

# CORDA Introduction to Case Studies

# About ISiD

- Established in 1995, as a joint venture between Dentsu and GE
- Global network of 11 overseas bases in 7 countries. 2,500+ employees.
- Became a Alliance partner with R3



# Agenda

## **1 . CORDA Introduction**

1. Introduction(movie)
2. Why Corda?
3. Corda Overview
4. Roadmap 2017
5. Usecase

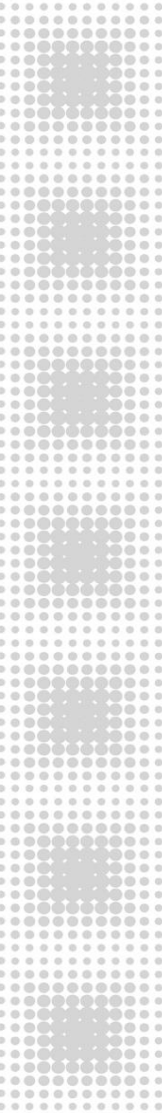
## **2 . ROD Project**

1. ROD Overview

# CORDA : Distributed Ledger Technology

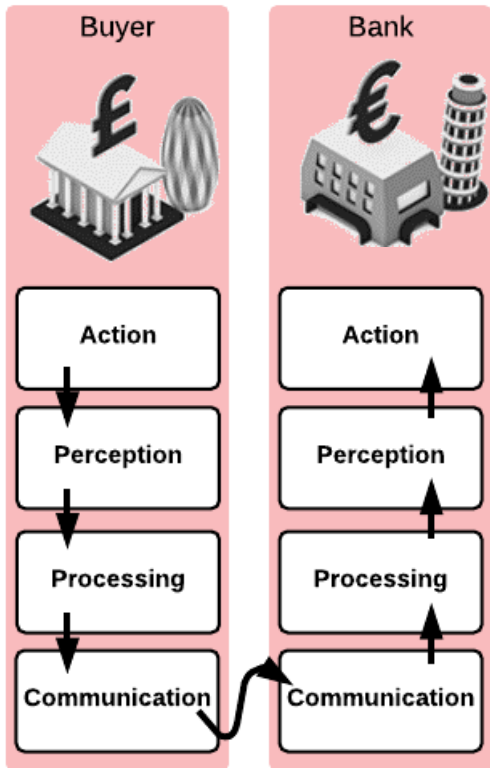
# Meet Corda: DLT with a difference

**movie1**

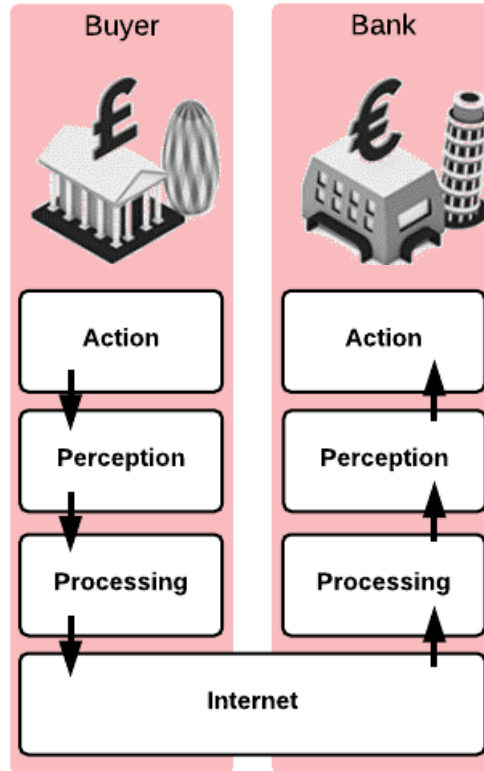


# Why Corda?

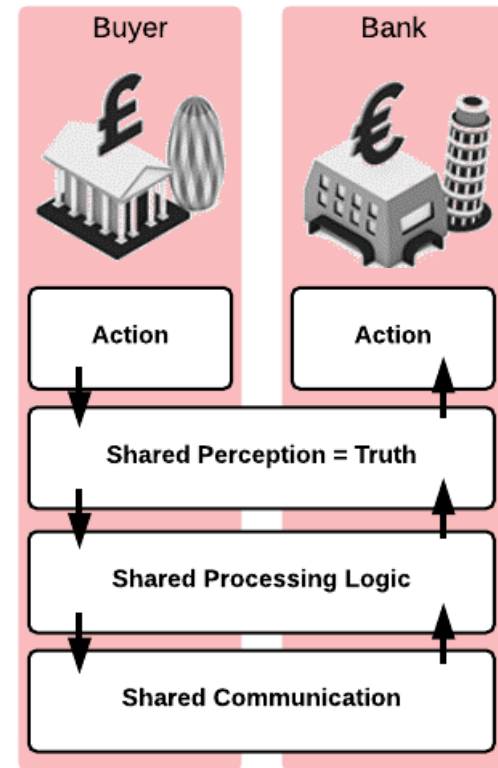
*Enables distrusting parties to reach an agreement on a set of shared facts, status and its evolution*



Before the Internet



Now

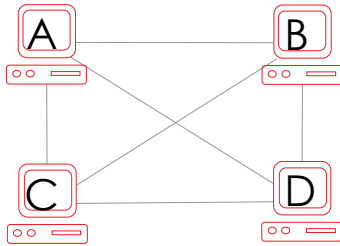


After Shared Ledgers

# Why Corda?

## Broadcast Blockchain

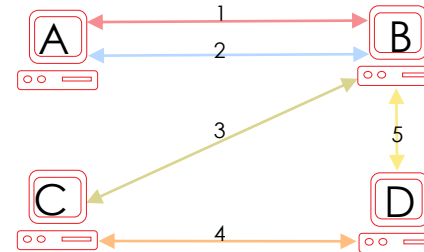
Bank A's Ledger		Bank B's Ledger	
ID	Fact	ID	Fact
1	Bank A pays bank B \$5.	1	Bank A pays bank B \$5.
2	Bank B purchases bond X from issuing bank A.	2	Bank B purchases bond X from issuing bank A.
3	Bank C purchases bond X from bank B.	3	Bank C purchases bond X from bank B.
4	Bank C enters a credit default swap with bank D.	4	Bank C enters a credit default swap with bank D.
5	Bank D owes bank B \$10.	5	Bank D owes bank B \$10.



Bank C's Ledger		Bank D's Ledger	
ID	Fact	ID	Fact
1	Bank A pays bank B \$5.	1	Bank A pays bank B \$5.
2	Bank B purchases bond X from issuing bank A.	2	Bank B purchases bond X from issuing bank A.
3	Bank C purchases bond X from bank B.	3	Bank C purchases bond X from bank B.
4	Bank C enters a credit default swap with bank D.	4	Bank C enters a credit default swap with bank D.
5	Bank D owes bank B \$10.	5	Bank D owes bank B \$10.

## Corda DLT

Bank A's Ledger		Bank B's Ledger	
ID	Fact	ID	Fact
1	Bank A pays bank B \$5.	1	Bank A pays bank B \$5.
2	Bank B purchases bond X from issuing bank A.	2	Bank B purchases bond X from issuing bank A.
		3	Bank C purchases bond X from bank B.
		5	Bank D owes bank B \$10.



Bank C's Ledger		Bank D's Ledger	
ID	Fact	ID	Fact
		3	Bank C purchases bond X from bank B.
		4	Bank C enters a credit default swap with Bank D.
		5	Bank D owes bank B \$10.

# Comparison with other DLT

#	Item	Public		Private	
		Bitcoin	Ethereum	Fabric v1.0	Corda
1	Purpose	Censorship resistant digital cash payment	Execute smart contract on a distributed network	Design for variety of use cases in business	Enterprise grade platform for financial transaction
2	Participation	Anyone	Anyone	Permissioned network	Permissioned network
3	Data sharing model	Broadcast	Broadcast	"Need-to-know" basis (within channels)	"Need-to-know" basis
4	Transaction validation	Proof of Work	Proof of Stake	Chaincode by channel	Contract code by transaction
5	Smart contracts	Limited, deterministic	Turing-complete	Turing-complete	Turing-complete
6	Crypto currency	Yes	Yes	No	No
7	Legal prose	"Code is law"	"Code is law"	"Code is law" (Chaincode)	Attaching legal prose
8	Consensus	Proof of Work	Proof of Stake	Chaincode + Orderer	Uniqueness service
9	Transaction style	UTXO Model	Account base	UTXO + Account base	UTXO model
10	インテグレーション	Python, LLL	Solidity	Go	Kotlin, Java, RDBMS(SQL)
11	Virtual machine	Native code	Ethereum virtual machine	Native code	The Java virtual machine
12	Regulatory requirement	No	No	No	Enable regulatory nodes
13	Disaster recovery (DR)	Restore from peers	Restore from peers	Restore from peers	Utilize existing RDBMS
14	Workflow	-	-	None	Flow framework
15	Interoperability	-	-	Closed network (channel)	Interoperable with Corda peers



# What is Corda

*Purpose : Build an enterprise grade platform specialized in financial transaction*

## Data Sharing Model

→ "Need-to-know" basis, No broadcasting

## Transaction validation

→ Validated by parties to the transaction, No Block, No PoW

## Consensus

→ Uniqueness service provided

## Transaction style

→ UTXO model employed, Execute in parallel

## Regulatory requirement

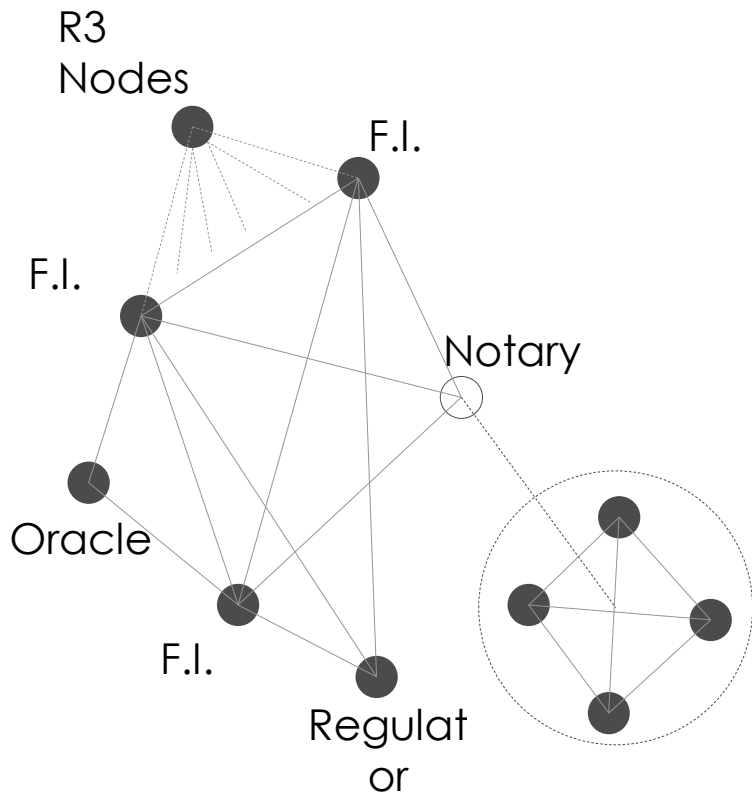
→ Enable regulatory nodes, ensuring transparency

## Integration

→ Kotlin, Java, RDBMS, easy integration with existing systems

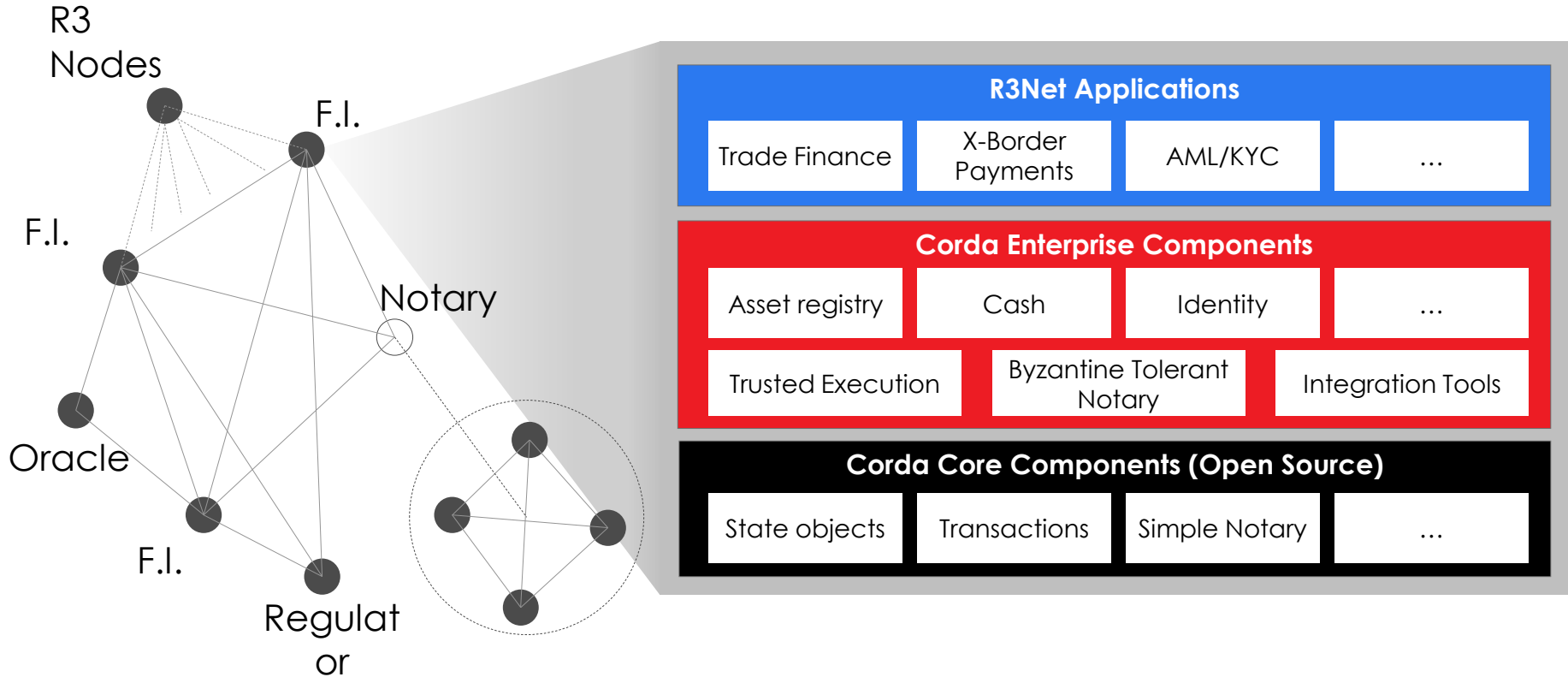
# About R3-Net

- Distributed private network run by R3 (In progress)

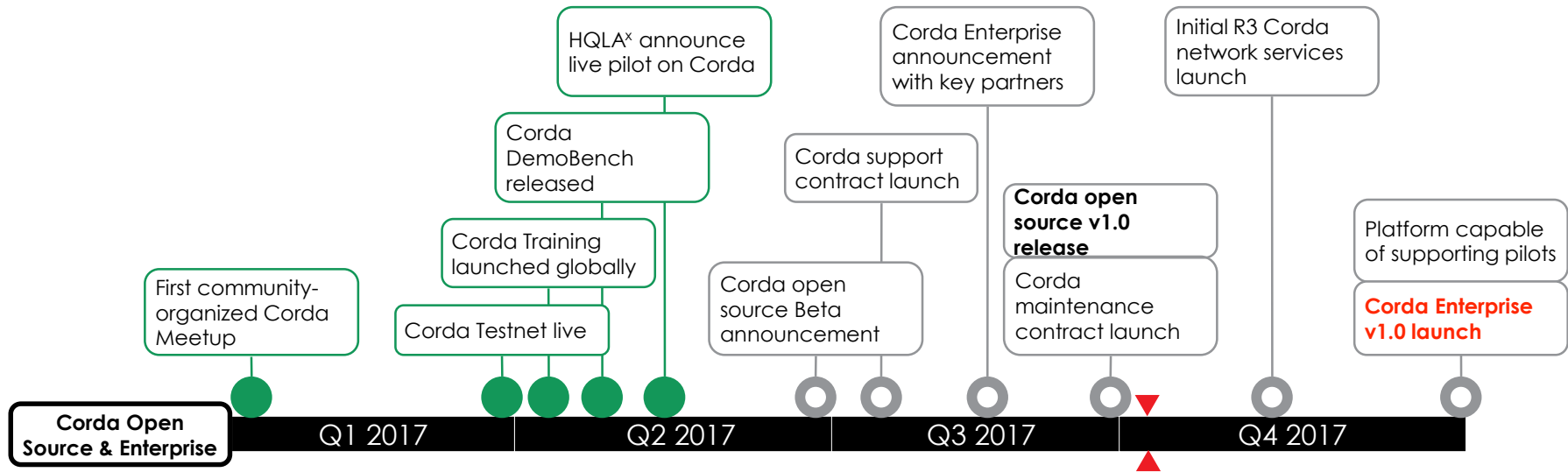


#	Network participants	Description
1	R3 Nodes	<ul style="list-style-type: none"> <li>Provides membership functions</li> <li>Issue a SSL/TLS certificate</li> <li>Distribute IP address to each node(Networkmap service)</li> </ul>
2	F.I. (Financial institution)	<ul style="list-style-type: none"> <li>F.I.s transact each other in any type of financial agreements.</li> </ul>
3	Oracle	<ul style="list-style-type: none"> <li>Provide external facts such as interest rate, foreign exchange rate, etc.</li> <li>Think of Tomson Reuters and Bloomberg.</li> </ul>
4	Notary	<ul style="list-style-type: none"> <li>Prevent double spending</li> <li>Provide signatures when a peer commit a transaction</li> </ul>
5	Regulator	<ul style="list-style-type: none"> <li>Receive all the transactions within their jurisdictions</li> <li>Real-time monitoring</li> <li>Regulatory reporting</li> </ul>

# Node internals



# Roadmap 2017



## R3 unlocks regulatory reporting on Corda with Financial Conduct Authority and two global banks

12 September 2017 | 2147 views | 0 

Source: R3

Engaging FCA

**Enterprise software firm R3, the Financial Conduct Authority (FCA), RBS and another major global bank have built a prototype application for regulatory reporting of mortgage transactions on R3's Corda distributed ledger technology (DLT) platform.**

This unique collaboration between two major banks and a national regulator demonstrated how DLT's shared data model can enable continuous regulatory reporting for financial institutions. The application is also able to generate automated delivery receipts for the regulator when a mortgage is booked.

<https://www.finextra.com/newsarticle/31107/commerzbank-completes-money-market-transaction-over-r3-corda>



# Use case

## Mizuho completes DLT-based trade finance transaction

07 July 2017 | 19346 views | 0



Pilot transaction of LC

Mizuho has completed a trade finance transaction between Australia and Japan, digitising all necessary documentation and sharing the data with multiple participants across a distributed ledger.

Mizuho collaborated with Marubeni Corporation and Sompo Japan Nipponkoa Insurance on the project, which saw all trade-related

<https://www.finextra.com/newsarticle/30804/mizuho-completes-dlt-based-trade-finance-transaction/blockchain>

## R3 and 12 banks plan overhaul of open-account trade finance

26 September 2017 | 6742 views | 0



Open account transaction

Blockchain consortium R3 is collaborating with 12 banks and technology vendor TradeIX on an open-account trade finance project for corporate buyers and sellers around the world.

R3, TradeIX and the participating banks - Bangkok Bank, Barclays, BBVA, Bladex, BNP Paribas, Commerzbank, CTBC Bank, ING, Intesa Sanpaolo, Shinhan Bank, Royal Bank of Scotland and Wells Fargo - are

<https://www.finextra.com/newsarticle/31113/r3-and-12-banks-plan-overhaul-of-open-account-trade-finance/transaction>

# Use case

## New DLT consortium forms for syndicated lending market

05 October 2017 | 3267 views | 0



Pilot transaction of syndicated loan

A consortium of fintechs and banks has developed a distributed ledger technology (DLT) platform for the syndicated lending market.

The online marketplace, named Fusion LenderComm, is designed to bring more transparency and efficiency to the heavily manual loan

<https://www.finextra.com/newsarticle/31153/new-dlt-consortium-forms-for-syndicated-lending-market>

## Commerzbank completes money market transaction over R3 Corda

25 September 2017 | 3651 views | 0



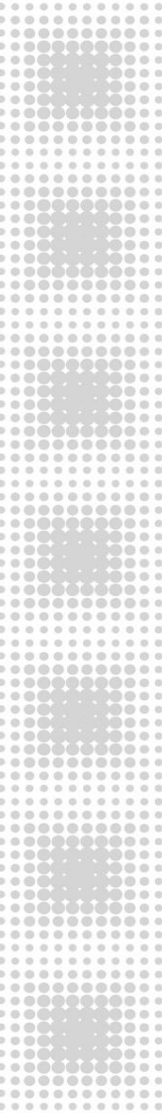
Pilot transaction of CP

Germany's Commerzbank has hailed the potential of blockchain technology for money market trades, having successfully replicated a EUR100,000 Euro Commercial Paper transaction with a limited number of trading partners.

The security, comprising a €100,000 issuance volume with a five-day term, was sold to asset management group MEAG, and settled without a paying agent or a clearing system.

<https://www.finextra.com/newsarticle/31107/commerzbank-completes-money-market-transaction-over-r3-corda>

# ROD Overview





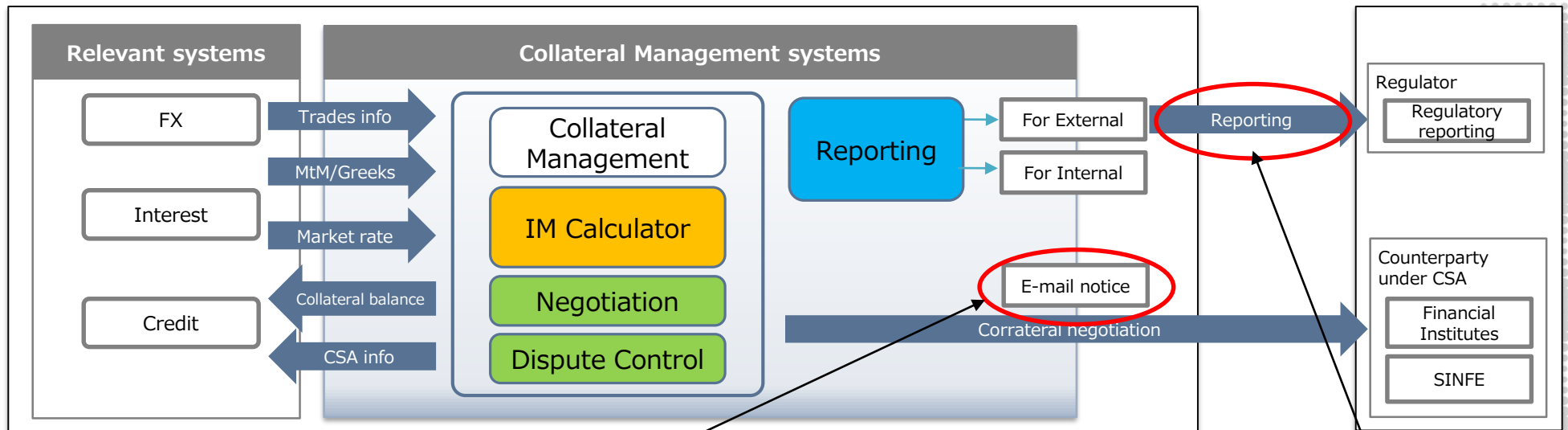
# Background

Margin requirements for non-centrally cleared derivatives were started in stages in Japan from September 2016.

Margin	Notional Amount	Sep /2016	March /2017	Sep /2017	...	Sep /2018	...	Sep /2019	...	Sep /2020
Variation Margin (VM)	Over \$ 3 trillion	★apply (daily)								
	Others		★apply (daily)							
Initial Margin (IM)	Over \$ 3 trillion	★apply (daily)								
	Over \$ 2.25 trillion	3 mega banks And Nomura		★apply (daily)						
	Over \$ 1.5 trillion			Securities Insurance		★apply (daily) Middle				
	Over \$ 0.75 trillion						★apply (daily) Middle			
	Over \$ 8 billion								★apply (daily) Regional bank	

# Current Collateral Management

As a response to the margin regulation, each bank establishes a collateral management system and collateral negotiations with counterparties are individually handled.



Calculation

• Calculate IM/VM using parameters from relevant systems

Collateral negotiation

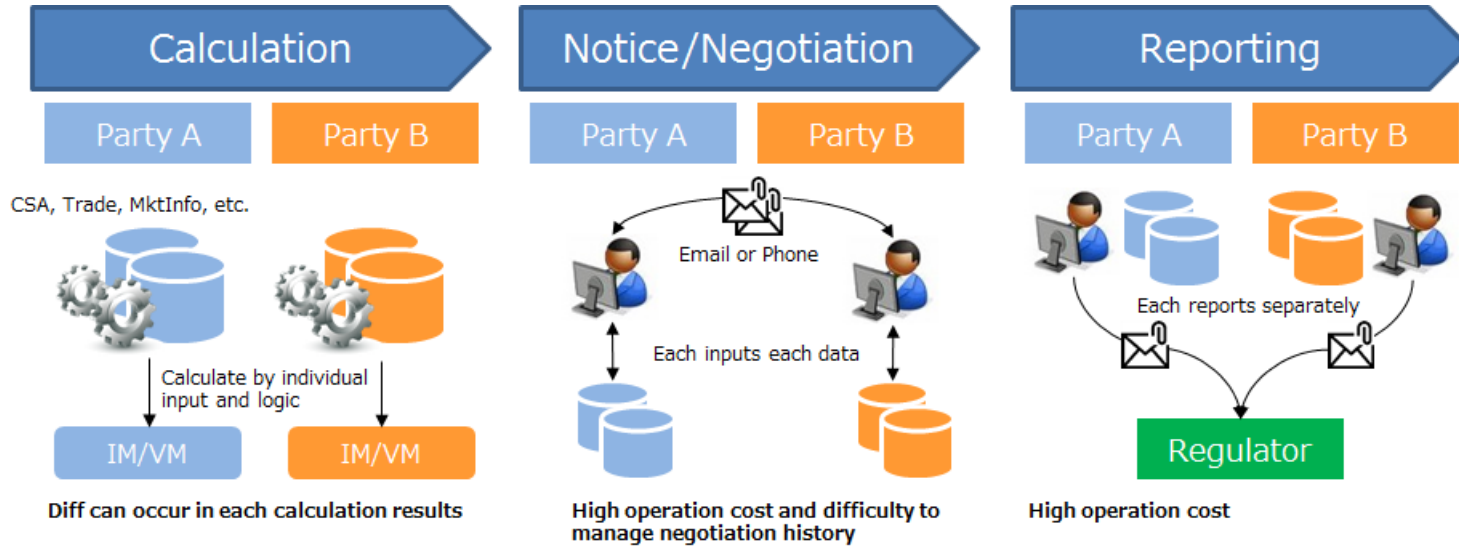
**Currently, negotiations are handled by e-mails and telephone with counterparty, and input manually.**

Reporting

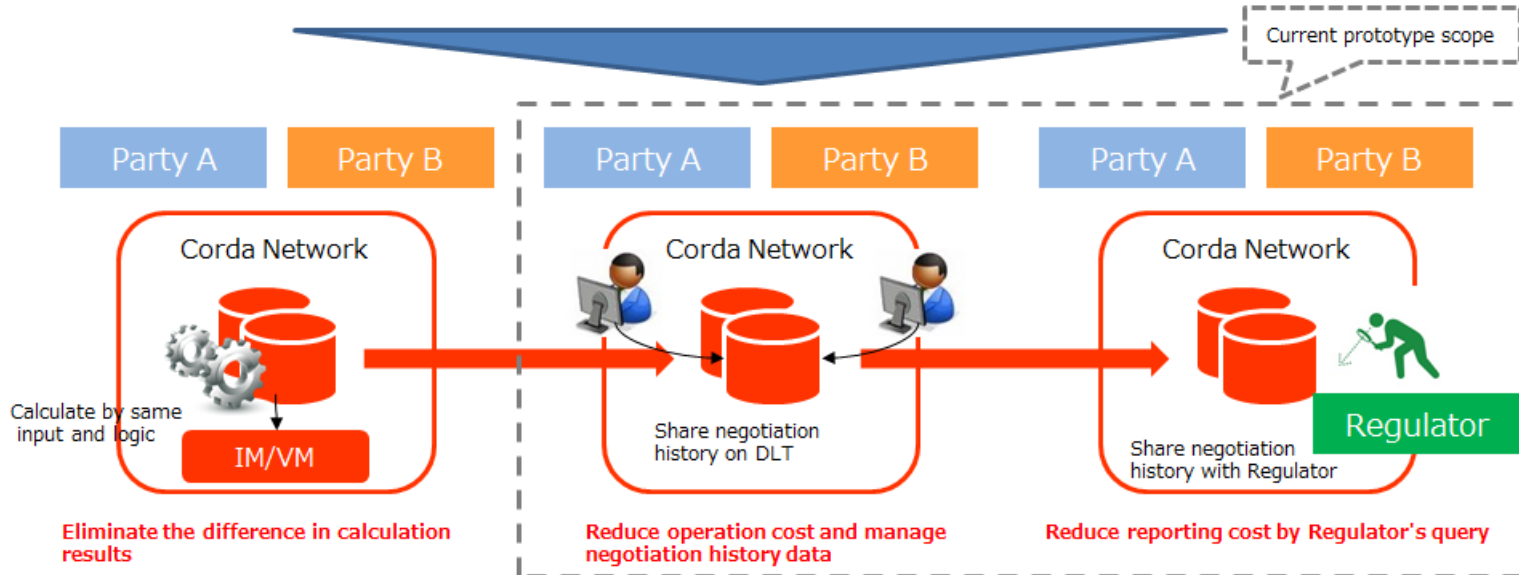
**Reporting flow with Regulator has not been established.**

# Future Collateral Management

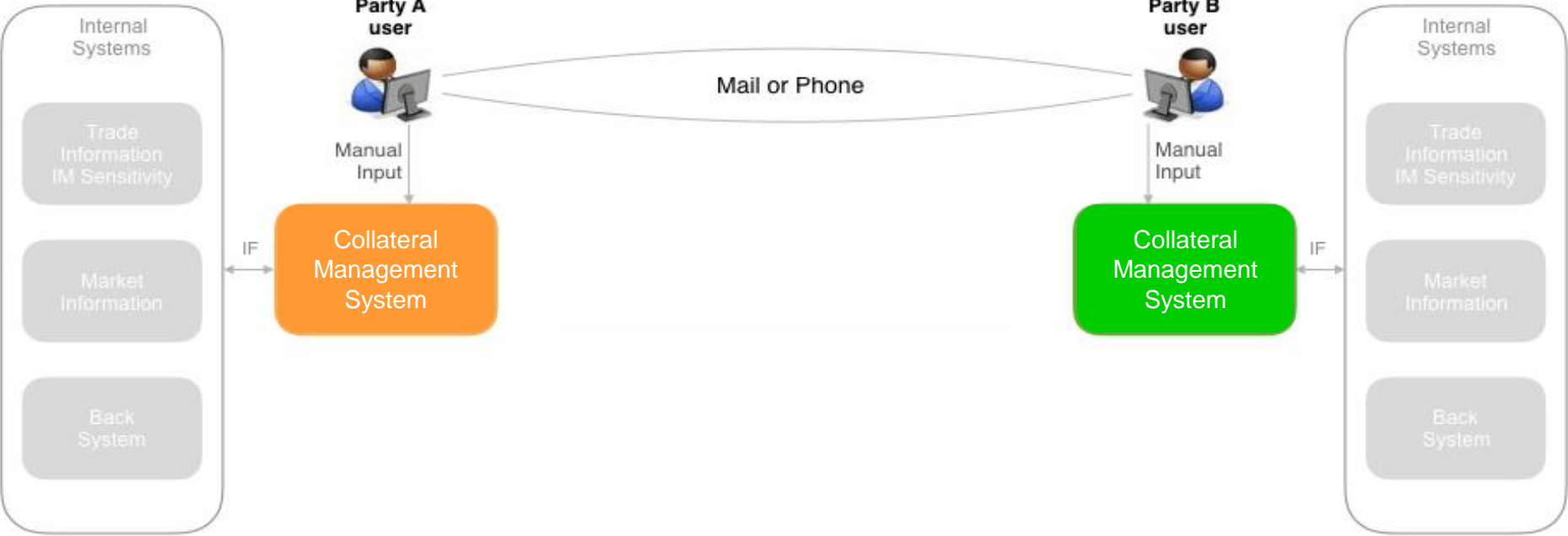
AS IS



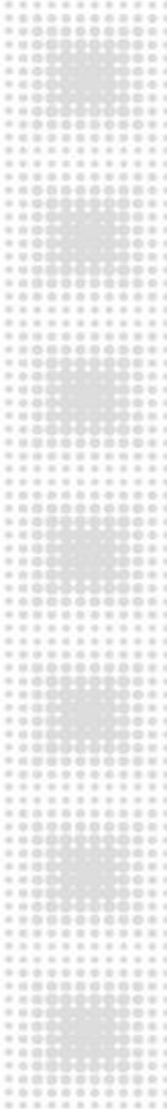
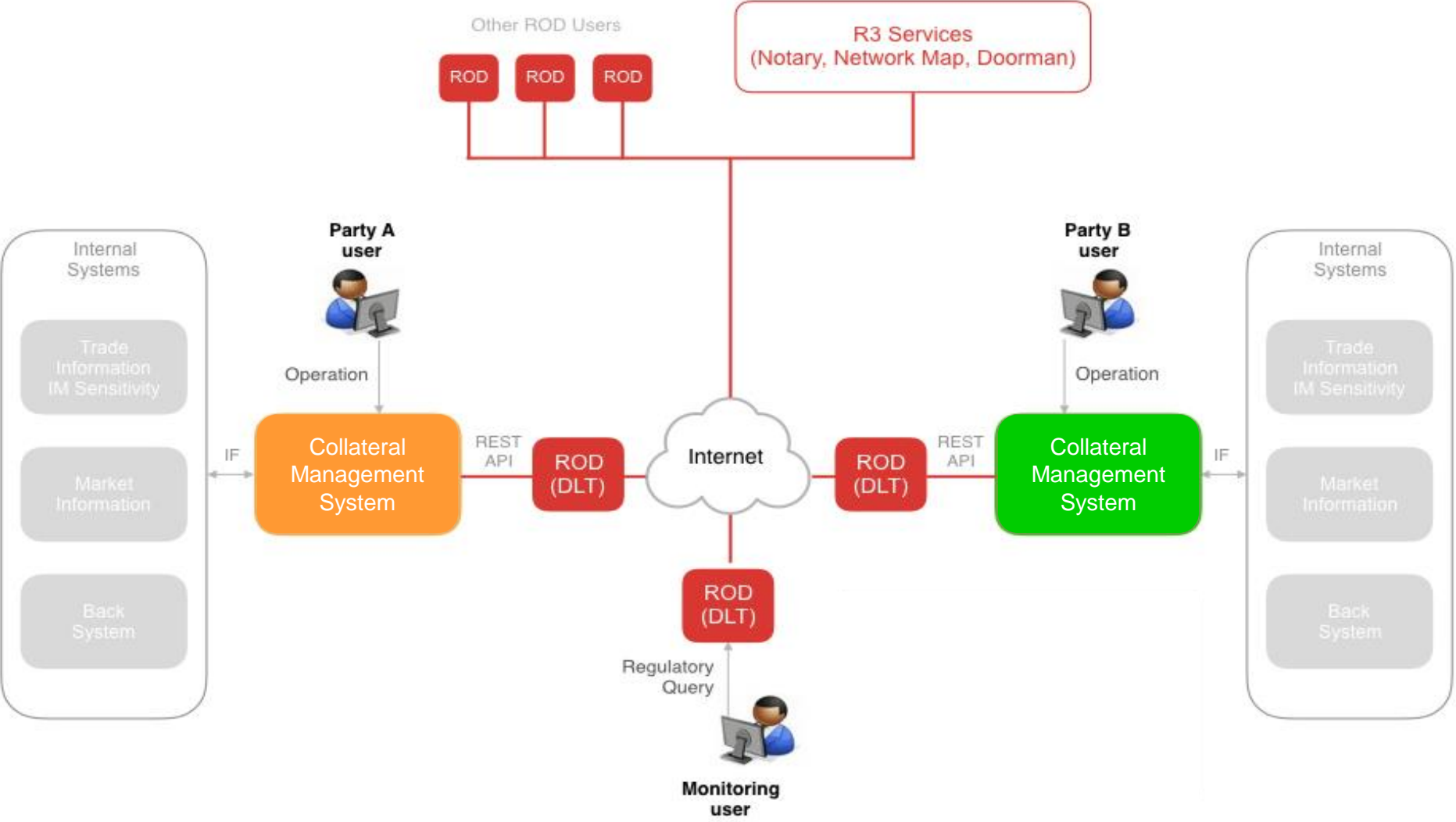
Future



# Introduction image(ASIS)



# Introduction image(Future)



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