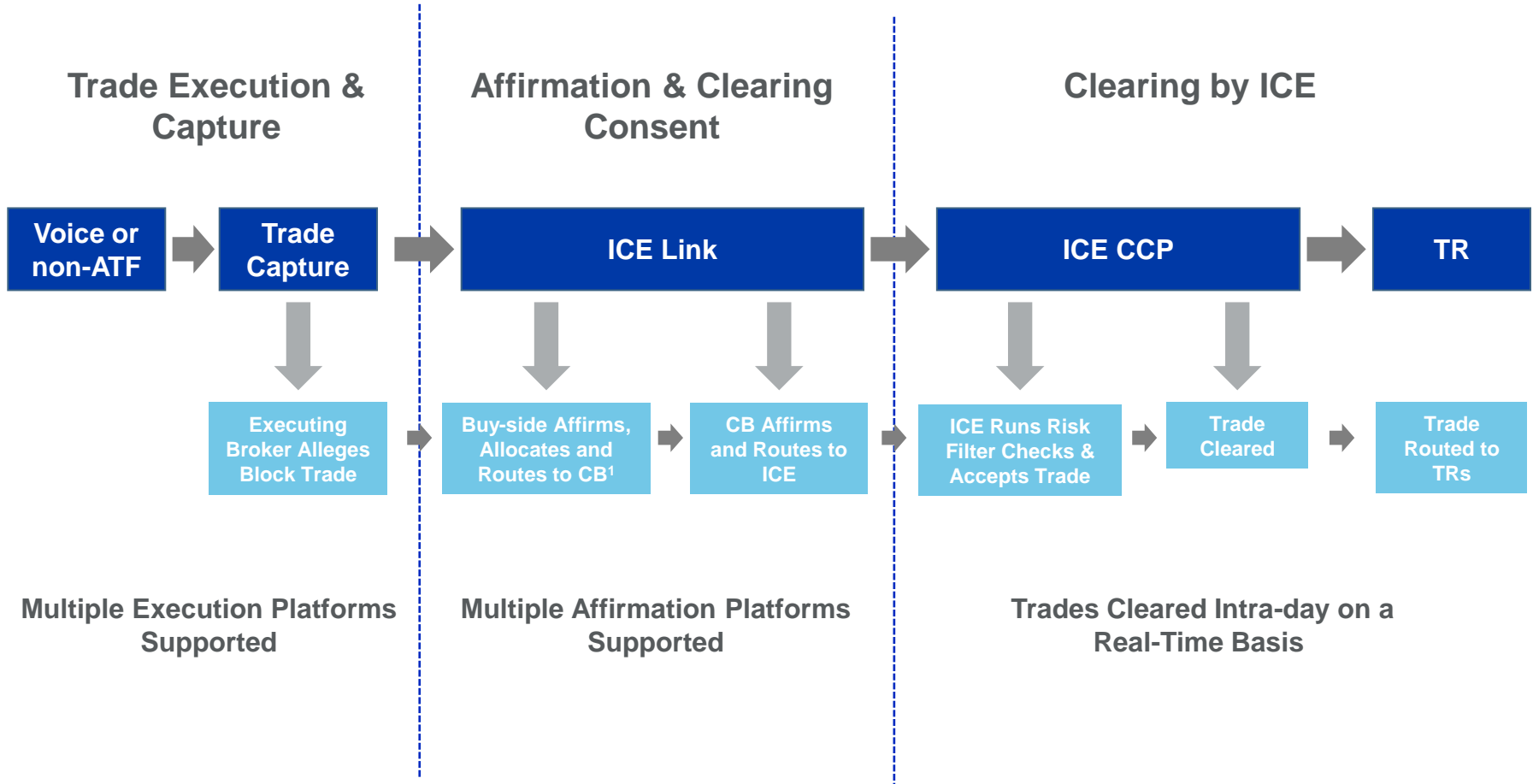
Step 2. Allocations provided by client & cleared by ICE



¹ Client may allocate via ICE Link (GUI, API or Auto Affirm) or via authorized Middleware Platform or ATF

CDS OFF-FACILITY TRADE WORKFLOW

ICE SUPPORTS THE EXISTING OTC MODEL AND MULTIPLE EXECUTION AND AFFIRMATION PLATFORMS



¹ Client may allocate via ICE Link (GUI, API or Auto Affirm) or via authorized Middleware Platform or ATF