

# Capital Markets Special Interest Group

*Clearing Today & Clearing Tomorrow*

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# Agenda

1. Clearing
2. Scale and Scope of Clearing
  - a. Challenges
  - b. Proposed Solutions
3. Anatomy Of A Use Case- Robinhood & GME
4. The Solution
  - a. DLT in Clearing
  - b. Bilateral Netting
  - c. otc.Digital solution

# Clearing Today

1. Payment, Clearing & Settlement (PCS)
2. Post Trade
  - a. A Network of Participants (**Broker Dealers, Banks**)
  - b. Asset(s) Transferred Among Those Participants (**monetary instrument, security, commodity, or derivative**)
  - c. A Process With Procedures & Obligations managed through legal, risk management and governance processes involving Intermediaries
  - d. Messages between participants consist of electronic messages, acknowledgements, other information
  - e. Payments & Settlement can be operated through one entity
    - i. RTGS, Deferred Netting Settlement & Hybrid
  - f. CCP for pooling risk and creating shorter settlement windows, In exchange traded markets

From: CPSS-IOSCO Principles for Financial Market Infrastructures (2012), <http://www.bis.org/cpmi/publ/d101a.pdf>

# CCP

1. Buyer To Every Seller & Seller To Every Buyer
2. Risk Management Through Margins and Pooled Collateral
3. Default Risk Is Shared
4. Mark-To-Market losses and gains, plus collateral intra-day calls to manage current and potential future exposures

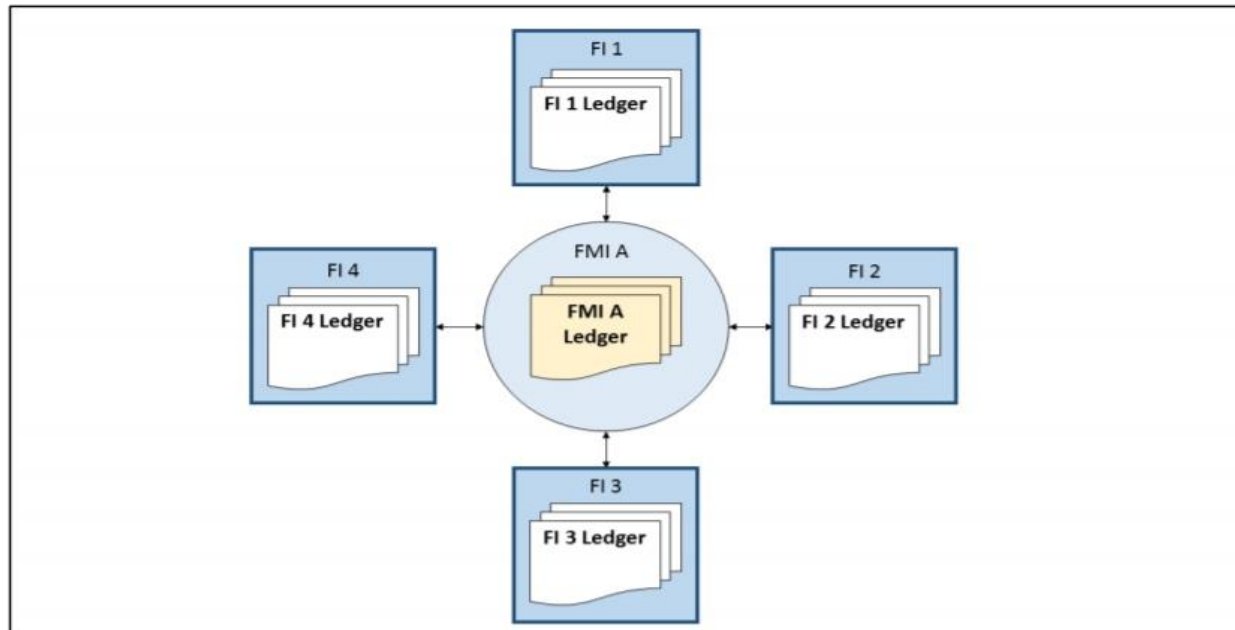


Figure 1: Simple example of a hub and spoke structure with one FMI and financial institutions (FIs) as participants

From: Mills, David, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016). "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>

# More Complex CCP Interactions

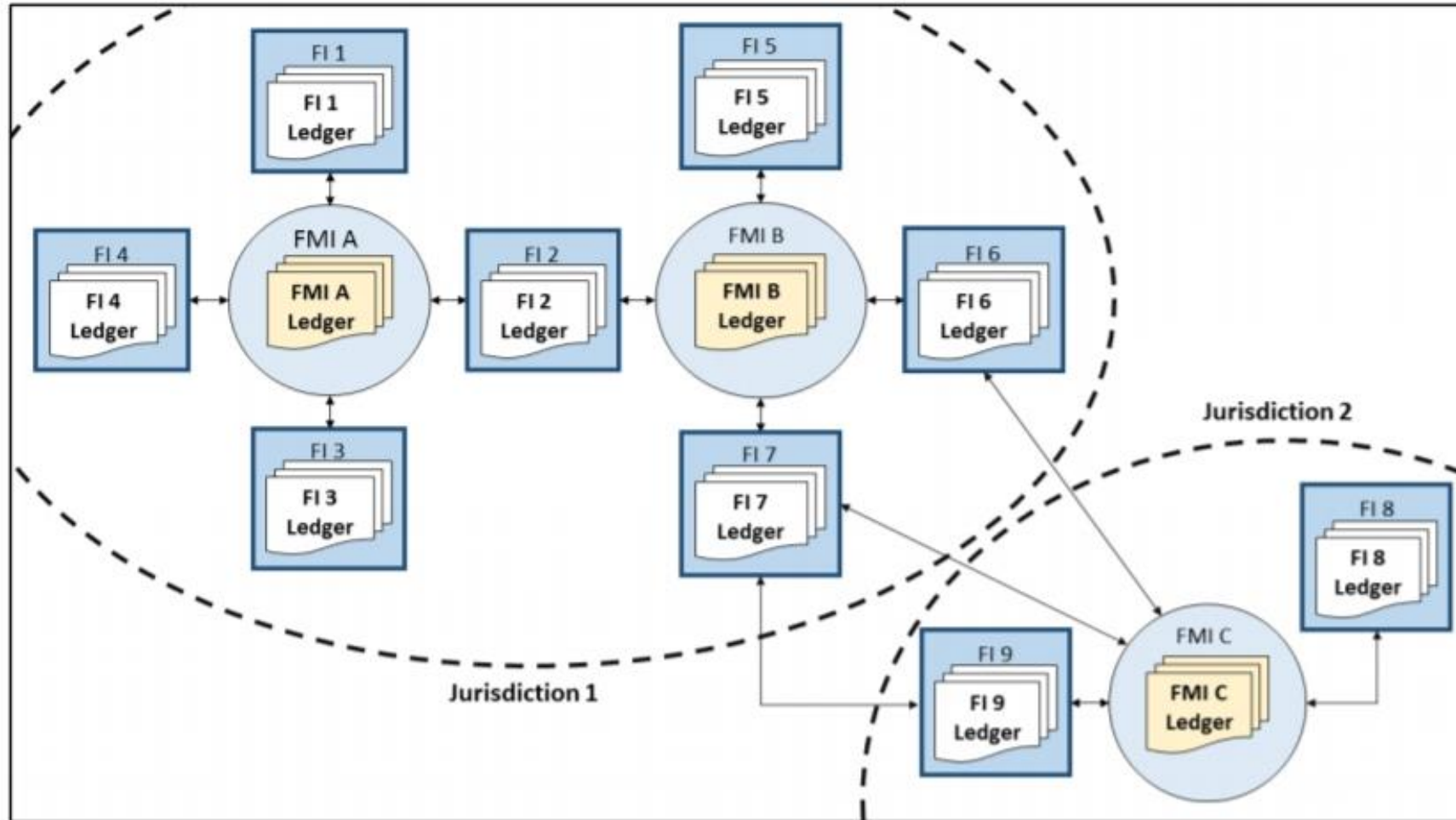


Figure 2: Example of a more-complex hub and spoke structure with multiple FMIs, FIs, and jurisdictions

# CCP - Challenges

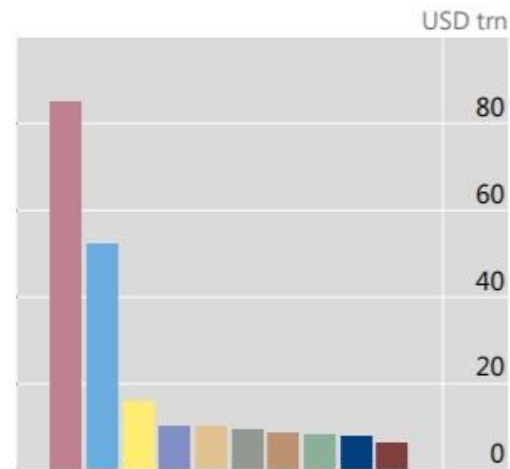
1. Settlement cycle length and delay increases risk
2. No 24/7 Trading due to pause for netting and settlement
3. Calls for regulatory capital may increase in times of heavy trading
4. Books and records are not timely. Beneficial ownership records are not accurate.

# RED BOOK STATISTICS

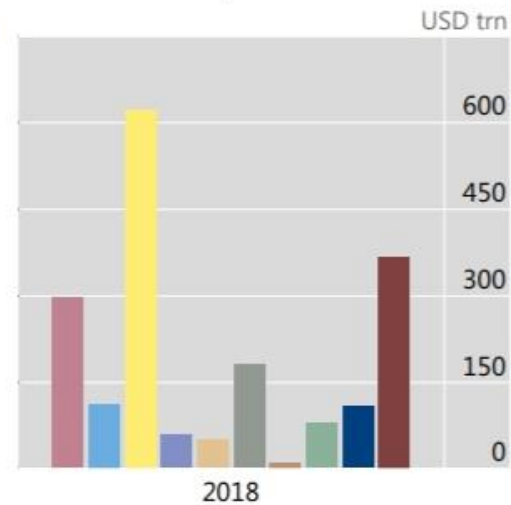
Securities held and delivered by selected CSDs/SSSs

Graph A1

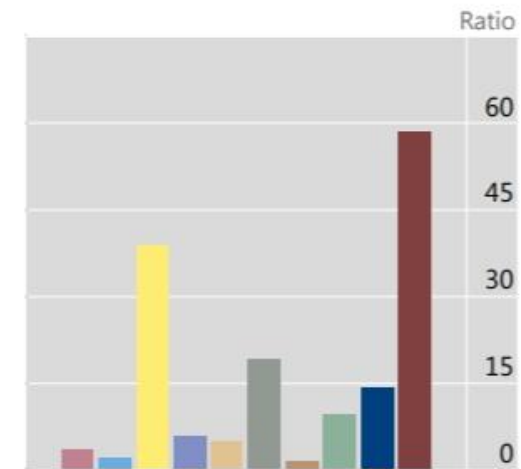
Value of securities held



Value of delivery instructions<sup>1</sup>



Value of deliveries to securities held



- Fedwire Securities Service (US)
- DTC (US)
- Euroclear bank (BE)
- Clearstream Banking Frankfurt (DE)

- JASDEC (JP)
- BOJ-NET JGB Services (JP)
- CDC depository and settlement system (CN)

- SD&C (CN)
- Euroclear France (FR)
- Euroclear UK & Ireland (GB)

<sup>1</sup> Flow of transactions in the CSD/SSS.

Source: BIS Red Book statistics.

# CALLS FOR CHANGE

[Clearing Firms Prevent 'Cascading Failures': Q&A With Larry Tabb](#) -Bloomberg  
Describing the current Infrastructure

## Calls For reform

- [Robinhood's GameStop Debacle Spurs Calls to Modernize Stock Clearing](#) -  
The time it takes clearinghouses to process U.S. stock trades has come under  
scrutiny-WSJ Feb 8
- GameStop case puts focus on market plumbing - FT Editorial on Feb 7th
- [Robinhood CEO, regulators to testify at House hearing on GameStop frenzy](#) -  
Announced for Feb 18



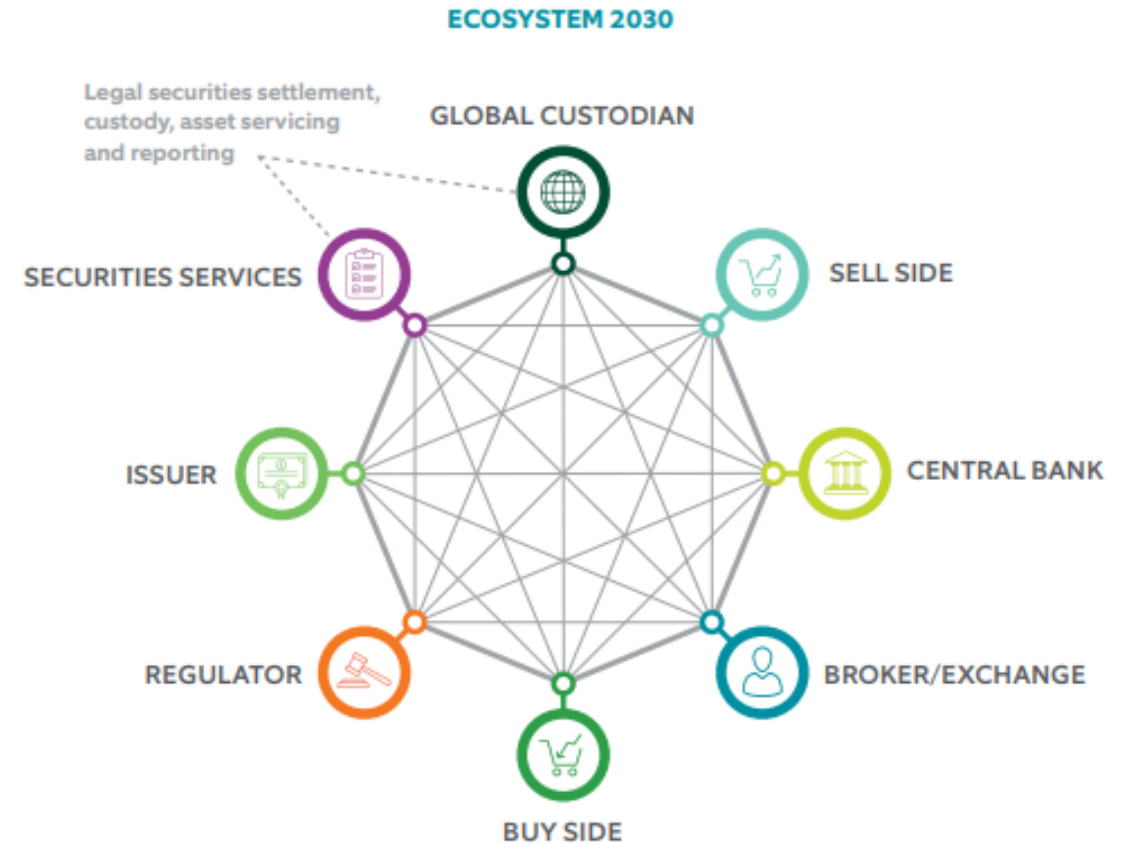
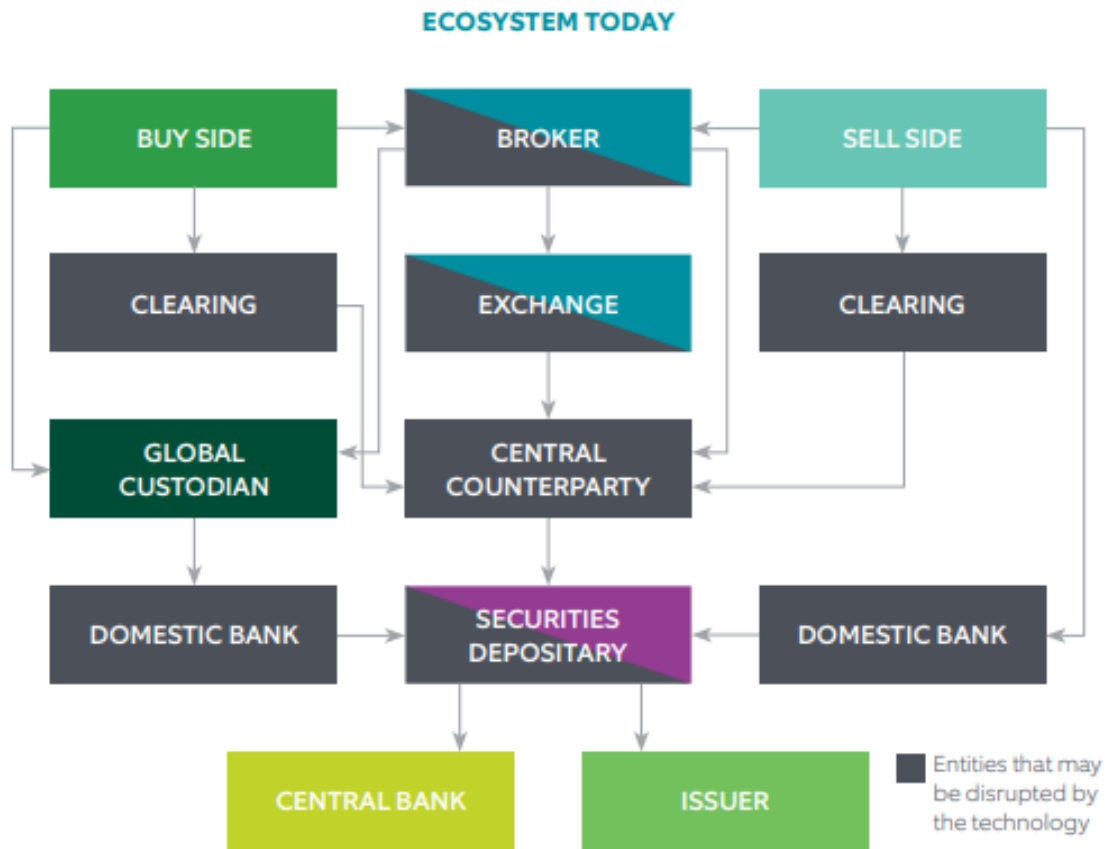
The background features a network diagram with white nodes and lines on a blue gradient. Various icons are scattered throughout, including a red circle with a white double-headed arrow, a US flag, a blue speech bubble, a train, a blue cube, a bicycle, a green diamond, a green plane, a grey envelope, a blue circle with a dollar sign, a blue circle with a cross, a green circle with a 'T', a blue circle with a 't', a blue circle with a 'D', a truck, a red circle with a white 'M', a red circle with a white triangle, a blue circle with a flower, a blue circle with a 'T', a yellow sun, and a blue circle with a 't'.

# otc\*Digital

Digital Assets network with full life cycle solution for Capital Markets

Reimagine, Rewire & Automate capital markets

# Equity Market Structure reimagedined



Source: Northern Trust whitepaper – custody re-imagined



# Centralized Clearing

				Party A				CCP				Party B						
Venue	Symbol	Qty	Price	IBM	MSFT	EXXON	USD		IBM	MSFT	EXXON	USD	RTGS	Netting	Netting Gain			
Exchange	IBM	1,000	120	1,000			(120,000)		(1,000)			120,000	120,000	120,000	0%			
ATS	MSFT	(1,500)	1,000		(1,500)		1,500,000			1,500		(1,500,000)	1,620,000	(1,380,000)	15%			
RFQ	EXXON	600	1,550			600	(930,000)				(600)	930,000	2,550,000	(450,000)	82%			
OTC	IBM	(700)	135	(700)			94,500		700			(94,500)	<b>2,644,500</b>	(544,500)	79%			
				300	(1,500)	600	544,500	Centralised Clearing Party	(300)	1,500	(600)	(544,500)						
Robinhood																		
Users	GameStop	Qty	Price	GME														
1-1000	GME	200,000	200	200,000			(40,000,000)											
1001-2000	GME	150,000	400	150,000			(60,000,000)											
2001-3000	GME	600,000	320	600,000			(192,000,000)											
				<b>950,000</b>			<b>(292,000,000)</b>											

On Jan. 28, after days of turbulence, the DTCC demanded significantly more collateral from member brokers on their GameStop trades. A spokesman for the DTCC wouldn't specify how much it required from particular firms but said that by the end of the day, industrywide collateral requirements jumped to **\$33.5 billion**, up from **\$26 billion**.

<https://www.bloomberg.com/news/articles/2021-01-29/what-s-the-dtcc-and-how-did-it-stop-gamestop-mania-quicktake?sref=8Gwybyo5>

Multilateral Netting gains can range from 4 to 8% (or 96% to 92% gains)



# Decentralized Clearing

Venue	Token	Qty	Price	Party A				Party B				RTGS	DeFi Netting	Netting Gain
				IBM	ESG-BOND	ETH	USDT	IBM	ESG-BOND	ETH	USDT			
Exchange	IBM	1,000	130	1,000			(130,000)	(1,000)			130,000	130,000	0%	
ATS	ESG-BOND	(1,500)	1,000		(1,500)		1,500,000		1,500		(1,500,000)	1,630,000	(1,370,000)	16%
RFQ	ETH	600	1,550			600	(930,000)			(600)	930,000	2,560,000	(440,000)	83%
OTC	IBM	(700)	135	(700)			94,500	700			(94,500)	<b>2,654,500</b>	(534,500)	80%
				300	(1,500)	600	534,500	(300)	1,500	(600)	(534,500)			
<b>DTCC</b>		<b>NSCC</b>	IBM	300			(35,500)	(300)			35,500			
		<b>FICC</b>	ESG-BOND		(1,500)		1,500,000		1,500		(1,500,000)			
		Does not clear ETH												
			P2P or Decentralized Clearing											
			D2C Clearing											
			D2D Clearing											
			Credit Utilization Advantage:			8hrs settlement vs 48 hrs (T+2) is 600%								
						4hrs vs 48hrs is 1200%								

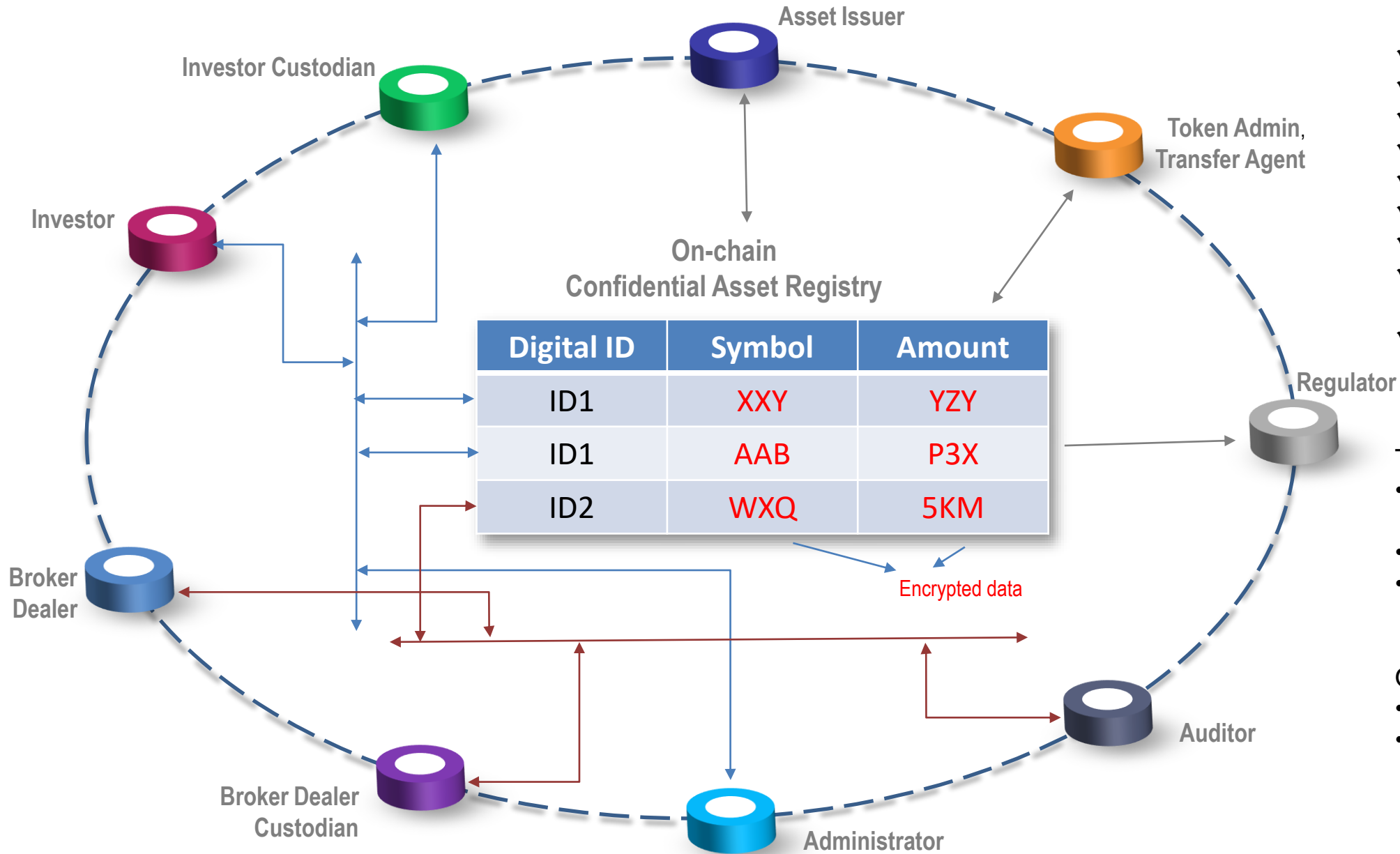


# Clearing Models comparison

	Centralized FMI	Regulated dFMI
<b>Settlement Duration</b>	T+2, T+1 M-F & Holidays	Session (RTGS, 4/8/12hrs, T+1 ...)
<b>Operational Time</b>	M-F (except holidays)	24 x 7
<b>Assets</b>	By Asset class (Equities, FI, Derivatives)	Mix any asset type bilaterally
<b>Liquidity</b>	High liquidity with asset class	High liquidity across asset classes
<b>Security</b>	SPF (Single point of failure)	decentralized (node count)
<b>Settlement Currency</b>	National currency	Any FIAT, Stable Coins, xCBDC or even T*vT*
<b>Data standard</b>	Customized FIX/ISO20022/FpML	Common Domain Model (CDM)
<b>Exchanges</b>	Nationally approved	Any exchange (CEX/DEX) that meets regulations
<b>Credit Risk</b>	Multilateral	Bilateral (can be multilateral with restrictions)
<b>Default Fund / IM</b>	centralized with predefined assets	Bilateral and Default funds (IM) can be any asset



# Capital Markets Cash Securities dFMI



## Regulatory Compliant Features

- ✓ ID Based Blockchains
- ✓ Revertible/clawbacks
- ✓ KYC/AML
- ✓ Lockups
- ✓ Settlement Finality
- ✓ Dual party settlement
- ✓ No forks/air drops
- ✓ Travel Rules
  
- ✓ Native & DR tokens

## Tech:

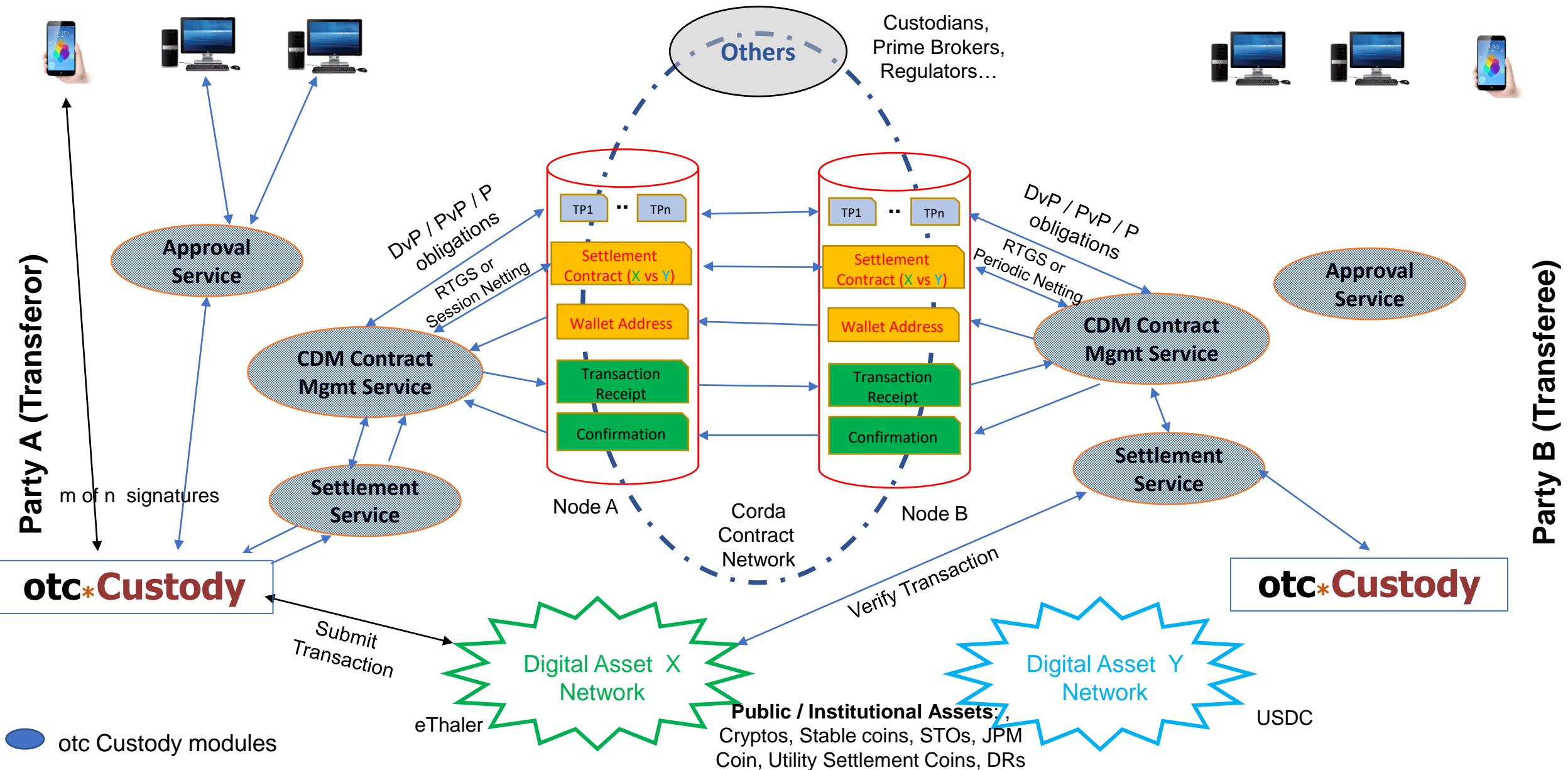
- Polkadot based
- Polymath
- ZKP
- Homomorphic Encryption

## Others:

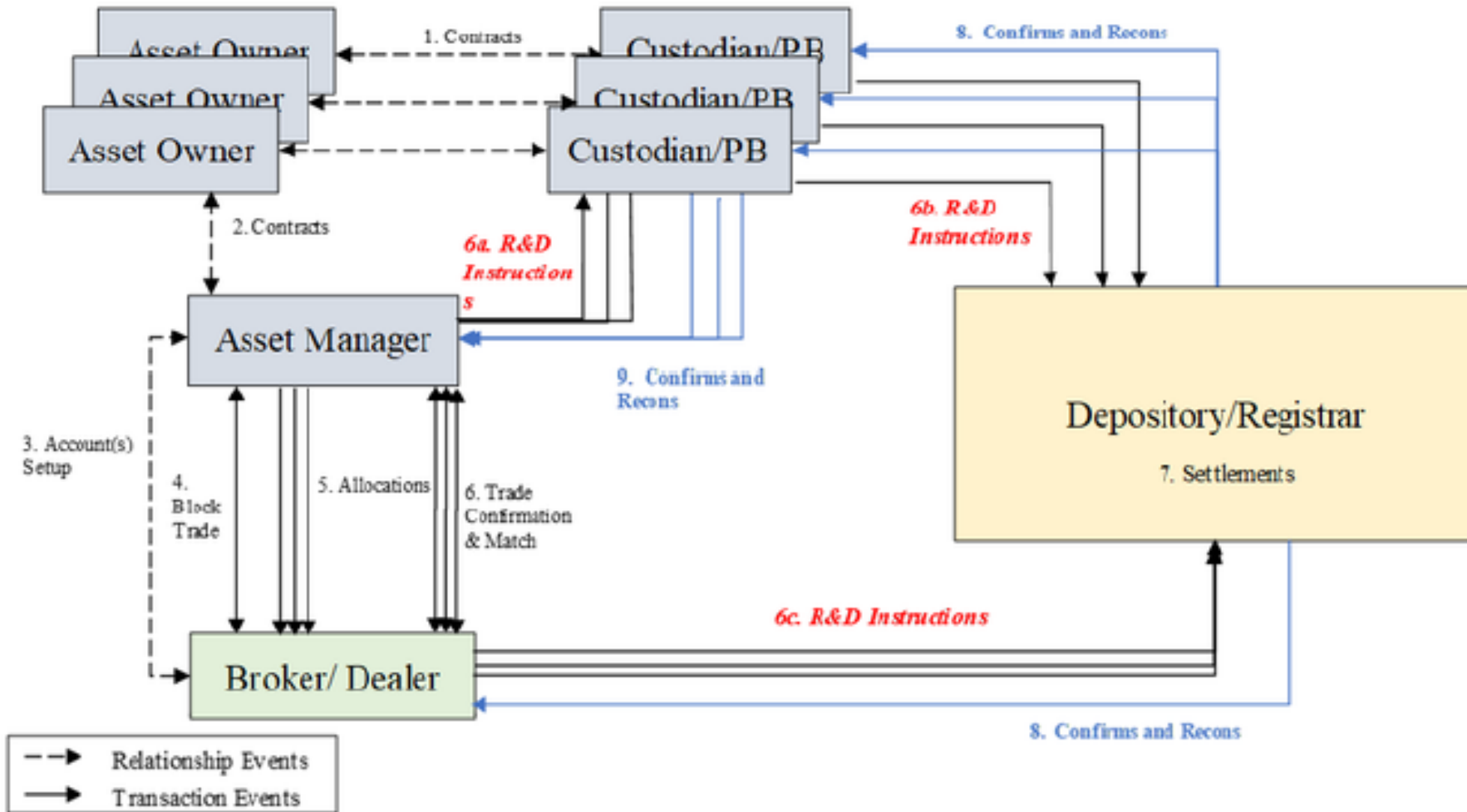
- Securitize
- Tokeny/TokenSoft



# Decentralized Clearing using CDM, BC, DLT and Secured Custody with Threshold Signatures



## Traditional Asset Manager Trade and Settlement Information Flow



*These steps can only be performed by an authorized party. The receiver will only follow authenticated instructions from an authorized party.*