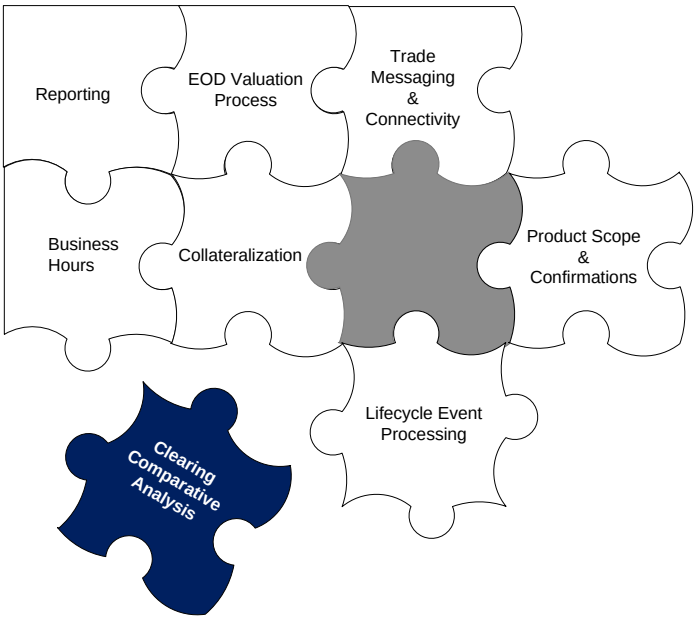
CIG | Clearing sub-group

Credit Clearing Comparative Analysis

Version: 1.0



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1. FOREWORD

This document was created on behalf of the Credit Implementation Group ("CIG") at the request of the Credit Steering Committee ("CSC"). The CIG were asked to set out the comparative models and differences between operational processes for current and future Central Clearing Counterparties ("CCPs") Credit offerings. To achieve this objective the CIG appointed the Credit Clearing Comparative Analysis Working Group ("sub-group"). The CIG sub-group were tasked with identifying the key operational topics and with creating a CCP survey that would extract the desired output across each of these topics from the CCPs. It was requested that both the survey and resulting CCP work flow diagrams focus solely on front-to-back operational processing and not venture into business related questions, which are being debated elsewhere.

The following content is based on information provided by the CCPs and is restricted to information which they considered not to be proprietary or confidential. The information presented is based on CCP responses to the survey that was circulated at the end of March 2011 and the additional requests for clarification that followed. ISDA has not undertaken to review the accuracy of the information presented and does not assume any responsibility for any use to which the information may be put.

It is expected that the output will be utilized to promote standardization within the marketplace and assist in an effort to risk manage any near term changes to the CCP offerings. The survey therefore serves two purposes: 1) promote a level of standardization at points in the work flow which can be targeted for such harmonization; 2) assess the current, and where possible future, operational CCP work flows in order to risk manage any transitional problems with upcoming models.

Dealer to Dealer ("D2D"), Dealer to Client ("D2C") and Futures Commission Merchant ("FCM") models, as and where appropriate, have been considered. 4 CCPs completed the survey: CME Group Inc. ("CME"), IntercontinentalExchange, Inc. ("ICE Clear Europe" & "ICE Trust US"[1]) and LCH.Clearnet S.A. ("LCH"). The International Swaps and Derivatives Association ("ISDA"), CIG and CSC extend their thanks to the aforementioned CCPs for their participation.

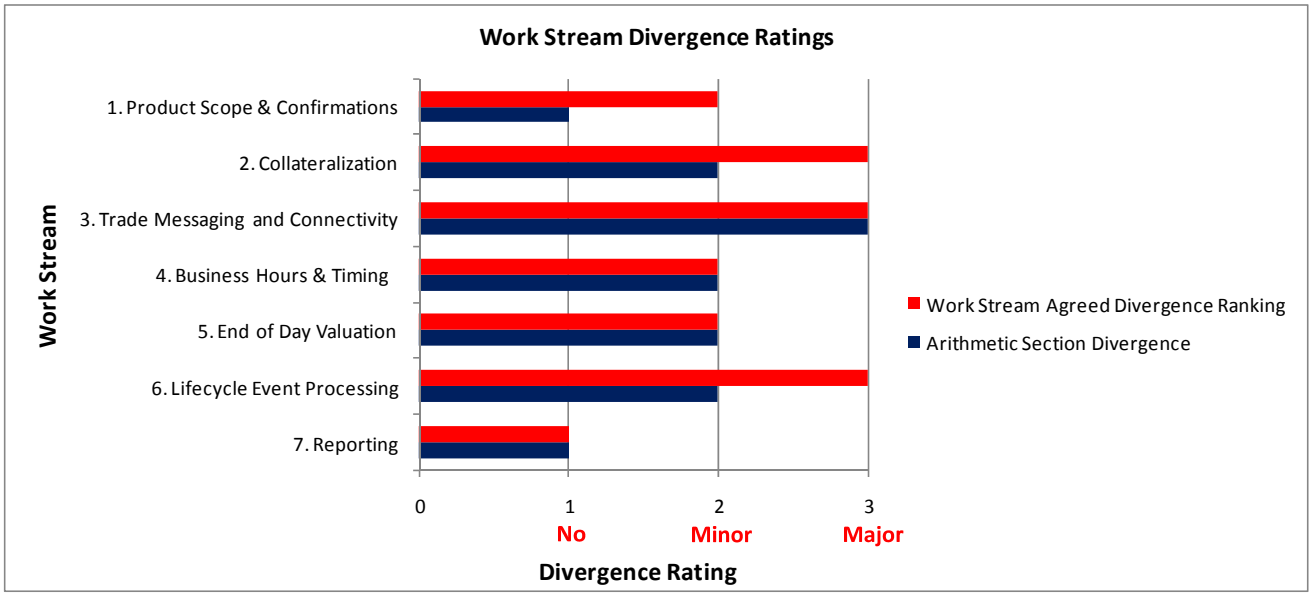
The analysis undertaken is not intended to provide an industry best practice, nor comment on the effectiveness of any CCPs or their processes. The purpose of the document is solely to highlight the identified divergences that may exist between the CCPs operational processes, and does not present any participant's individual or the sub-group's collective opinion on the offerings presented. As a result the sub-group does not present any conclusions or findings, aside from those that are perceived to be factual divergences stated within this document.

[1] Both CCP entities are trademarks of IntercontinentalExchange, Inc.

2. EXECUTIVE SUMMARY

The CIG sub-group have reviewed content across 7 work streams and created work flows for all CCPs models within scope (Each work stream and associated module have been assigned divergence ratings to indicate: 1 = No divergence in CCP process; 2 = Minor divergence in CCP process and 3 = Major divergence in CCP process. Please see section 4 for further guidance on ratings used in this document.

Below are the consolidated divergences per work stream. Only key divergences are highlighted within the section below, for further details readers should reference the following associated sections or for more granular detail refer to the separate "CCP Snap-Shot Matrices" document published alongside this document.



2.1 Product Scope & Confirmations [Divergence Rating 2 = Minor Divergence]

- Usage of MarkitSERV LLC's DSMatch ("DSMatch") for confirmation and The Warehouse Trust Company LLC's[2] Trade Information Warehouse ("TIW") for trade registration purposes is inconsistent across CCPs:
  - CME's use of the TIW is limited to the entry of a copper record at the position level.
  - ICE[3] and LCH use the TIW to register all trade level activity.
- In all cases the legal record is maintained at the CCPs.
- Fallbacks provide the most significant divergence:
  - LCH are looking to the Middleware to support Fallback processing outside of CCP business hours.
  - Other CCPs provide few clear specifics about proposed Fallback processes under future models.
  - All CCPs are awaiting the pending Commodity Futures Trading Commission ("CFTC") rules to assess the impact on Fallback provisions.

2.2 Collateralization [Divergence Rating 3 = Major Divergence]

- Ability to perform intra-day margining differs across CCPs:
  - ICE has the ability to perform intra-day valuations and calls for margin throughout the day.
  - LCH perform margin calculations and calls for margin on the morning of T+1.
  - CME has the capability to calculate and collect both intra-day and end-of-day margins. However CME only collects end-of-day margin at present. CME runs intra-day calculations for internal purposes. CME will re-evaluate to move to collect intra-day as demand requires.
  - LCH does not have the capacity to perform intra-day margin calculations.
- Pricing methods differed between CCPs:

[2] A subsidiary of DTCC DerivSERV LLC.
[3] When "ICE" is mentioned alone it should be assumed that the statement applies to both ICE Clear Europe and ICE Trust US.

- Both ICE and CME use Clearing Member ("CM") submitted bid/offer quotes whereas LCH currently use Markit™ pricing for mark-to-market ("MTM") calculations.
- LCH will move to a member submitted quote system once they have sufficient members live on the service to provide the necessary liquidity that will ensure the integrity of their pricing.

- No divergences were found when looking at the segregation of buy-side collateral, all CCPs have designed processes thought to be in line with the CFTC and Securities Exchange Commission ("SEC") regulations.

2.3 Trade Messaging & Connectivity [Divergence Rating 3 = Major Divergence]

- Connectivity to upstream platforms varies in line with CCP's business models, customer demand and how established the offering is:
  - CME and ICE have established direct connectivity to a multiple Inter-Dealer Brokers ("IDBs") and trade execution platforms (many soon to be classified Swap Execution Facilities ("SEFs").
  - LCH currently has no direct connectivity to any upstream platforms.
- CME and ICE provide open-access to their clearing platforms via API's that are freely available to all incumbent and future affirmation and execution facilities that wish to connect for clearing and settlement services.
- LCH provides an agnostic API for upstream platforms and will extend connectivity to other affirmation and execution platforms based on customer demand. The current daily batch novation model is connected to the TIW and DSMatch and there are future plans under the proposed intra-day novation model to connect to MarkitWire which will provide access to multiple IDBs.
- It was not possible based on information received to perform a detailed analysis to validate the exact extent of current/future STP arrangements for affirmation, clearing submission, post trade messaging and netting between upstream /downstream vendors and CCPs.

2.4 Business Hours & Timing [Divergence Rating 2 = Minor Divergence]

- Different processes and levels of support exist across CCPs for amending trades that are in a pending status post CCP close.
  - CME utilizes a withdraw work flow solution that can be used to correct and resubmit trades.
  - ICE currently provides a process which involves cancelling & rebooking transactions.
- The fact that some CCPs will allow for changes after affirmation while a trade is pending clearing, may require further operational attention in the future, if the intention is to streamline processing across CCPs.
- All CCPs currently appear reliant on matching and affirmation platforms to provide the reporting of trades queued up after closing hours.
- Only CME currently provides 24-hour support for queuing trades. ICE Trust & ICE Clear plan to provide 24-hour support in their future 24-hour operating models.
- All CCPs are currently open between 08:00-18:00 local time but both CME's current and ICE's future models provide extended coverage.

2.5 End of Day Valuation Process [Divergence Rating 2 = Minor Divergence]

- All CCPs use Markit™ RED as their reference data source. There is some divergence around where settlement prices are published with different platforms utilized.
  - ICE Trust and ICE Clear publish on their website and on Markit™.
  - LCH on SPAN® file published on client web portal and client FTP server.
  - CME via CME website and publication via FTP.
- The timings for distribution of prices across clearing platforms varied according to geographical location with LCH publishing later in the day than other CCPs.
- Divergences existed between CCPs on the requirement for CMs to submit prices. LCH does not require submission whilst all other CCPs do.
  - The timings for CM price submissions are consistent across CCPs and timings only vary based on the local time of the geographic location in question.
- There were no divergences recorded on how CCPs provide information to CMs for reconciling MTM positions as all CCPs produce daily reports to facilitate reconciliation. Although there were differences noted as to report formats and whether delivered at position or trade level (or both).

2.6 Lifecycle Event Processing [Divergence Rating 3 = Major Divergence]

- Approaches for trade netting, representations of trade verses positions and netting frequency differed between CCPs.
- CCPs use different platforms for servicing post trade events ("PTEs"):
  - LCH, ICE Trust and ICE Clear use the TIW.
  - CME utilizes their own platform.
- None of the CCPs have functionality in place to fully support the de-clearing process. All have processes in place that although manual in nature, do appear to result in similar end results.
- Settlement infrastructure varied from CCP to CCP:
  - ICE Clear and ICE Trust currently use CLS but will be moving to an internal payment structure in the future.
  - LCH uses Continuous Linked Settlement ("CLS"), but would welcome post current industry discussions moving to making all payments through Trans-European Automated Real-time Gross Settlement Express Transfer System ("TARGET2"), as was the case previously.
  - CME uses direct settlement with CME approved Settlement Banks.
- Settlement timings for cash flows were broadly in line allowing for local time differences with only a minor variance.
- Clearing timings differed across CCPs with CME clearing on T+1 and all other CCPs currently using T+3 settlement. (This subject matter is currently being discussed within industry forums. LCH have stated that they will adapt their model according to the outcome of these discussions).
- CME currently nets cash flow and margin. LCH, ICE Trust and ICE Clear currently do not (although ICE will in the future, and LCH would welcome reverting to a model where cash flows and margins are netted).
- For backloading CME and LCH offers the ability to run backloading daily, ICE Clear and ICE Trust offer a 5 day cycle. Each CCP provides information for monitoring affected bulk positions on their own platforms.
- ICE Clear and LCH both support Restructuring Credit Events and use the DTCC TIW to process them. Whilst CME and ICE Trust do not support cleared trades with Restructuring terms as neither clear European Single Names ("SNs") or indices. Only ICE Clear currently supports Old Restructuring Events.
- Succession Events and Renames are processed by LCH, ICE Clear and ICE Trust within the TIW, with the primary divergence being CME who currently processes these within their own platform. All processing solutions are thought to be ISDA Protocol compliant for both Credit & Successor Events. LCH does not support a process whereby the CCP or dealers can bilaterally or unilaterally trigger a Credit or Succession Event should no "Determination Committee ("DC") ruling have been made. LCH expect proposed upcoming DC rule changes may be sufficient to remove the necessity for a backup internal DC.

2.7 Reporting: [Divergence Rating 1 = No Divergence]

- No significant divergence between CCPs with regards to reporting. Whilst each CCP provides reports in different formats the basic operational reports are available at all of the CCPs.
- The only variance the work stream wished to highlight was that reports were not available from all CCPs at both trade and position level.

2.8 Process Flows [Divergence Rating = N/A]

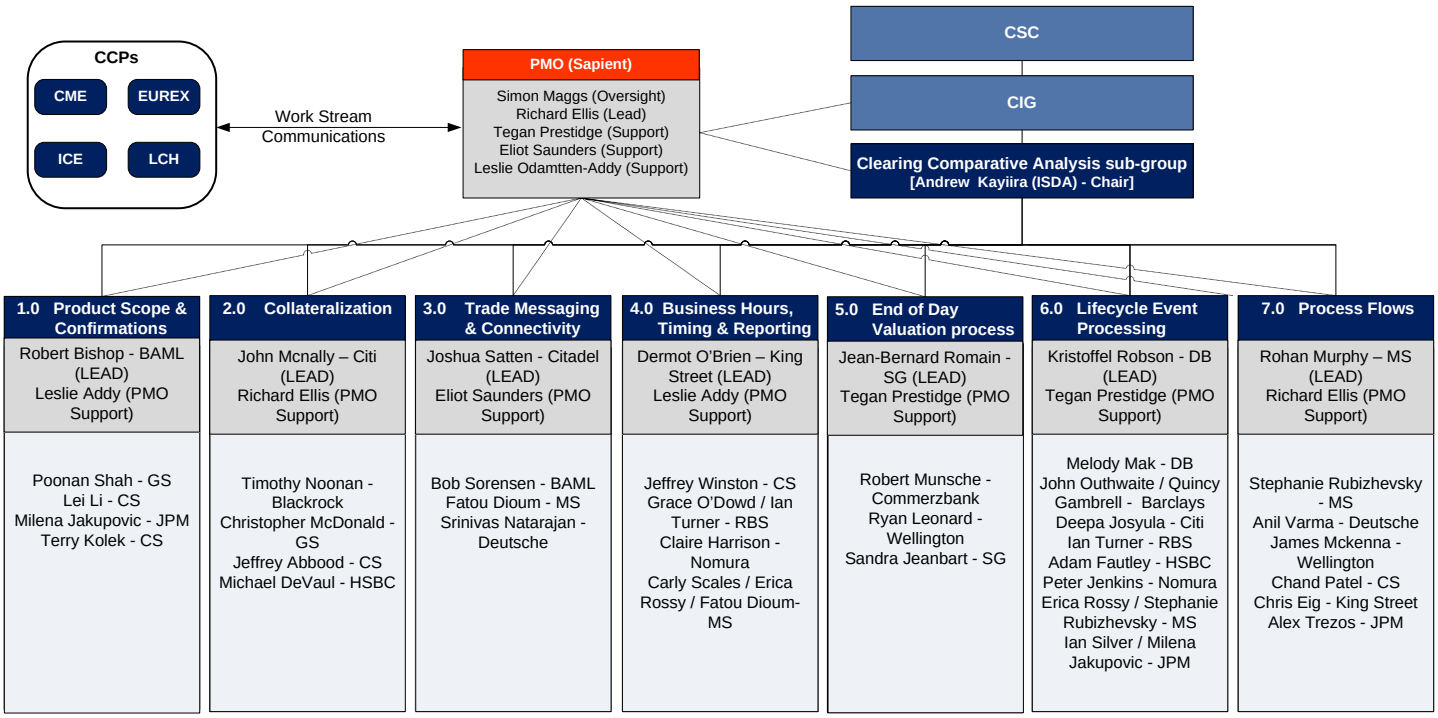
The process flow section sets out each of the CCP's current work flows. This section is for information purposes and the explicit divergences have been captured elsewhere.

3. INTRODUCTION

3.1 Background

The Credit Clearing Comparative Analysis sub-group was established to determine the comparative models and differences between operational processes for current and future Central Clearing Counterparties ("CCPs") Credit offerings.

The group was asked to determine divergences across a wide range of topics specific to Credit CCP operational processes. To this end, 7 priority topics were identified and the appropriate governance was established. This involved establishing 7 work streams to cover the key operational topics in scope and review associated CCP responses. An additional work stream also captured each CCP's process flows.



3.2 Scope & Deliverables

3.2.1 Scope

As part of the project initiation the sub-group agreed the below scope/principles:

- Output to be targeted towards driving standardization and risk managing near term changes to CCP offerings.
- Exercise to be purely operational in nature and avoid business related issues.
- Current and future CCP models are both in scope.
- Dealer to Dealer ("D2D"), Dealer to Client ("D2C") and FCM models (where appropriate) were considered.
- 4 CCPs were considered in scope: CME, ICE Clear Europe, ICE Trust US and LCH.

The following principles guided the efforts of all work streams:

- The sub-group will at all times remain vendor agnostic and refrain from presenting opinions on the divergences identified.

- The sub-group are not seeking to diminish or establish competitive advantage; rather the focus is on identifying and highlighting divergences in CCP processes.

3.2.2 Deliverables

The key deliverables identified for the exercise were as follows:

1) Comparative operational clearing service matrix (detailing CCP survey responses).

2) CSC summary document detailing the identified differences across CCP platforms with the following divergence rating scale [1 = No Divergence / 2 = Minor Divergence / 3 = Major Divergence].

3) Consistent work flow diagrams for each CCP offering.

3.2.3 Approach

The CIG sub-group created a structured questionnaire/survey to serve as the basis for the comparison. The sub-group divided itself into work streams to focus on the specific topics detailed within the questionnaire.

An aggressive timeline was established to accommodate the July effective date of Dodd-Frank rules and any imminent changes to the clearing landscape.

The CIG sub-group engaged the CCPs and circulated each a matrix to complete for their respective current and future D2D, D2C and FCM models. Additional clarification requests were consolidated into batches and circulated on a weekly basis to the CCPs. Responses were updated into the matrix and circulated regularly to the established work streams.

Each work stream was tasked to determine any variances in CCP processes relating specifically to the topic they were allocated. In addition, a separate work stream was established specifically to produce CCP work flows which were to be agreed by CCPs prior to publication.

Prior to publication the CCPs in scope were requested to validate the content enclosed for both accuracy and completeness.

4. DOCUMENT GUIDANCE

The remainder of this document has been split into 7 sections (5.1 to 5.7), each detailing the topics identified for analysis. Section 5.8 details CCP work flows. The first 7 sections are prefaced with a high level summary of the agreed scope and the key divergences identified. Each work stream has been assigned the following attributes:

- Work Stream = Identifies the topic under discussion.
- Module No. = Identifies a group of questions that fall under a specific module (2.1, 2.2, 2.3....).
- Sub Module Ref. = Identifier for each question falling within a specific module (A, B, C….).
- Module Name = Identifies the sub-topics falling under each topic.
- Description = Details the question that was posed to each of the CCPs.

4.1 Divergence Ratings Explained

Each sub-module, module and work stream has been assigned a rating of either: 1, 2 or 3 to indicate the extent of the divergence.

1 **= No divergence in CCP process.**

2 **= Minor divergence in CCP process.**

3 **= Major divergence in CCP process.**

The "Work Stream Agreed Divergence Rating" has been determined by group consensus and takes a holistic view in regards to the overall work stream divergence (allowing for a higher weighting for any modules that the groups believed merited greater importance), whilst the "Arithmetic Section Divergence" is based solely on the mathematical calculation of the weighted average of all sub-modules within a work stream.

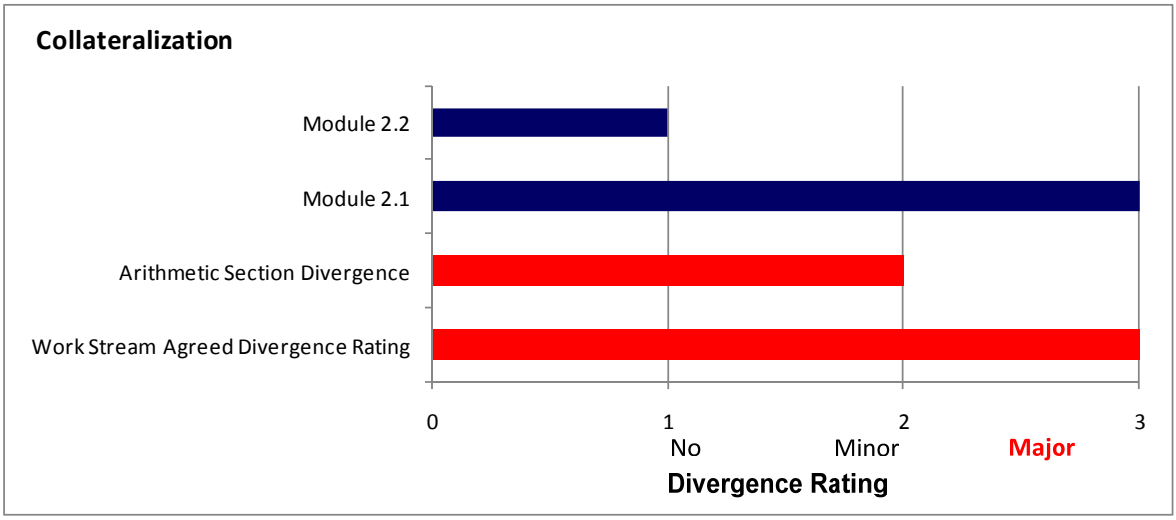
- **Arithmetic Section Divergence** = Sum of sub-module divergences ÷ No. of sub-modules.
- **Work Stream Agreed Divergence** = Determined by group consensus for each work stream.

Both calculations above are provided to illustrate that in some cases the rating awarded to a work stream will not always equate to the actual mathematical average of the sub-modules. This was to allow each work stream group the flexibility to place greater importance on some sub-module topics over others. As an example the Collateralization group rated the work stream divergence as a 3, yet the Arithmetic Section Divergence would have resulted in a divergence rating of only 2 when rounded upwards (e.g. 13/7 = 1.85):

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
2. Collateralization	2.1	A	Variation Margin or equivalent including pricing method and data sources	What mechanism is used to communicate intra day margin calls?	TBC	3	3	2
		B		How frequently is variation margin calculated?	3			
		C		How often and through what process is margin collected?	2			
		D		What pricing and data sources are utilized?	3			
		E		How is interest calculated and settled on collateral held/posted?	2			
	2.2	A	Buy side segregation	Is segregation of collateral supported for Clearing Members (CMs) and their clients and what are the requirements?	1	1		
		B		Is buy-side collateral for positions segregated by the CM in separate accounts or commingled with the assets of the CM or other customers collateral?	1			
		C		Provide details of the type of account used for this purpose (omnibus/registered customer account or other)	1			

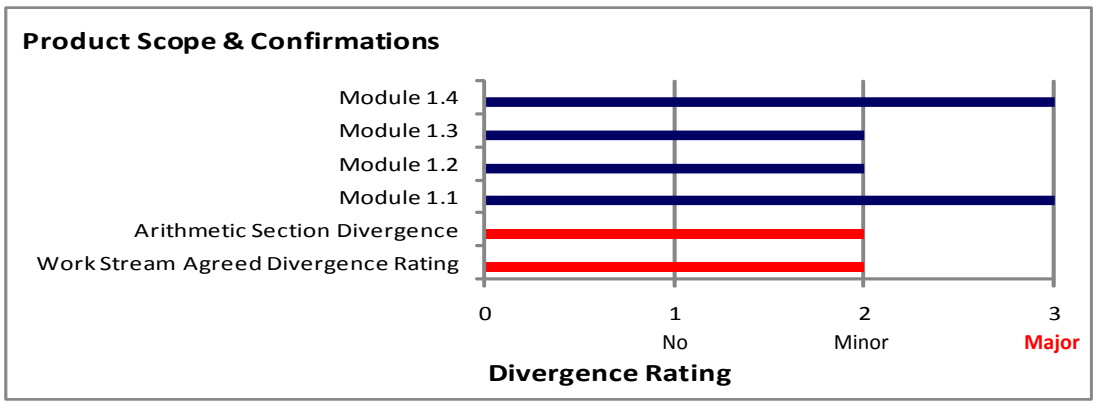
4.2 Divergence Barometers

Each work stream introduction also incorporates a barometer to highlight the overall divergences across all the questions (modules) considered within each work stream. These provide a visual representation of the agreed divergence ratings [1 = No Divergence / 2 = Minor Divergence / 3 = Major Divergence]. Both the arithmetic and work stream agreed divergence ratings are also provided (see the below example for collateralization).



5. WORK STREAM FINDINGS:

5.1 Product Scope & Confirmations [Divergence Rating 2 = Minor Divergence]



5.1.1 Scope

The work stream referred to as "Product Scope & Confirmations" was tasked with determining the established or planned practices amongst the CCPs for the following areas:

- Live Products
- Confirmations
- Fallbacks

Although the CCPs were responsive to the requests for information, there were varying levels of detail provided.

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
1. Product Scope & Confirmations	1.1	A	Live Products	Which products does the service currently support?	2	3	2	2
		B		What is the methodology to add a new product / index / tenor / currency to the service?	3			
	1.2	A	Products Active & Under Development	Which products are currently under development (include proposed launch dates)?	2	2		
		B		How are members notified of new products added to the service?	1			
	1.3	A	Confirmations	Does DTCC TIW representation provide legally binding confirmation, if not, where is the legal confirmation stored?	1	2		
		B		How is trade confirmation and registration within the DTCC Warehouse (TIW) supported (assume support of Gold Records unless otherwise stated)?	3			
	1.4	A	Fallbacks	What fallbacks are in place for when a trade does not clear prior to the cut-off time?	2	3		
		B		By what time on T+1 is election of a fallback option required?	2			
		C		Where a transaction has been partially cleared do fallbacks apply to the portion of the trade uncleared?	2			
		D		Can fallbacks be executed outside of CCP operating hours provided the clearing deadline has passed?	1			

5.1.2 Divergence Summary

The key divergences to highlight were as follows:

Live Products:

- Product coverage currently varies with CCPs going live with different products at varying times. All currently support localized indices with both CME and LCH planning to onboard Single Names comprised within the main indices over the coming year. ICE also plans to add to their existing Single Name coverage.
- Not all CCPs were able to provide the exact criteria for registering new products. ICE provided a set of criteria, but LCH and CME were focused more on the governance of the process and less on the detail.

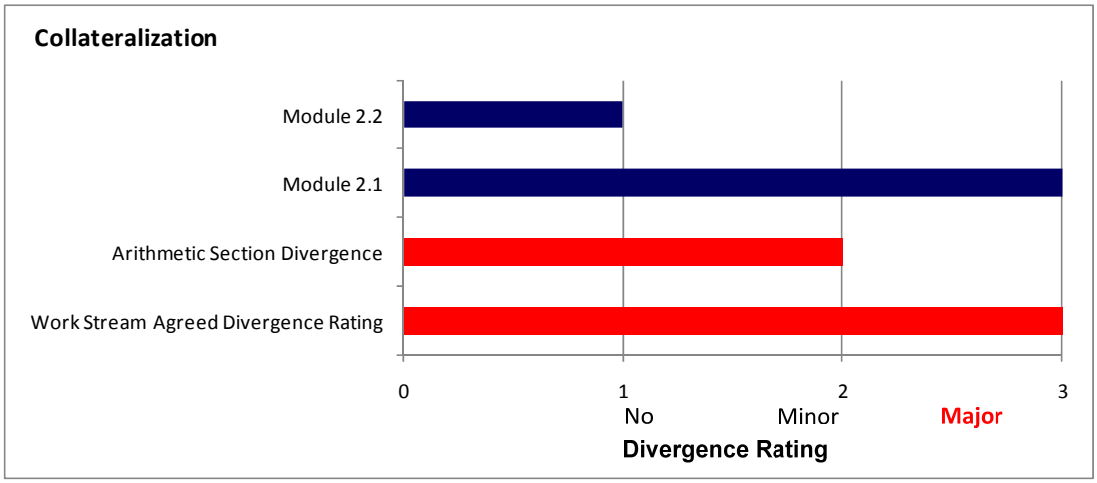
Confirmations:

- The legal confirmation record is maintained at the CCPs without exception. Utilization of MarkitSERV's DSMatch confirmation platform and the TIW for registration purposes differs across CCPs:
  - CME's intended use of the TIW is limited to the entry of a copper record at the position level.
  - Both ICE and LCH will be recording all activity within the TIW at trade level (although their processes differ in this area). The method of registration for LCH and ICE is via electric submission direct from the CCP on behalf of all parties.

Fallbacks:

- Fallbacks provided the largest divergence within the scope of this work stream.
  - ICE currently defines a clear Fallback process.
  - LCH seemed to depend on the Middleware for processing and in part on timings. The intent, from the data received, was to be agnostic to the Middleware, but it is not clear how this could be the case with such dependencies placed on the vendor.
  - CME seem to be gearing their Fallback provisioning towards bilateral counterparty agreements. Whilst other CCPs, provided few clear specifics about proposed Fallback processes.
- Although current Fallback timings were defined by CCPs, this area remains under discussion by industry participants and may be impacted by upcoming regulatory reforms. Current and planned election timings for Fallback on T+1 differ between ICE and CME.
- In all cases no details were provided by any CCP regarding the impact of the impending CFTC regulations on the Fallback provisions, with most apparently watching the pending developments in this area.

5.2 Collateralization [Divergence Rating 3 = Major Divergence]



5.2.1 Scope

The Collateralization work stream analysed the different frequencies and methods of calling for and receiving margin, including the pricing sources utilized and interest paid on margin held. Module 2.2 specifically examined the methods in use for the segregation of collateral for CMs and client assets posted to the CCPs.
The information omitted by some of the CCPs was the mechanism used to communicate margin calls, meaning the group were unable to provide an accurate judgement on the divergences in this process.

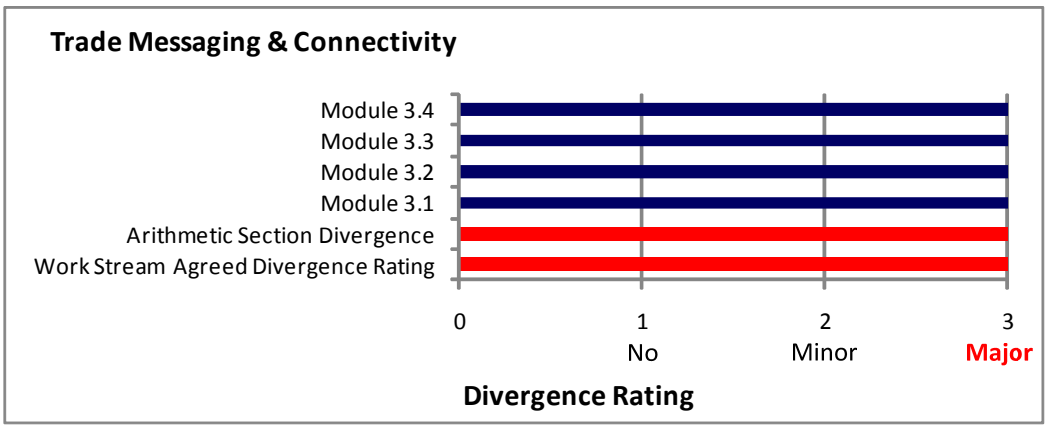
5.2.2 Divergence Summary

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
2. Collateralization	2.1	A	Variation Margin or equivalent including pricing method and data sources	What mechanism is used to communicate intra day margin calls?	TBC	3	3	2
		B		How frequently is variation margin calculated?	3			
		C		How often and through what process is margin collected?	2			
		D		What pricing and data sources are utilized?	3			
		E		How is interest calculated and settled on collateral held/posted?	2			
	2.2	A	Buy side segregation	Is segregation of collateral supported for Clearing Members (CMs) and their clients and what are the requirements?	1	1		
		B		Is buy-side collateral for positions segregated by the CM in separate accounts or commingled with the assets of the CM or other customers collateral?	1			
		C		Provide details of the type of account used for this purpose (omnibus/registered customer account or other)	1			

The divergences to highlight were as follows:

- The frequency of calculating margin and performing intra-day margin calls. The ICE entities have the ability to perform this intra-day and call for margin at various points throughout the day. LCH perform margin calculations and calls for margin on the morning of T+1 and does not have capacity to perform intra-day margin calculations. CME has the capability to calculate and collect both intra-day and end-of-day margins. However CME only collects end-of-day margin at present. CME runs intra-day calculations for internal purposes. CME will re-evaluate to move to collect intra-day as demand requires.
- When analyzing the pricing sources used for MTM calculations, it was discovered that both ICE and CME use member submitted bid/offer quotes whereas LCH use Markit™ pricing. LCH will move to a member submitted quote system once they have sufficient members live on the service to provide the necessary liquidity that will ensure the integrity of their pricing.
- A minor divergence was found on the interest calculation for VM as ICE Clear Europe uses the "ICE Deposit Rate" for calculating interest.
- No divergences were found when looking at the segregation of buy-side collateral as all CCPs had created this process to be in line with the CFTC regulations surrounding the segregation of client assets.

5.3 Trade Messaging & Connectivity [Divergence Rating 3 = Major Divergence]



5.3.1 Scope

The Trade Messaging and Connectivity work stream were responsible for obtaining information from the CCPs in relation to all the current and future platforms and connectivity mechanisms that CCPs are, or will be, connected to.

CCPs were asked questions across the following categories:

- Trade Submission
- Clearing Approval (Affirmation)
- Post Trade Messaging
- Backloading
- Netting and Reporting
- Portability

5.3.2 Divergence Summary

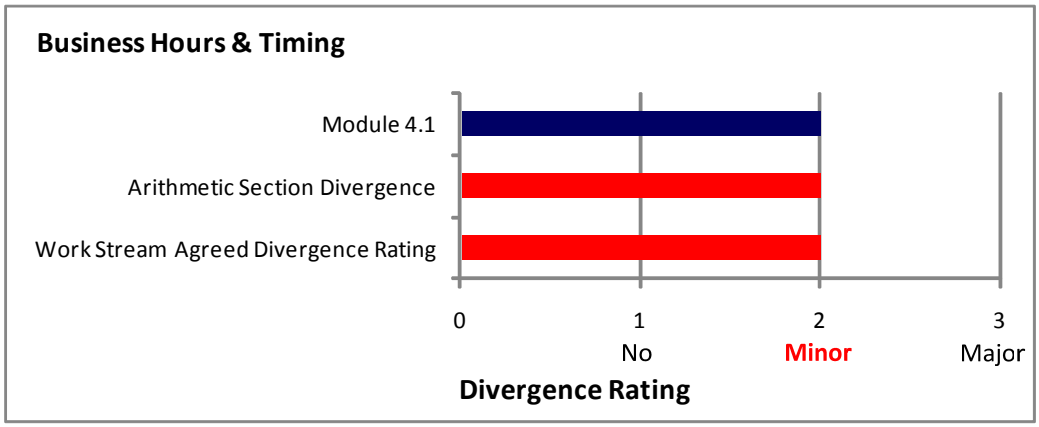
Based on the information provided by CCPs, the following divergences were identified:

- CME and ICE have direct connectivity to a number of IDBs[4] and trade execution platforms (connectivity is expected to be replicated once transitioned to the SEF landscape). LCH currently has no connectivity to any upstream platforms.
- CME and ICE intend to provide open access to their clearing platforms via API's that will be freely available to all incumbent and future affirmation and execution facilities that wish to connect for clearing and settlement services.
- LCH's current daily batch novation model is currently only connected to DerivSERV and MarkitSERV for access to the DTCC TIW but they have future plans under their proposed intra-day novation model to connect to MarkitSERV for MarkitWire as the first upstream trading and matching platform. MarkitWire is connected to multiple IDBs. LCH provides an agnostic API for upstream platforms and will extend connectivity to other affirmation and execution platforms based on customer demand.
- It was unclear as to the exact extent of current and future STP offerings between IDBs and execution platforms across CCPs processing steps. The work stream had requested clarification in this area but it remains pending.
- It was unclear what BCP arrangements were in place specifically between CCPs and upstream IDBs and execution platforms.

[4] ICE Current & Future D2D models are connected to the following IDBs: BGC; Creditex; Phoenix Partners; Tullett Prebon; Tradition; Vyapar CM; GFI (Q2) and ICAP (Q2). CME did not specify which IDBs they have connectivity with.

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
3. Trade Messaging and Connectivity	3.1	A	List the available platforms and mechanisms for connectivity per vendor for Trade Submission, Clearing Approval, Post Trade Messaging, Backloading, Netting and other functions and Portability.	Trade submission (including manual entry / SEF submission / voice) CCP to list each individual vendor they are or will be connected to	3	3	3	3
		B		Clearing approval CCP to list each individual Affirmation provider they are or will be connected to	3			
		C		Post trade messaging - CCP to list each Valuation / Reporting provider they are or will be connected to	3			
		D		Backloading	3			
		E		Netting and other functions	3			
		F		Portability - Please advise the workflow and messaging expected in relation to: Portability between DCMs or FCMs	3			
		G		Portability - Please advise the workflow and messaging expected in relation to: Fund to fund transfer Portability	3			
	3.2	A	Is a full STP electronic processing solution available on the following; Trade Submission, Clearing Approval, Post Trade Messaging, Backloading,	Trade submission (including manual entry / SEF submission / voice)	3	3		
		B		Clearing approval	3			
		C		Post trade messaging	3			
		D		Backloading	3			
		E		Netting	3			
		F		Portability - Contingency plans in in relation to: Portability between DCMs or FCMs	3			
		G		Portability - Contingency plans in in relation to: Fund to fund transfer Portability	3			
	3.3	A	What contingency plans exist for failures in the STP process for; Trade Submission, Clearing Approval, Post Trade Messaging, Backloading, Netting and other functions and Portability?	Trade submission (including manual entry / SEF submission / voice)	3	3		
		B		Clearing approval	2			
		C		Post trade messaging	3			
		D		Backloading	3			
		E		Netting and other functions	3			
		F		Portability - Please advise the workflow and messaging expected in relation to: Portability between DCMs or FCMs	3			
		G		Portability - Please advise the workflow and messaging expected in relation to: Fund to fund transfer Portability	3			
	3.4	A	Do you envisage any differences to any of the above questions for Dealer to Dealer versus Client Clearing models and (ii) Is there any expectations to alter any of the above workflows in future, to your knowledge?		3	3		

5.4 Business Hours & Timing [Divergence Rating 2 = Minor Divergence]



5.4.1 Scope

The Business Hours & Timing work stream compared current business operating hours and availability/method of support across CCPs for queuing trades after CCP business hours.

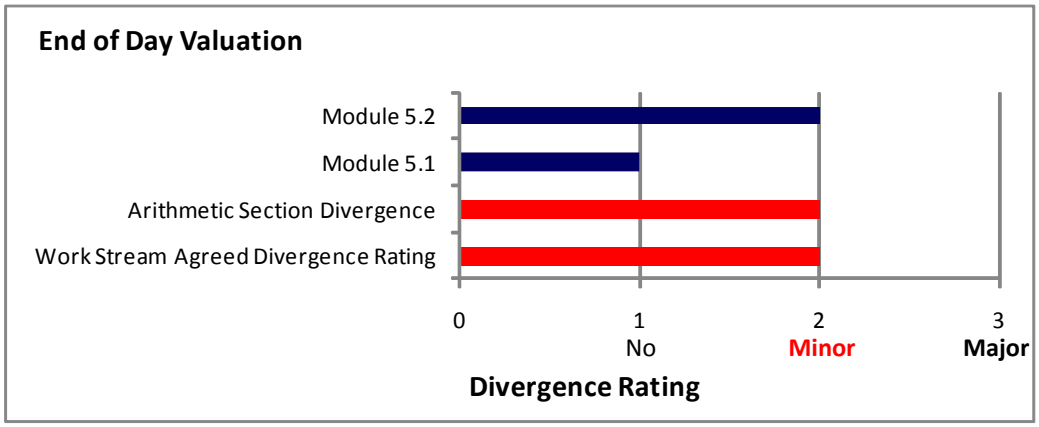
5.4.2 Divergence Summary

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
4. Business Hours & Timing	4.1	A	Business Hours	What are the platforms current business/operating hours?	2	2	2	2
		B		Is 24 hour support available for queuing trades post CCP close?	2			
		C		Is a unique message type allocated to trades submitted for clearing after CCP business hours?	1			
		D		Are reports available on a nightly basis as to what trades have been queued up after closing hours?	1			
		E		Is a clear protocol in place for correcting trades that are pending clearing post CCP close?	3			
		F		Can trades be queued and remain in pending status until 17:00 local time the next business day?	1			

The key divergences to highlight were as follows:

- Currently major differences exist between the protocols for amending trades that are in a pending status post CCP close.
  - Based on information provided only CME allows for a work flow solution for corrections on trades that are pending post CCP close. ICE provides a process which involves cancelling & rebooking transactions.
  - The fact that some CCPs will allow for changes after affirmation, and while a trade is pending clearing, may require further operational attention in the future if the intention were to streamline processing across CCPs.
- Minor divergences currently exist across CCPs for current business/operating hours. All CCPs are currently open between 08:00-18:00 local time but CME's current, and both of ICE's future models, provide extended coverage.
- Only CME currently provides 24-hour support for queuing trades. ICE Trust & ICE Clear plan to provide 24-hour support in their future 24-hour operating models.
- No CCP currently generates unique messages or provides reports on queued trades submitted after CCP closing hours. All appear reliant on affirmation and execution platforms to provide this information. Although no divergence exists between CCPs in this area, if either unique messages or reporting should be required, both would need to be implemented across all offerings considered.

5.5 End of Day Valuation Process [Divergence Rating 2 = Minor Divergence]



5.5.1 Scope

The work stream referred to as End of Day Valuations was tasked with comparing the pricing processes and reference data used to determine settlement prices and what if any, data was provided to the CMs for reconciliation purposes.

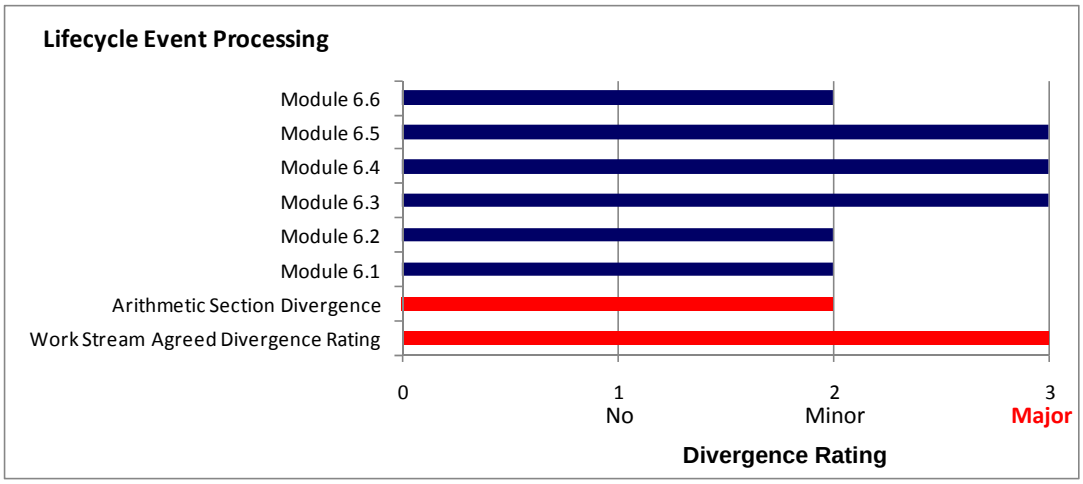
5.5.2 Divergence Summary

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
5. End of Day Valuation	5.1	A	Pricing & Product Reference Data sources	What product reference data sources are utilized?	1	1	2	2
	5.2	A	Pricing Process	Where are settlement prices published and who are they made available to?	2	2		
		B		At what time does the clearing platform distribute prices?	2			
		C		Are Clearing Members (CMs) required to submit prices?	3			
		D		What is the process and timeframe for submitting prices?	3			
		E		What information is provided to Clearing Members (CM) in order to reconcile MTM positions?	2			

The key divergences to highlight were as follows:

- There are divergences concerning the necessity for members to submit prices to the CCP:
  - LCH is the only CCP not requiring its members to submit prices for the settlement price. The reason being that LCH does not currently have the membership volumes to support a member quote driven pricing system. LCH has built the infrastructure necessary for members to submit settlement prices and will roll this out when membership numbers increase.
- The timelines for submissions:
  - Variances caused are due to geographical location and time zone differences, meaning LCH publishes later in the day than other CCPs.
- Settlement price publishing, both timing and process:
  - ICE Trust US and ICE Clear Europe publish settlement prices on their website and on Markit™.
  - LCH publishes settlement prices on SPAN® file published in the CDS section of their website and via FTP.
  - CME publishes via CME's website and via FTP.
- No divergence was recorded in relation to the responses for sub-module 5.2E as all CCPs produce daily reports to CMs in order to reconcile MTM positions. There were however differences identified in relation to report formats and whether delivered at position or trade level (or both), as well as the overall content and data dictionary usage.

5.6 Lifecycle Event Processing [Divergence Rating 3 = Major Divergence]



5.6.1 Scope

The Lifecycle Event Processing work stream covered netting approaches, PTEs, Settlement infrastructure, backloading / compression and Succession Events & Renames.

5.6.2 Divergence Summary

The key divergences to highlight were as follows:

Trade Netting:

- Differences were identified as to trade netting approaches and the representation of trade verses positions within CCPs and the overall frequency of netting cycles.

Trade Servicing:

- Trade Servicing (PTEs) arrangements differed according to the platform being utilized. LCH, ICE Trust US and ICE Clear Europe all use the TIW, whilst CME use their own platform.
- Based on feedback no CCP has de-clearing functionality built into their work flow and each suggest various approaches to facilitate the de-clearing process (e.g. in ICE counterparties create an equal and offsetting trade on the affirmation platform to flatten the position, also known as mis-clearing). The various CCP processes offered to facilitate de-clearing all appear to result in similar end results..

Settlement Infrastructure:

- Settlement infrastructure varied according to platforms utilized, with ICE Clear Europe, ICE Trust US currently using CLS and plan to move to an internal payment structure in the future. LCH also currently use CLS, but would support the processing of cash flows via TARGET2, allowing for the netting of settlements and margin payments. CME offers direct settlement with approved Settlement Banks.
- Notably T+1 verses T+3 settlements are currently being discussed within industry forums. LCH may change to T+1 clearing should this be the agreed outcome of these discussions. Such a move would be likely to impact the current stated settlement processing agent (see sub-module 6.3A in the associated CCP Snap-Shot Matrices document).

Geographical location:

- Geographical location caused some divergence in settlement timings for cash flows, although similar local timings are in place across geographies. CME currently settles T+1 and all other CCPs use T+3 settlement. CME also currently nets both cash flows and margin, whilst LCH, ICE Trust US and ICE Clear Europe currently do not.

Backloading & Compression:

- Backloading CCP reports for backloading provided for members on reconciliation varied as well as backloading cycle timings. LCH and CME run a daily cycle and ICE Clear Europe and ICE Trust US a 5 day cycle. Each CCP also provides information for monitoring affected bulk positions on their own platforms.

Credit Events Approach:

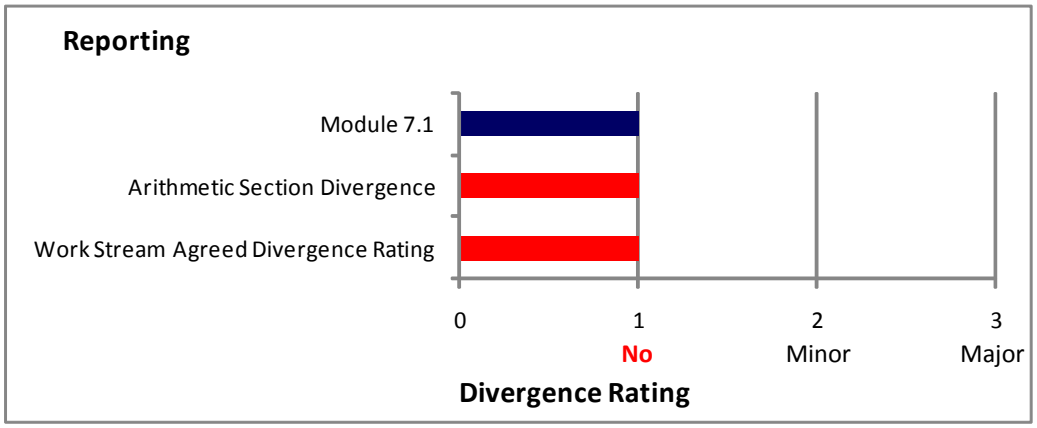
- ICE Clear and LCH both support Restructuring Credit Events and use the DTCC TIW to process them. Whilst CME and ICE Trust do not support cleared trades with Restructuring terms as neither clear European Single Names ("SNs") or indices. Only ICE Clear currently supports Old Restructuring Events.

Succession Events & Renames:

- Succession Events and Renames are processed by LCH, ICE Clear and ICE Trust within the TIW, with the primary divergence being CME who currently processes these within their own platform. All processing solutions are stated to be ISDA Protocol compliant for both Credit & Successor Events. LCH does not support a process whereby the CCP or dealers can bilaterally or unilaterally trigger a Credit or Succession Event should no "ISDA Determination Committee ("DC") ruling have been made. LCH highlights that potential DC rule changes in this area will remove the necessity for a backup internal DC.

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
6. Lifecycle Event Processing	6.1	A	Trade netting approach and effect on novations	Please describe the representation of a trade vs positions within a CCP?	2	2	3	2
		B		What type of netting approach is applied?	2			
		C		Is automatic netting available?	1			
		D		How frequently does netting occur?	3			
	6.2	A	Trade servicing, such as post trade events (PTE's) support (partials, amendments, novations, book changes)	How are Post Trade Events (PTE) handled? Are they automated via the platform or processed within the TIW?	2	2		
		B		Are bilateral amendments possible?	1			
		C		State explicitly any PTE's which are not currently supported and whether there are any plans to implement them at a later date.	1			
		D		Do participants have the option to de-clear a trade? If so list the different scenarios where this would be considered permissible?	1			
		E		Are any pre-conditions necessary to be in place to allow participants to de-clear transactions?	N/A			
		F		How are book changes reflected?	2			
	6.3	A	Settlement Infrastructure	How are coupons, fees and final cash settlements processed (central settlement process or other)?	3	3		
		B		Please provide the relevant timeframes for the settlement of cash flows.	2			
		C		Do you support the netting of cash flows and margin requirements? If so please describe the process?	2			
		D		Please advise whether clearing is performed T+1 vs T+3 for the relevant Clearing models.	3			
	6.4	A	Backloading & Compression	Please describe the process for backloading including frequency and preconditions to a backloading request	2	3		
		B		Please provide any information provided to members with regards to reconciliations, completeness and accuracy tests.	3			
		C		Is Dealer-Dealer (D2D) backloading segregated from Client (D2C) backloading?	2			
		D		Is compression of Dealer-Dealer (D2D) and Client (D2C) trades segregated?	2			
		E		What processing timeframes are in place around backloading cycles (from allege to processing)?	3			
		F		Are terminations and the new trades created facing the CH linked for audit purposes?	2			
		G		What facilities are in place to monitor the affected bulk positions?	3			
		H		Are trades consumed via an API or batch file or other process? If other, please provide details.	1			
		I		Where a Succession Event is pending ISDA DC determination or yet to be processed within the TIW under what name would the trade be back loaded into the CH (Old/New name)?	1			
	6.5	A	Credit Events approach	Do you subscribe to or support the triggering and management of Strategic Restructuring Credit Events?	3	3		
		B		To what extent do you use industry infrastructure to support this process?	3			
		C		In the event of no DC Determination do you have a process where you or dealers can bilaterally or unilaterally trigger a Credit Event or Succession Event?	3			
		D		Are both default Cash Settlement and Physical delivery supported via the auction process?	1			
		E		Is the process in place ISDA Protocol compliant?	1			
		F		Can Restructuring Events currently be supported for both Clearing Members (CMs) and non-Clearing Members?	3			
	6.6	A	Succession Events and Renames	Are the ISDA Determination Committees the recognized authority for determining both Successor Events and Credit Events?	1	2		
		B		Are Successor Events and Rename processing fully supported?	1			
		C		In what platform are these events processed?	2			

5.7 Reporting [Divergence Rating 1 = No Divergence]



5.7.1 Scope

The Reporting work stream was tasked with comparing the existing reports available to both CMs and clients across CCPs, incorporating distribution mechanisms and timing frequency. CCPs were also asked whether participants had the ability to customize reporting.

5.7.2 Divergence Summary

Work Stream	Module No.	Sub-Module Ref	Module Name	Description	Sub-Module Divergence	Module Divergence	Work Stream Agreed Divergence Rating	Arithmetic Section Divergence
7. Reporting	7.1	A	What reporting is currently provided to dealers/clients	Please provide details of the reports you currently provide to Clearing Members & clients and the associated data dictionary along with the distribution mechanism and frequency of the reports?	1	1	1	1
		B		Do Participants (CPs) have the options to customize the reporting?	1			

The group felt that there were few significant divergences with regards to reporting:

- Whilst each CCP provides reports in different formats the basic operational reports are available at all of the CCPs.
- The ability to customize reports is available from ICE but not from either CME or LCH who both offer standardized reporting formats only.
- The only significant variance the work stream wished to highlight was that reports were not available from all CCPs at both trade and position level.

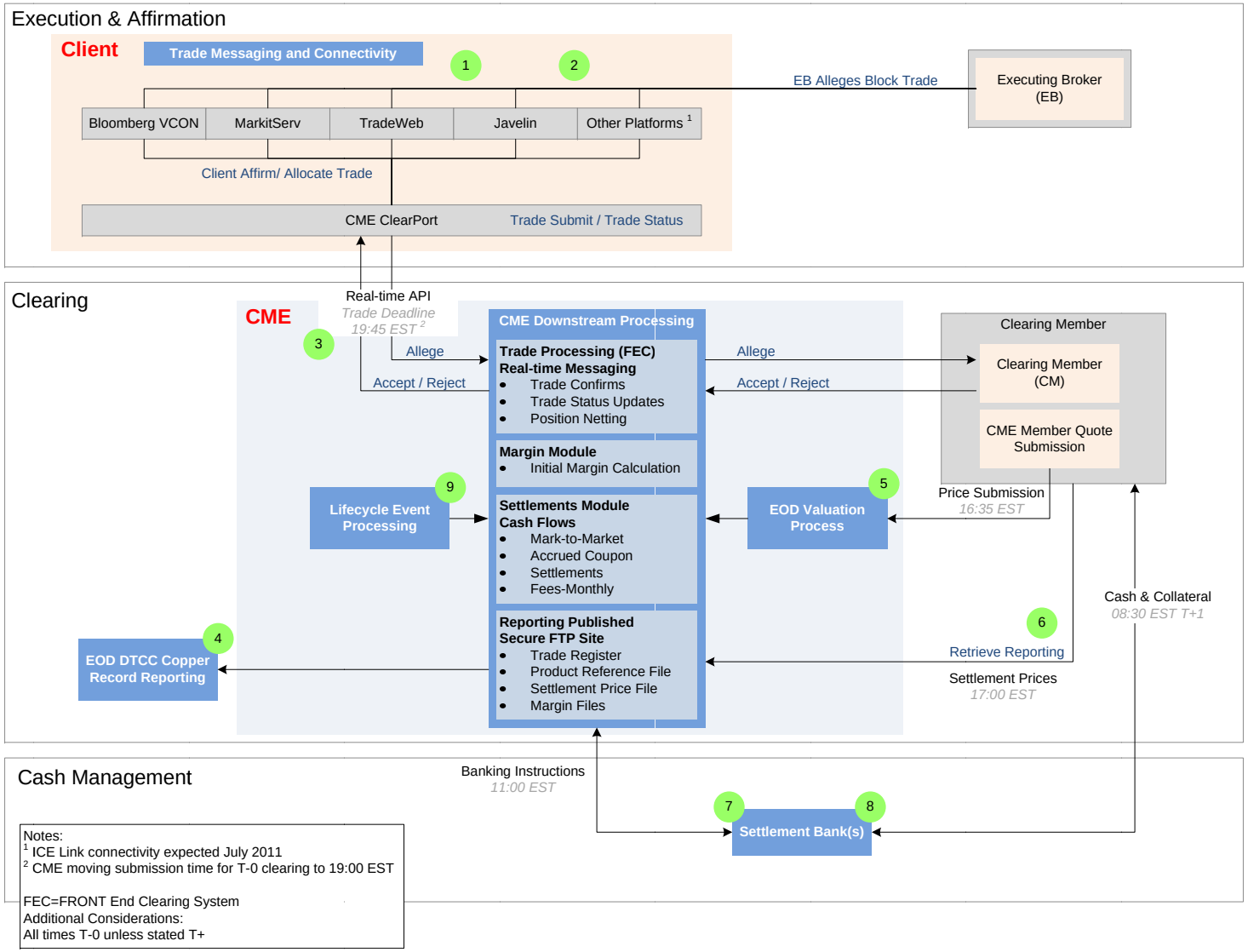
5.8 Process Flows [Divergence Rating = N/A]

The CIG sub-group was asked to provide uniform process flows for each CCP derived from the information provided. ICE & LCH indicated that there is currently insufficient information available regarding their future offerings to provide these process flows however CME advised that there were no material changes to the service offering expected in the near future highlighting that their current model is already FCM compliant.

Future service developments have been commented on in the notes box found on each process flow. D2D flows have been created for ICE Trust US, ICE Clear Europe and LCH. Client clearing flows have been created for CME Clearing and ICE Trust US. Dealer flows were not created for CME. Although CME do support a D2D model (and have advised that processing is identical to their client model) the sub-group did not feel that there was sufficient information available or first hand experience within the group to ensure accurate documentation and independent validation of the flows. Client clearing flows were not produced for ICE Clear Europe and LCH as neither currently have live client clearing offerings.

Each of the below CCP work flows are followed by tables providing additional details in relation to the primary processing steps.

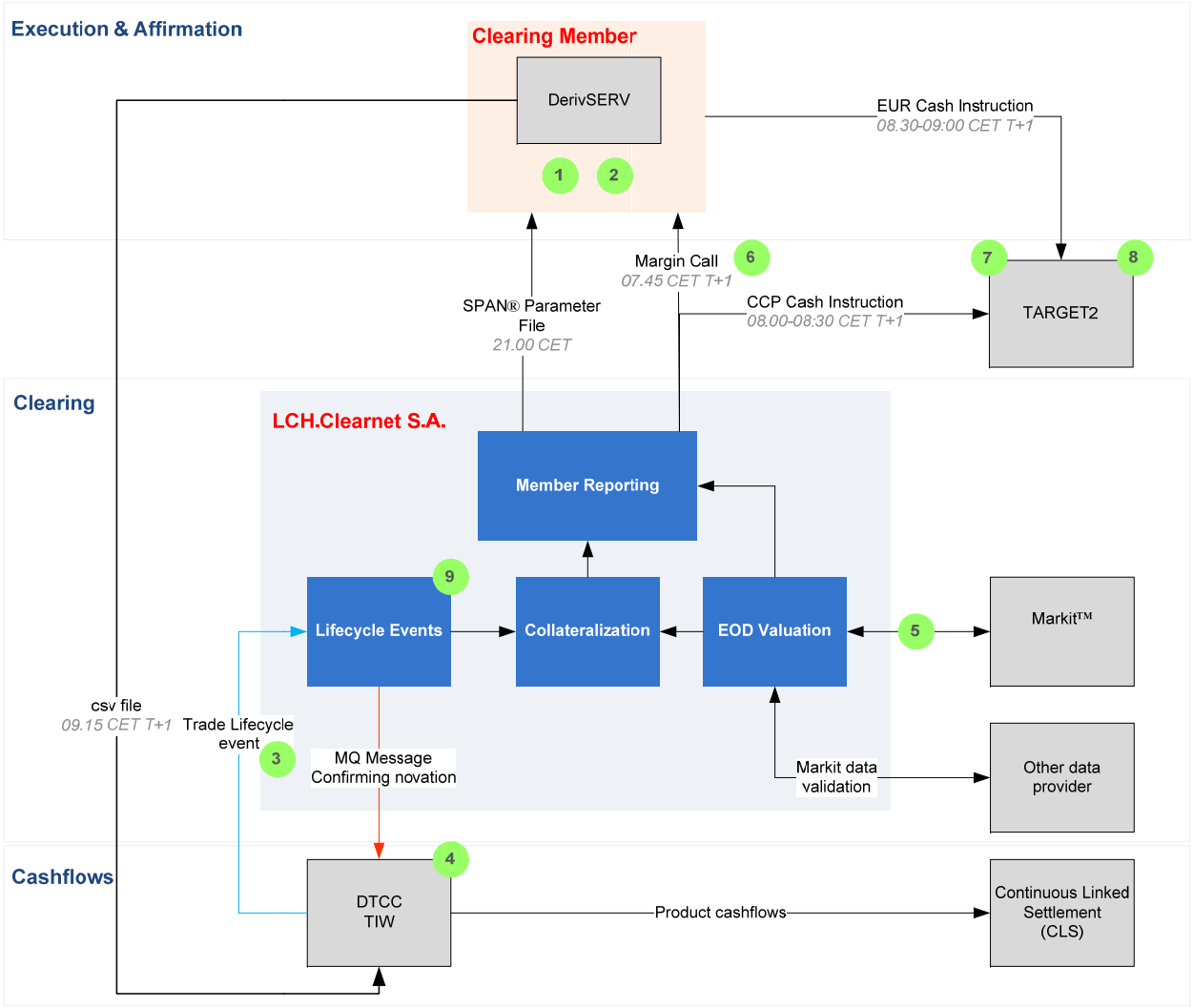
5.8.1 CME Client Clearing Current Model



The table below further details the processing steps for CME's Client Clearing Model (CME advise that the clearing work flow for their D2D model is identical to their D2C model):

Step No.	Title	Process
1	Execution	Execution of bilateral block trade between Client and EB is performed in CME ClearPort, Bloomberg VCON, MarkitSERV, Tradeweb and Javelin.
2	Affirmation	Affirmation is performed at execution or post execution via a recognized affirmation platform (E.g. ICE Link or MarkitSERV). CME will submit the trade to the CB via FEC. CB will accept/reject trade back to CME.
3	Submission & Approval	Once approved by the CB CME will notify all parties the trade has cleared through the ClearPort Clearing API. Trades submitted to CME Clearing via ClearPort progress through a series of states up to the point that they are either cleared or rejected. Clearing approval is communicated back to the EB and Client via the API and to CBs via MQ messaging. Trades that are cleared before 20:00 EST on T-0 will be included in that days clearing cycle.
4	Warehousing	EOD trade level reporting to DTCC TIW in extended copper format for regulatory reporting.
5	End Of Day Valuation	EOD valuation prices will rely primarily on CM price data points. The secondary sources will be used (e.g. Markit, CMA and/or Fitch) only if CME receives fewer than 4 valid CM price data points. USD price submissions are required to be submitted for clearable contracts by 16:35 EST to correspond with the New York market close. The final EOD settlement price file is published between 16:45 EST and 17:00 EST.
6	Margin Call	Initial margin ("IM") and variation margin ("VM") for T-0 trades is paid/collected from CMs in the following day's banking cycle at 08:30 EST (T+1). Trades cleared after 20:00 EST on T-0 are margined in the T+1 settlement cycle, and settled at 08:30 EST on T+2.
7	Settlement	End of day settlements, each bank agrees to provide its commitment by 08:30 EST the next day. Settlement banks as per process flow.
8	Margin Cover	As per the banking cycle in Step 7.
9	Lifecycle Events	CME does not support triggering or management of Strategic Restructuring Credit Events as its contracts eligible for clearing in NA do not include Restructuring. For Bankruptcy and FTP events, CME Clearing handles all downstream processing as it relates to the processing of Credit Events. CME adheres to the ISDA Determination Committee's ("ISDA DC") rulings for Credit Event & Succession Event determinations.

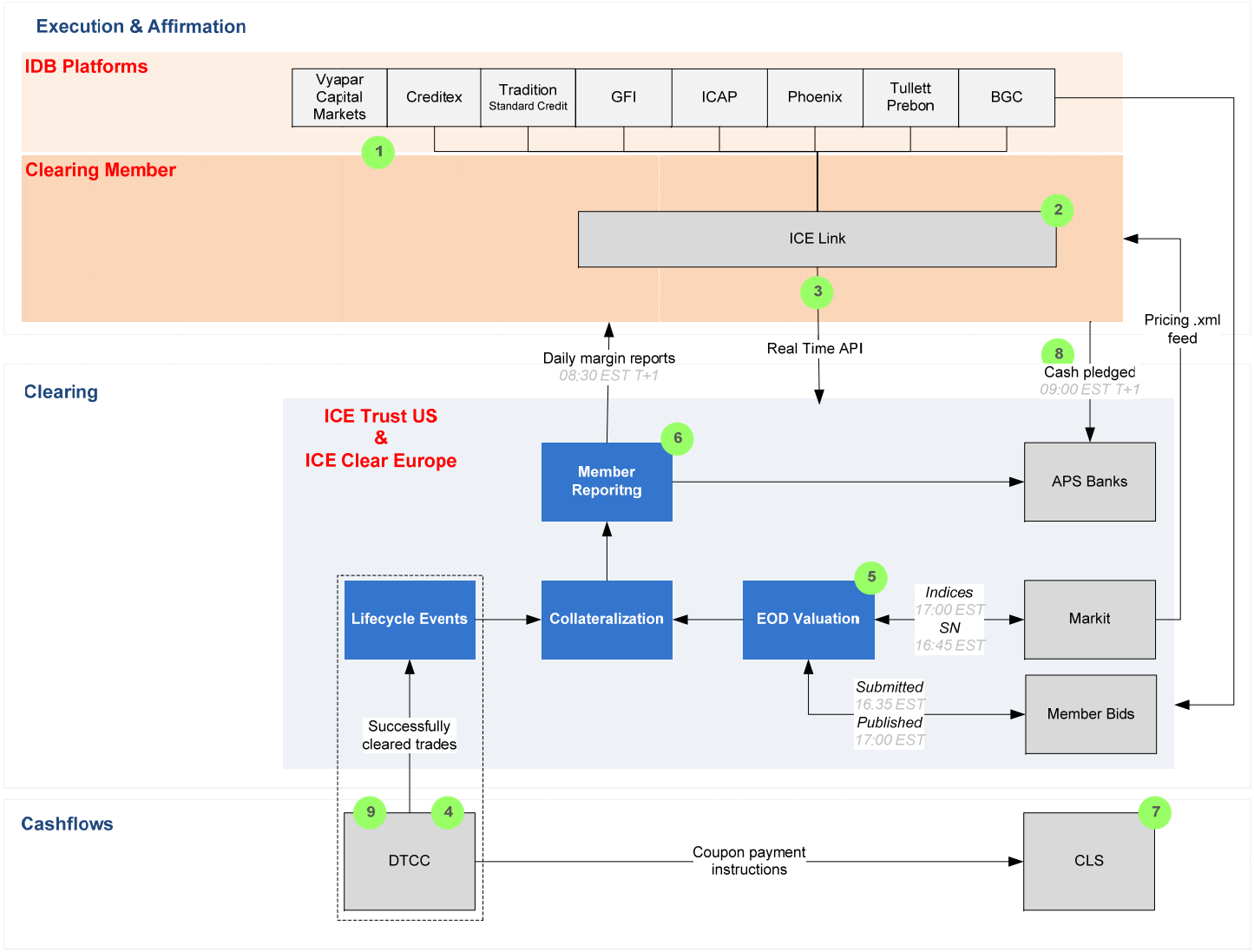
5.8.2 LCH Dealer to Dealer Current Clearing Model



The table below further details the processing steps for LCH's Current D2D Clearing Model:

Step No.	Title	Process
1	Execution	Agnostic upstream connectivity (will consider direct connectivity in the future); any CDS execution platform can be utilized provided the transaction is available for novation directly from the DTCC TIW.
2	Affirmation	Agnostic for affirmation, any CDS affirmation platform can be utilized provided the transaction is available for novation directly from the DTCC TIW. Trades are backloaded into LCH therefore there is no affirmation step in DSMatch.
3	Submission & Approval	All trades for novation to LCH.Clearnet are sourced directly from the DTCC TIW. DTCC send a CSV containing bilateral gold records in "Confirmed" status and flagged "LCH" prior to the nightly batch. LCH match the gold records to ensure clearing submissions exist from both counterparties. Bilateral trades are exited and cleared transactions are created. Rejected trades are notified to CMs via the Trade_Leg Member External Report. Novation occurs at 09:15 CET following receipt of margin from all CMs. Novation can be postponed to a later payment period if all margins are not received.
4	Warehousing	LCH sources transactions that already exist within the TIW for novation. Post novation LCH sends MQ Messages to update the DTCC TIW records to reflect novation. MQ Messages are the end-state solution for LCH with regards to DTCC/TIW. Currently LCH sends exit messages this is expected to change to exit messages and termination messages once they move to the intra-day novation model.
5	End Of Day Valuation	EOD clearing prices are sourced from Markit™ and compared with other data providers and other CCPs (LCH.Clearnet will implement an EOD dealer price contribution system towards end of 2011, using a work flow developed with Markit™ to obtain the prices to be used when calculating margin).
6	Margin Call	Following validation of TIW gold records the margin calculation is based on the portfolio of trades already cleared and new gold records presented. CM IM is calculated using LCH's SPAN® framework. Calls are processed through TARGET2 using available slots identified with Banque de France. The current T+1 daily batch novation model has one call daily unless margin was not received in the first payment cycle.
7	Settlement	EOD prices are used for the next business day settlements (margins+fees+clearing fund); each bank funds their TARGET2 account by 08:30 to 09:00 CET the next day via SWIFT. CCP cash flows are settled via SWIFT. Members have to fund their TARGET2 account (if necessary). LCH receives confirmation of payments via its paying agent CLS, for product cash flows (coupons, fees, premiums).
8	Margin Cover	Margin requirements can be covered in cash and a range of other collateral found in the CDS Rule Book. As financial flows are paid in advance, Price alignment interest on VM (cash only) is exchanged between members through the CCP so there is no VM held by the CCP.
9	Lifecycle Events	LCH support PTEs (including novations use cancel/rebook), Backloading & bilateral compression. The TIW is utilized to manage most other lifecycle events (Settlements, Succession Events, & Credit Events). LCH follow ISDA DC Determinations for Credit Events.

5.8.3 ICE Trust US & ICE Clear Europe Direct (Dealer to Dealer) Clearing Model

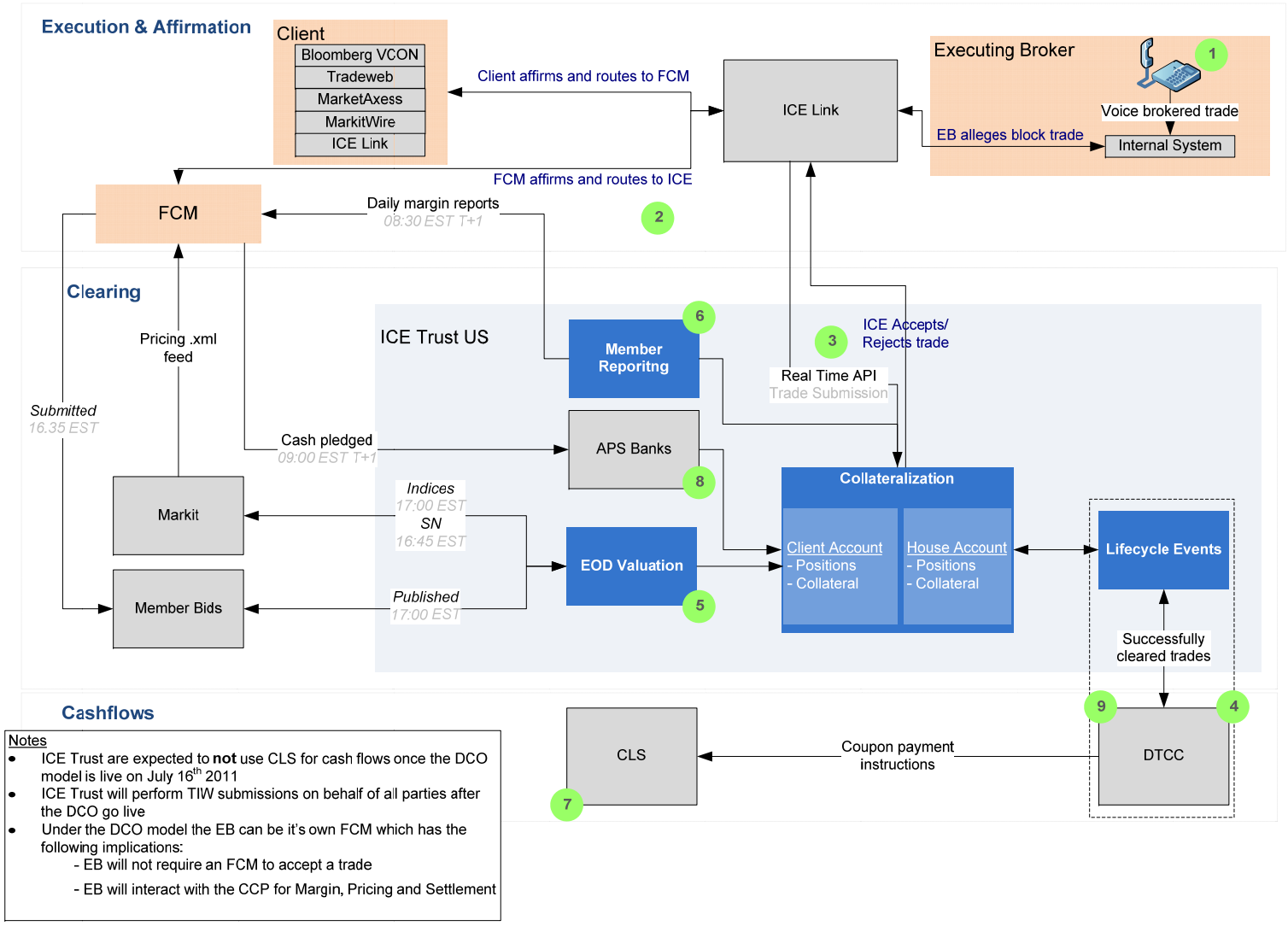


The table below further details the processing steps for both the ICE Trust US and ICE Clear Europe D2D Clearing Model:

Step No.	Title	Process
1	Execution	Execution is performed on IDB platforms: Vyapar Capital Markets, Creditex, Tradition (Standard Credit), GFI, ICAP, Phoenix, Tullett Prebon & BGC. At the affirmation stage each dealer will decide whether to send the trade for clearing.
2	Affirmation	Affirmation is performed in ICE Link at which point each party elects to send the trade to the CCP.
3	Submission & Approval	The ICE Link API routes the trade to the CCP in real-time and the CCP responds in real-time with acceptance or rejection.
4	Warehousing	Cleared trades are sent to the DTCC TIW by the CCP and the CM. Under the ICE Trust US DCO Model, the CCP will submit to the DTCC TIW on behalf of all parties.
5	End Of Day Valuation	Daily settlement prices on select liquid indices and 5 year Single Name CDS available to the public on www.theice.com. CMs receive the EOD settlement prices for every position in which they have open interest through the ICE .xml feed administered by Markit™. CMs have to submit EOD prices to ICE between 16:30-16:35 EST/GMT* and the CCP distributes prices to CMs by approximately 17:00.
6	Margin Call	CMs are contacted to indicate that funding may be necessary. If funding is subsequently required ICE's Treasury Team contacts the CM's Treasury Team detailing the amount of the call.
7	Settlement	EOD settlements, each bank agrees to provide its commitment by 8:30 EST/GMT the next day via Society for Worldwide Interbank Financial Telecommunication ("SWIFT").
8	Margin Cover	All margin requirements are collected daily at 09:00 EST/GMT T+1 via the CMs Assured Payment Service Account.
9	Lifecycle Events	Relating to Credit Events, Succession Events and renames: ICE adheres to any determination made by the ISDA Determinations Committee. ICE also adheres to Markit™ announcements of renames. The CCP adheres to DTCC TIW processing of events and all event processing is facilitated in the DTCC TIW

* Please note timings stated for ICE Trust US are" EST" and ICE Clear Europe "GMT."

5.8.4 ICE Trust US Client Clearing Current Model



The table below further details the processing steps for ICE Trust US's Client Clearing Model:

Step No.	Title	Process
1	Execution	EB executes block trade with client by voice execution or execution on an electronic platform such as Tradeweb, Bloomberg, or MarketAxess.
2	Affirmation	Affirmation / allocations are performed in ICE Link by the client and submitted to the FCM who affirms and submits the trade for clearing.
3	Submission & Approval	The ICE Link API routes the trade to the CCP in real time and the CCP responds in real time with acceptance or rejection. ICE Link notifies all parties of the acceptance / rejection by the CCP.
4	Warehousing	Cleared trades are sent to the DTCC TIW by the CCP and the CM. Under the ICE Trust US DCO Model[5], the CCP will submit to the DTCC TIW on behalf of all parties.
5	End Of Day Valuation	Daily settlement prices on select liquid indices and 5 year Single Name CDS available to the public on www.theice.com. CMs receive the EOD settlement prices for every position in which they have open interest through the ICE Trust US .xml feed administered by Markit™. CMs have to submit EOD prices to ICE between 16:30 and 16:35 EST/GMT and the CCP distributes prices to CMs by approximately 17:00.
6	Margin Call	CMs are contacted to indicate that funding may be necessary If funding is subsequently required ICE's Treasury Team contacts the CMs Treasury Team detailing the amount of the call.
7	Settlement	EOD settlements, each bank agrees to provide its commitment by 8:30 EST/GMT the next day via SWIFT.
8	Margin Cover	All margin requirements are collected daily at 09:00 EST/GMT T+1 via the CM's Assured Payment Service Account.
9	Lifecycle Events	Relating to Credit Events, Succession Events and renames: ICE Clear Europe adheres to any determination made by the ISDA Determinations Committee. ICE Clear Europe also adheres to Markit™ announcements of renames. The CCP adheres to DTCC TIW processing of events and all event processing is facilitated in the DTCC TIW.

* Please note timings stated for ICE Trust US are" EST" and ICE Clear Europe "GMT."

[5] References to ICE Trust's DCO Model refer to the future state Client Clearing Model.

6. APPENDICES

The following information has been included within the Appendix:

6.1 Other Public Domain Referenced Resources utilized:

CCP	Document Name	Date received
LCH	**CCP Questionnaire v10 LCH Population.**	20/04/2011
	Service Description CDS Clearing v3.1 Published February 2011	20/04/2011
	CCP Questionnaire v11 LCH Population2	22/04/2011
	ISDA Questionnaire Flow Diagrams.doc Attached flow diagram between Middleware and CCP set up by LCH.Clearnet SA	22/04/2011
	CCP Questionnaire v13 LCH Population2	02/05/2011
	Framework for ISDA PowerPoint detailing framework for Intraday Margin	06/05/2011
ICE	**ISDA CCP Questionnaire v15 - ICE**	15/04/2011
	ICE CDS Clearing Workflows Published April 15 2011	15/04/2011
	ICE Trust CDS Clearing DCO Model Published April 2011	Online resource
	ICE link – Clearing Services Factsheet Published 2011	Online resource
	CDS Clearing for Buy-side Market Participants FAQ	Online resource
	ICE v04 - ICE revised April 26 2011	26/04/2011
CME	**Clearing Comparative Analysis WG (Batch 2) Vf**	27/04/2011
	CME Trade Flow	27/04/2011
	Business Continuity Strategy at CME Group Final.	27/04/2011
	Cleared OTC CDS Buy-side Solution FAQ Published July 2010	Online resource
	Cleared OTC CDS Initiative "Protecting OTC Market Participants Through the Security of Centralized Clearing." Published April 2011	Online resource
Eurex	**CCP Questionnaire_Eurex Clearing**	21/04/2011
	Eurex Clearing - Eurex Credit Clear_ISDA questionnaire	21/04/2011