Kickstart Your Corda Blockchain Journey with R3

Agenda

- 4:40 - 4:50PM R3 Introduction & Vision
- 5:00 - 5:20PM Corda Introduction & Architecture
  - Network, Consensus, Notary, Node
- 5:20 - 5:40PM Corda Smart Contract (CorDapps)
- 5:40 – 5:50PM Corda Application demo (privacy via P2P)
- 5:50 – 6:00PM Q & A

R3 Timeline

SEPT. 2014 | First R3 roundtable held in NY; attended by eight banks to understand blockchain

SEPT. 2015 | Nine banks form a partnership with R3 to design and deliver advanced DLTs to global financial markets

SEPT. 2015 | R3 launches the Architecture Working Group to architect an enterprise-grade blockchain

DEC. 2015 | R3 consortium grows to 42 bank members

NOV. 2016 | Corda Open Source GA

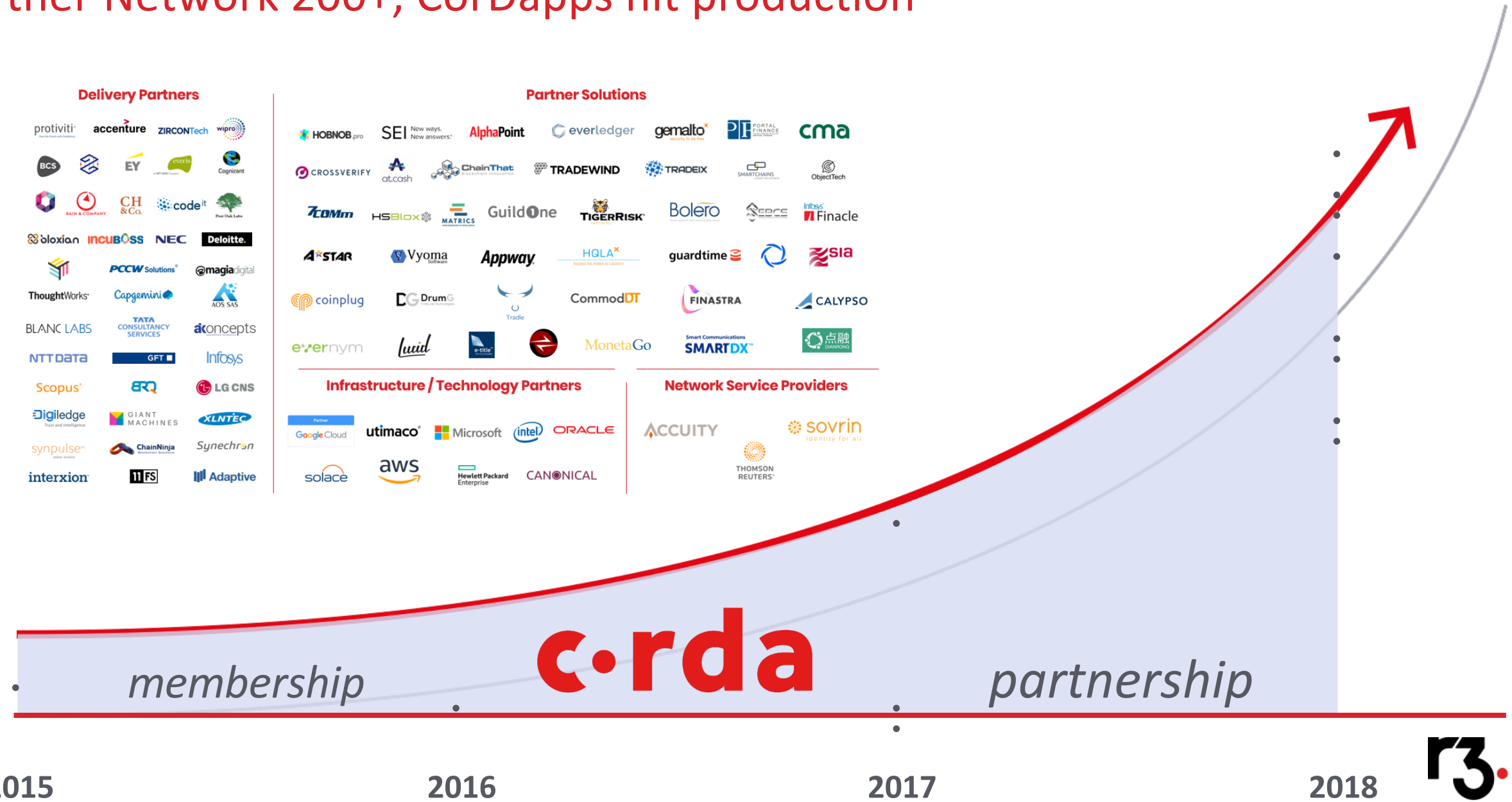
JULY 2018 | Corda Enterprise 3.0 launches with 100% interoperability with Corda 3.0 open source

AUG. 2018 | Ecosystem grows to 200+ financial institutions, regulators, trade associations, professional services firms and tech companies

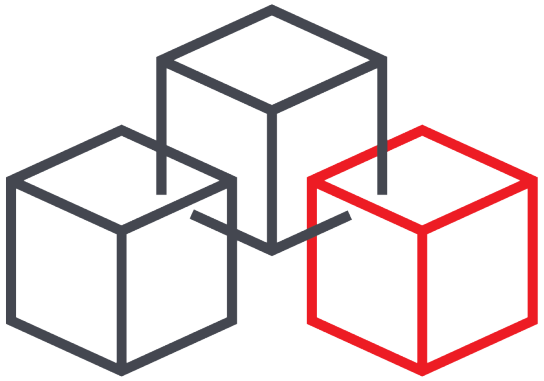
Jan. 2019 | Corda Network launches with new governing foundation, enabling interoperability

Feb. 2019 | Corda 4.0 launches

Partner Network 200+, CorDapps hit production



Discover the power of blockchain

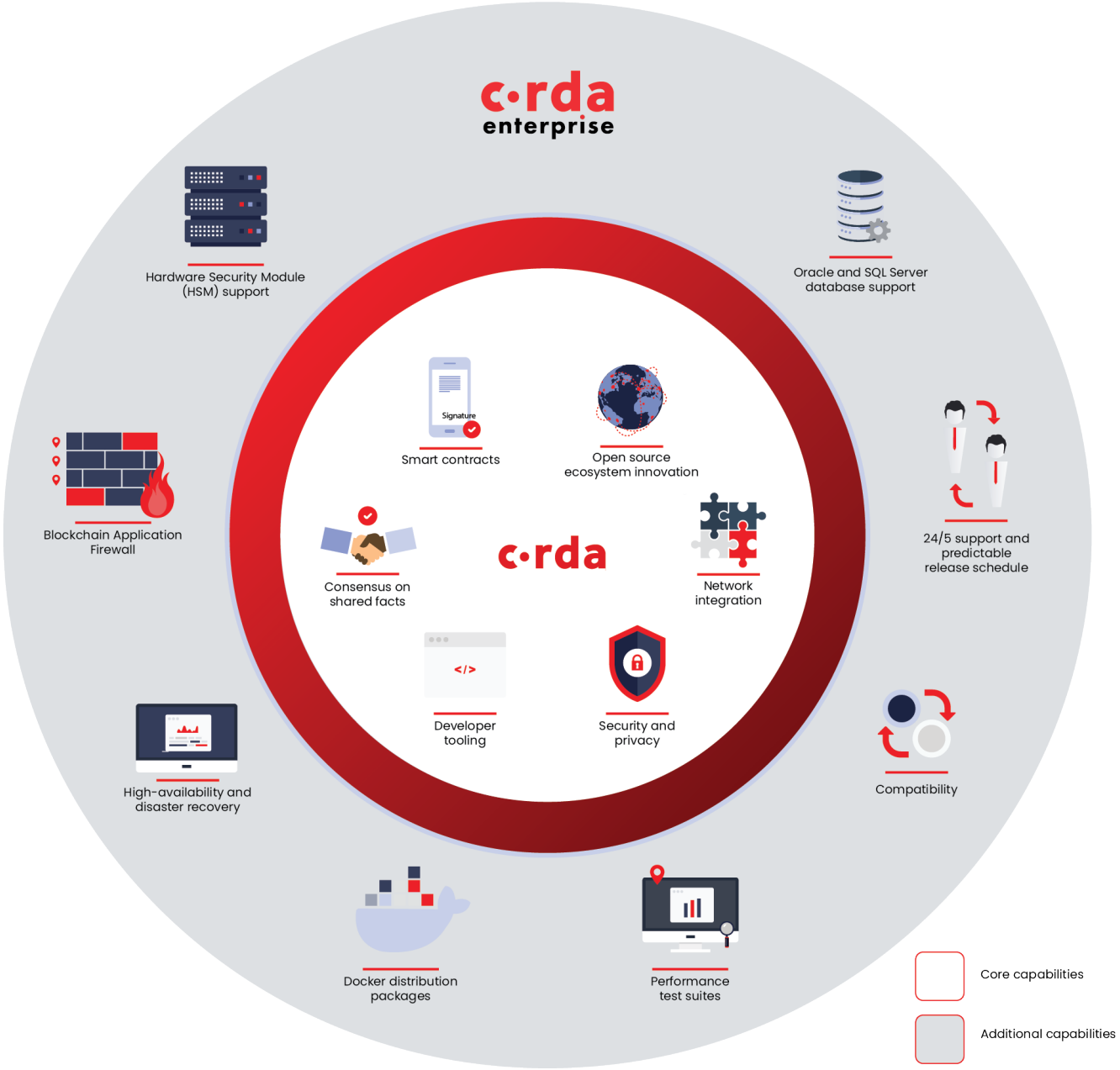


R3 rethought the blockchain concept from top to bottom to build a different kind of blockchain.

Corda removes costly friction in business transactions by enabling institutions to transact directly using smart contracts, while ensuring the highest levels of privacy and security.

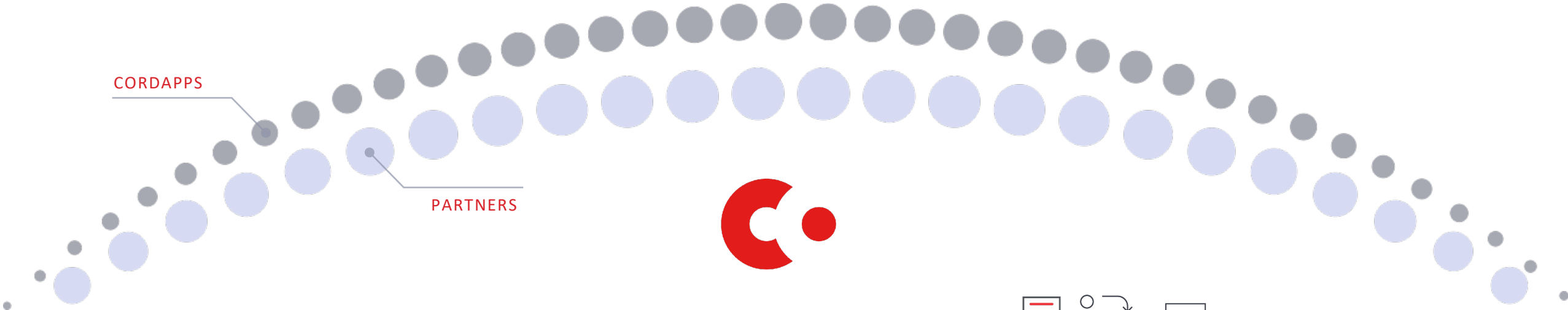
Corda adoption is through R3 Ecosystem participation. Blockchain technology is dependent on a network effect and R3 offers a thriving ecosystem of 200+ firms to drive industry-wide collaboration.

Corda and Corda Enterprise: seamless interoperability



Blockchain for every business in every industry

Select a version of Corda that fits your unique needs – regardless of industry, size, and stage of development



Open source

Freely available as open source code. Download the platform and start developing on it today.

Interoperability

Corda Enterprise

Commercial distribution of Corda software with additional mission-critical capabilities specifically optimized to meet the demands of modern-day businesses.

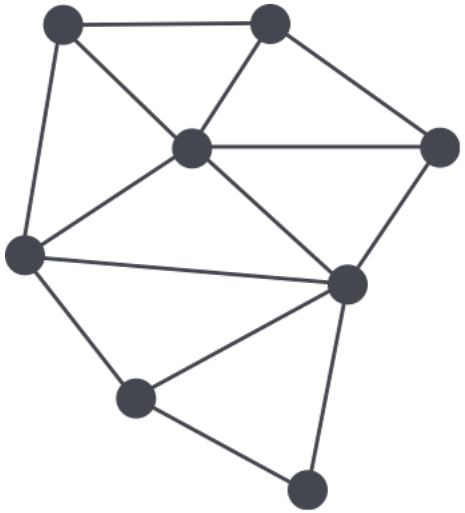
Meet Corda

The 3rd Generation Blockchain

The only blockchain platform built specifically for business

Corda is the 3rd Generation Blockchain: Open & Interoperable, With Privacy

GENERATION 1



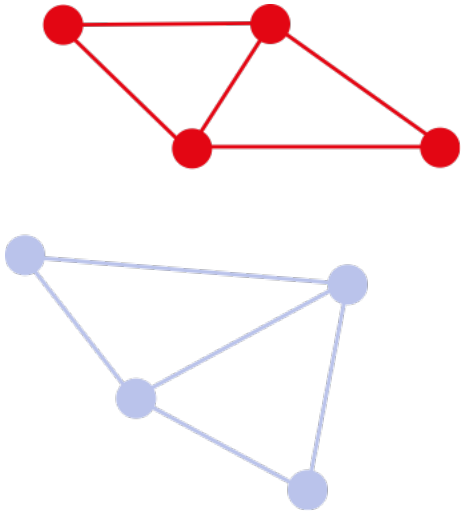
Public blockchain

- *Bitcoin / Ethereum*
- *Poor privacy*
- *Network inefficiency*

GENERATION 2

Quorum

IBM HYPERLEDGER

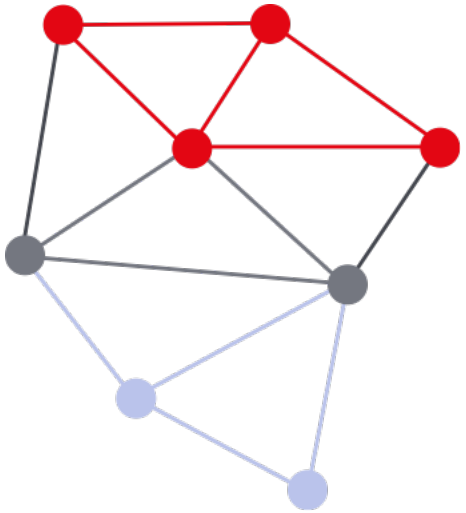


Siloed private blockchain

- *Multiple Siloed Private Networks*
- *Fabric / Quorum*
- *Stranded assets*

GENERATION 3

corda



Next-gen blockchain

- *Private but interoperable business networks with transferable assets*
- *Enables Delivery Vs Payment (DvP)*

r3

Corda: the 3rd Generation Blockchain

Blockchain for business

Corda is the world's only blockchain platform built specifically for businesses that offers privacy, scalability and interoperability

Applicable to all industries

Designed to meet the standards of one of the most complex and highly regulated industries in the world, Corda can be applied seamlessly to all other areas of commerce

Cross Industry ecosystem

Blockchain benefits are best realized when different industry participants come together to create a shared platform. R3 offers a thriving network of 200 + companies embracing this technology to solve real-world problems

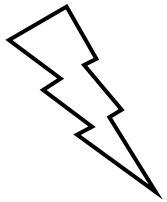
Corda is open source! github.com/corda/corda

corda

Strong Identity

Privacy

Consensus

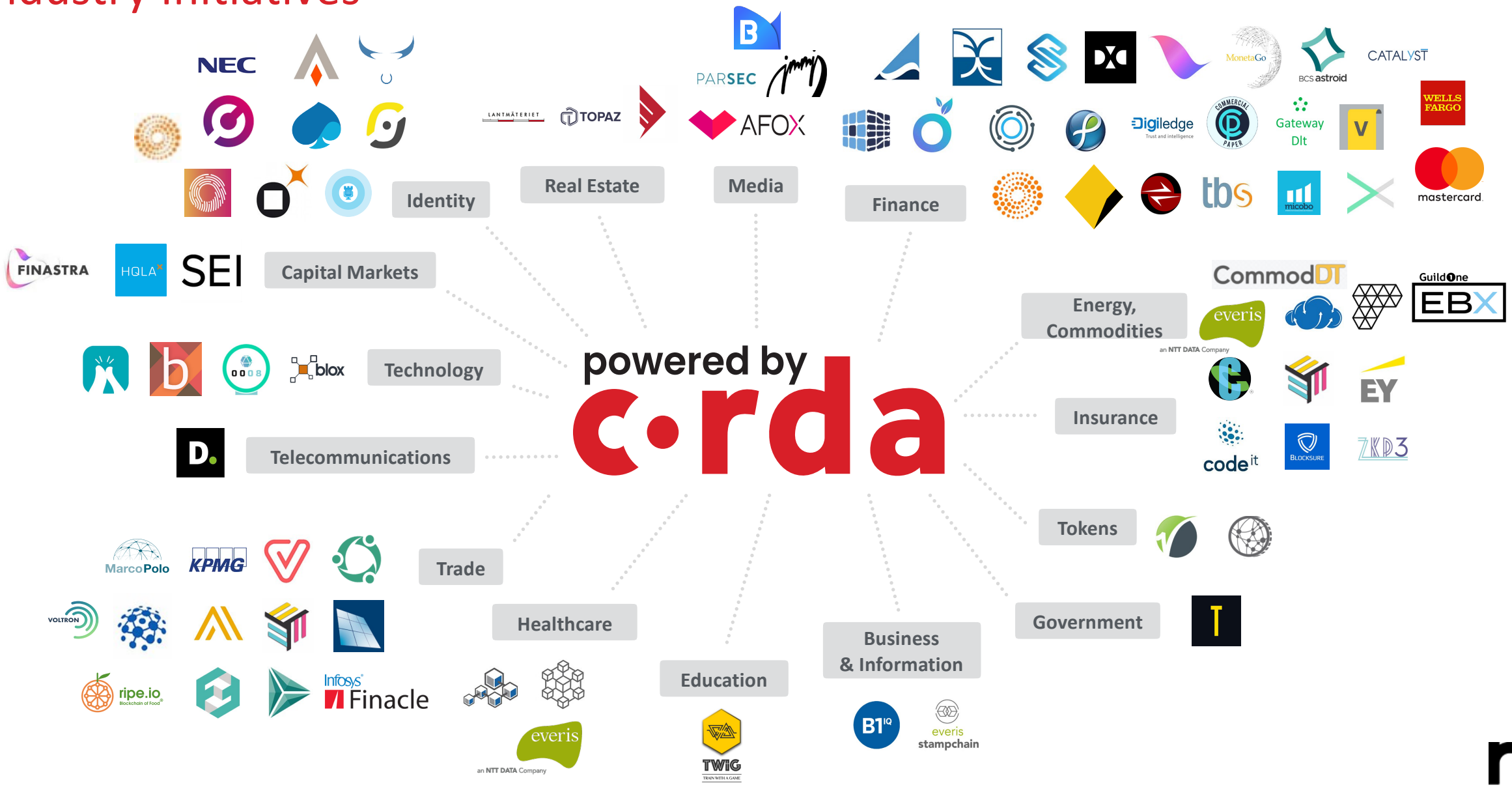


Performance & Scalability

Global Interoperability

Open Source & Network

Industry Initiatives



Illustrative example. For a full list of partners and applications visit marketplace.r3.com

Finastra – Fusion LenderComm

Fusion LenderComm digitizes communication with lenders – driving efficiencies in the process, saving agents time and money, and eliminating operational risk.

Industry problem

- Coordinating agents in the syndicated lending process is a timely and complicated procedure
- Syndicated lending is currently a paper-based process

Fusion LenderComm use case

- Fusion Lendercomm solution aims to connect lenders across the industry while digitizing the syndicated loan process

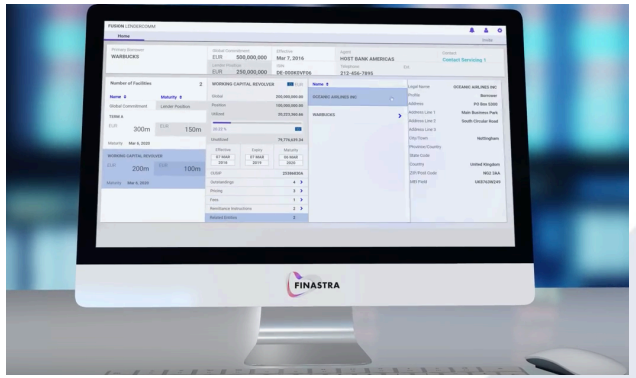
Corda Solves

- Highly secured Corda nodes maintain all digitized transaction history
- Provides every lender a personal view of their own deals
- Each message is time-stamped and provides a personalized audit trail

Benefits of LenderComm, powered by Corda

- Seamless collaboration between agent and lenders
- Fully automated, secure communication with lenders
- Real-time data
- Cloud-based technology for quick and easy adoption

Developed in collaboration with some of the world's top banks



STATE STREET
BNY MELLON
BNP PARIBAS
ING
HSBC

Tradewind Markets

First Production Example of a Digital Asset Backed by Regulated Custodian – all settled via Corda

Industry problem

- Commodities large capital investment limits market accessibility
- Banks that trade physical commodities face costs and frictions from antiquated post trade systems

Tradewind's Vaultchain use case

- Precious metals investors to execute trades with a secure, low-cost solution
- Physical gold and silver available today with platinum and palladium to follow

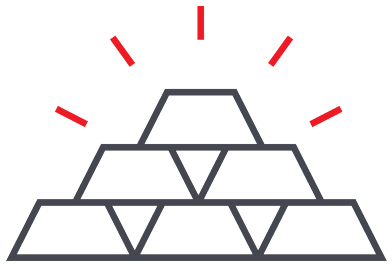
Corda Solves

- Immutable records of ownership
- Direct balance verification on Corda
- Flexible account and inventory management
- Connectivity by API and Web user interface

Benefits of Vaultchain, powered by Corda

- Increased investor pool
- Reduced post trade costs & friction
- Vaults & refiners can easily interact with customers & investors
- Increased insight into market physical demand & pricing

The ownership of precious metals is going digital



Tradewind's platform will lead the transformation, allowing physical commodities market participants to adapt quickly and easily.

Proven blockchain use cases

- Domestic CBDC
- Cross Border CBDC
- Cash on Ledger

- KYC Sharing
- Self Sovereign Identity
- Self Sovereign Connectivity

- Policy Placement
- Underwriting
- Claims Processing

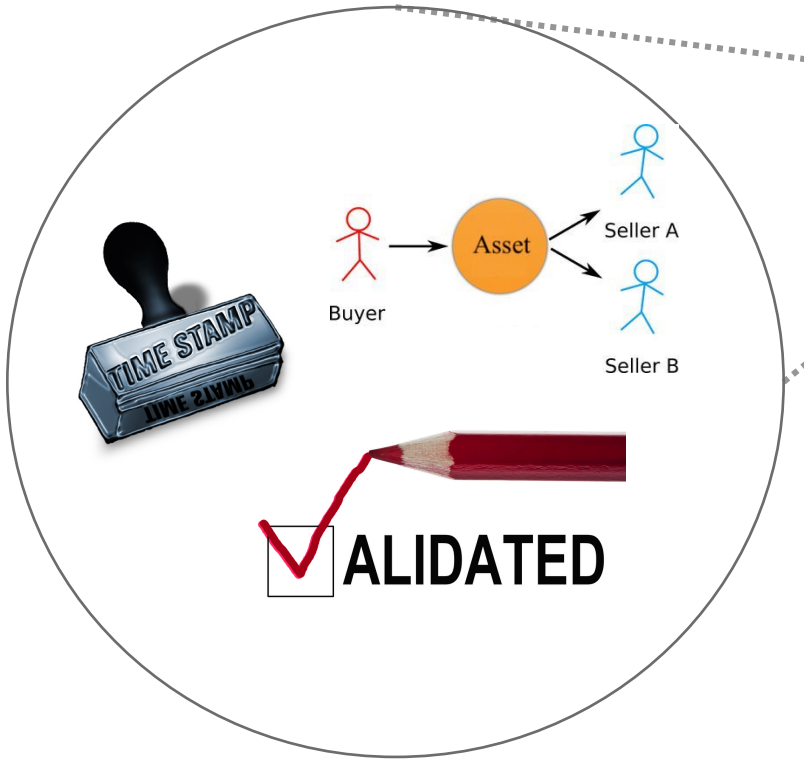
- Documentary Trade Services
- Open Account Services

- Syndicated Loans
- Securities
- Gold Royalties

At R3, we have run +100 POCs across numerous industries and sectors.

Corda Architecture

Corda is a permissioned network that provides P2P communication on a need-to-know basis



Notary

Colorado River Authority

Address: 17.149.112.236:10005

Public key: 5h54h5wv632vhy55

Titan Technology Partners

Address: 115.187.28.40:10005

Public key: 5hw03nnk43jknkj4n

Bays Transcorp Inc.

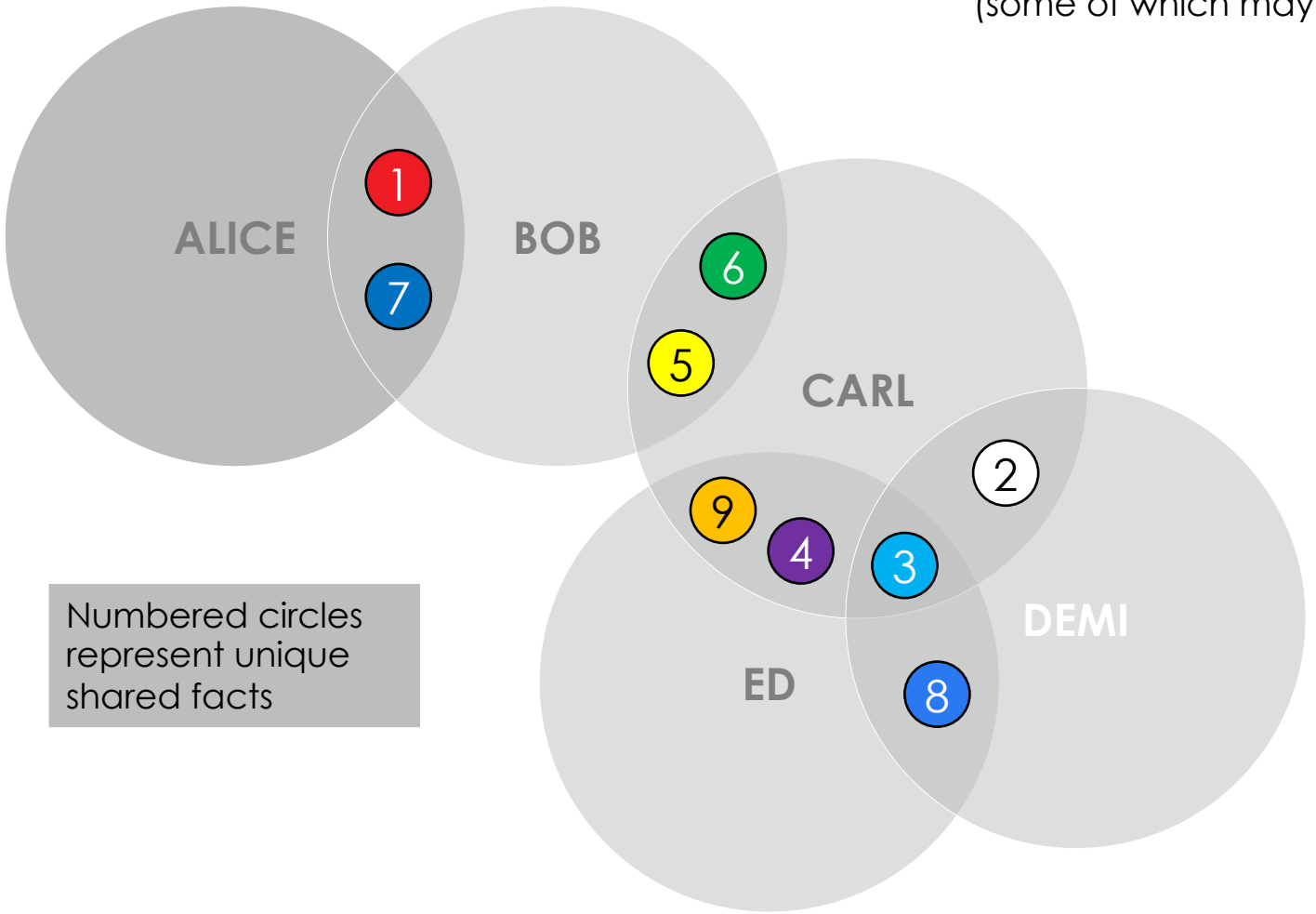
Address: 120.65.158.170:10005

Public key: t453wv84bvt3cj5w3h

The Ledger

The ledger from each peer's point of view is the union of all intersections with other network peers

(some of which may be the empty set)



ALICE = { 1 7 }

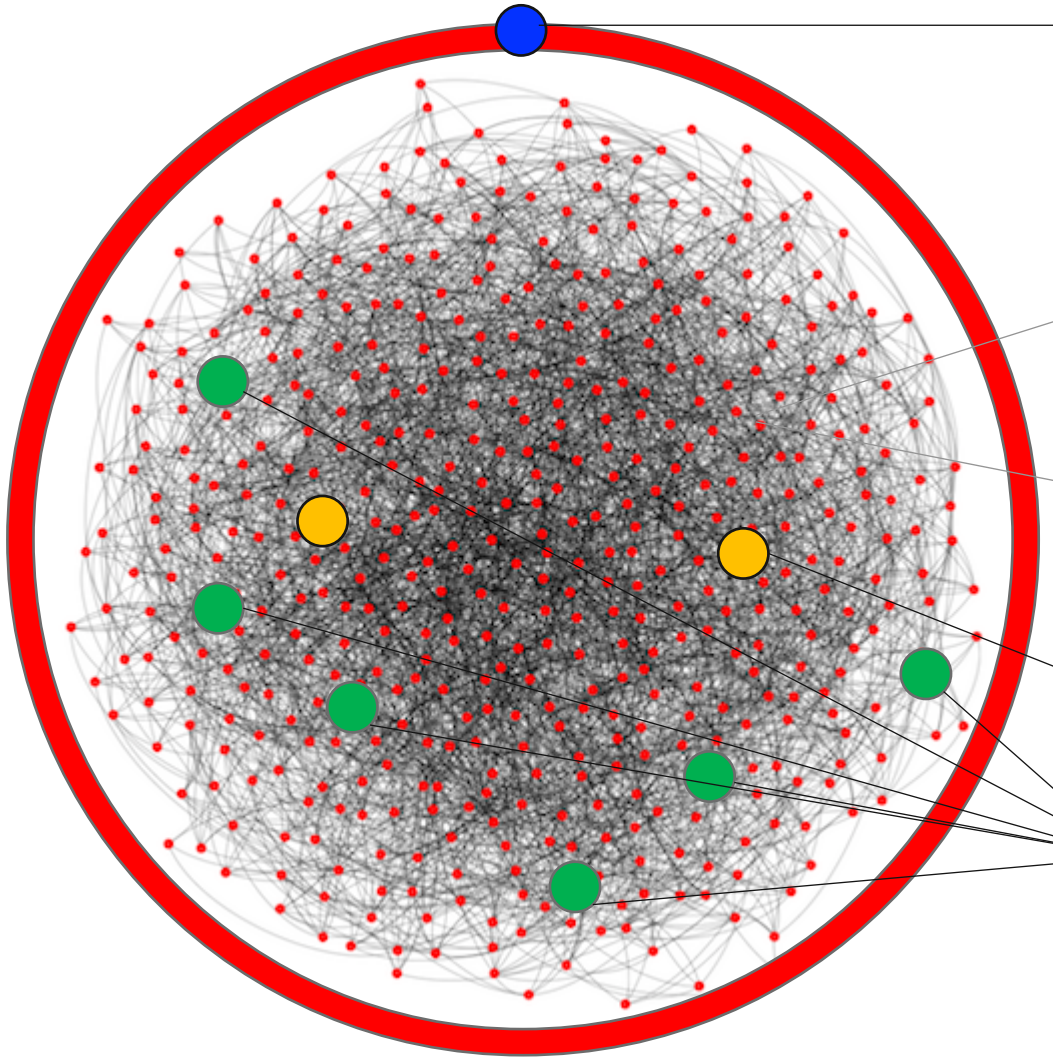
BOB = { 1 7 5 6 }

CARL = { 2 3 4 5 6 9 }

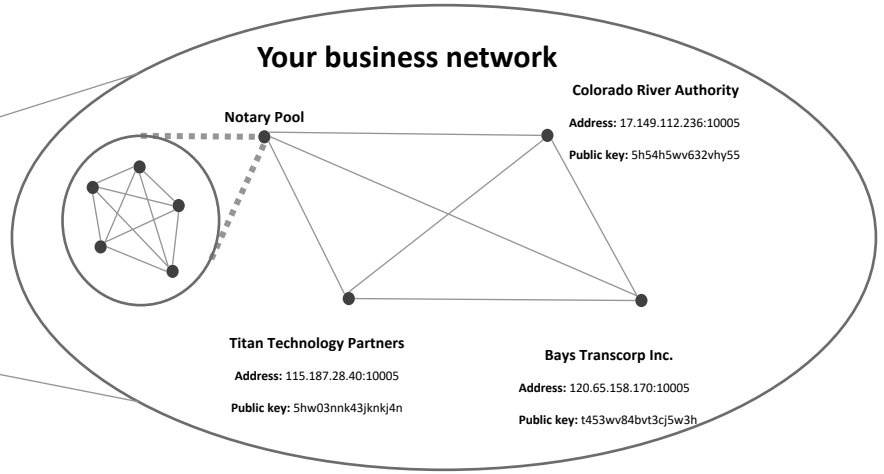
DEMI= { 2 3 8 }

ED= { 3 4 8 9 }

Corda Network



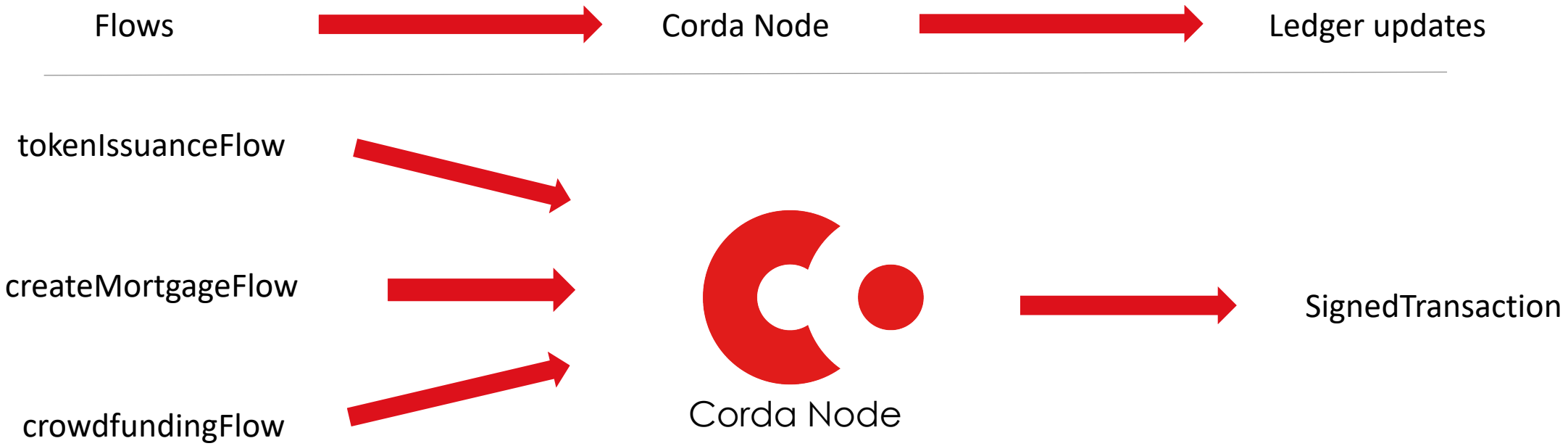
Identity manager (Doorman) & network map



Notary

Corda nodes (by other organizations)

Corda nodes abstract away the complexity of updating the ledger



The Node helps abstract away:

Messaging

Concurrency

Storage

Disaster recovery

Peer discovery

Key mgmt.

Data distribution

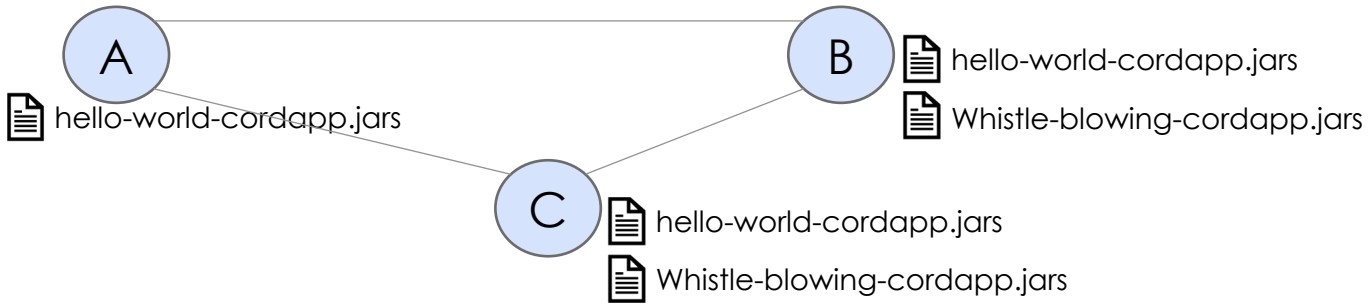
and more!

CorDapp

Corda - Decentralized - Application

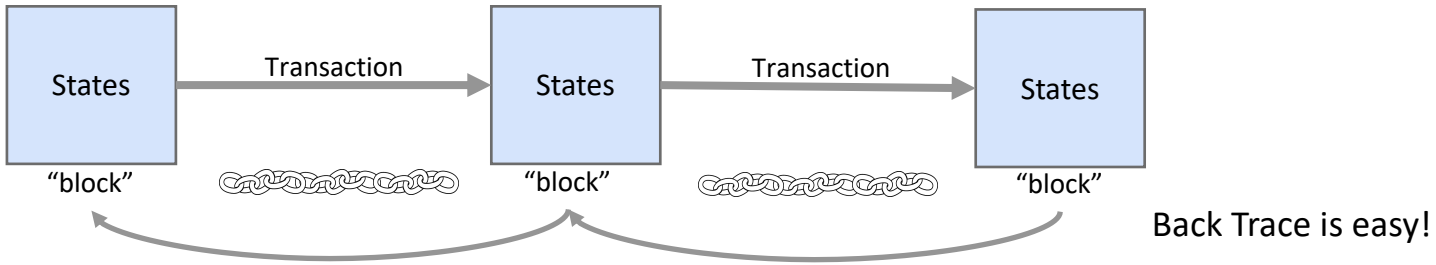
- **Decentralized Application**: computer application that runs on a distributed computing system. It is also sometimes referred as smart contracts.

- **CorDapps** are binary jars that are stored inside the Corda nodes, and each node can carry multiple CorDapps.

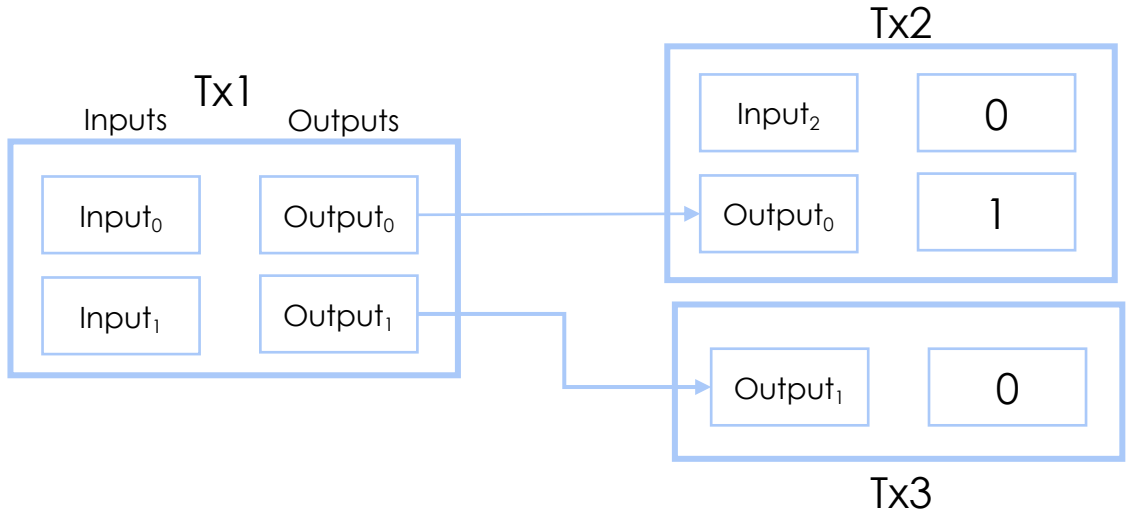


How “blocks” chain up in a CorDapp…

- Data are stored as States in Corda node’s database. And States are updated via transactions.



- Corda adopts the UTXO (Unspent Transaction output model), so data is never deleted from the database. Hence, Corda holds the immutable nature of DLT system.



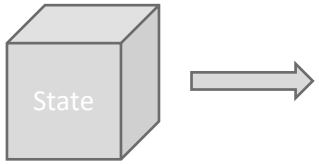
Agenda

- 9:00 - 9:15AM R3 Introduction
- 9:15 - 9:20AM VD Introduction
- 9:20 - 9:50AM Corda introduction
- 9:50 - 10:20AM Corda architecture
- 10:20 – 10:30AM **Break**
- 10:30 – 11:00AM Corda Application walkthrough
- 11:00 – 11:30AM App demo (privacy via P2P)
- 11:30 – 12:00PM Q&A

Components of a CorDapp (Smart Contracts on a Corda network)

1. State:

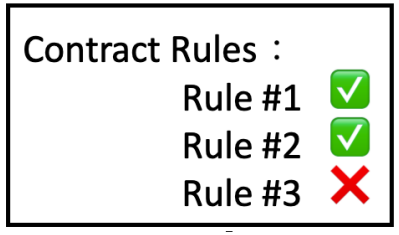
   The object in Corda



1. Get consumed
2. Get updated
3. Get stored

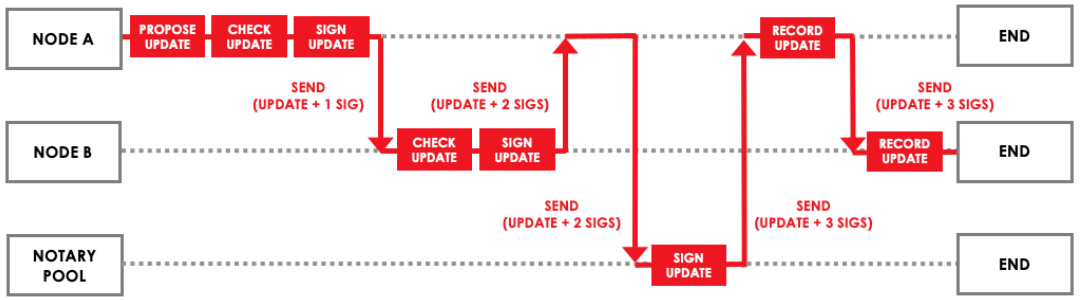
2. Contract:

   Verify the transactions



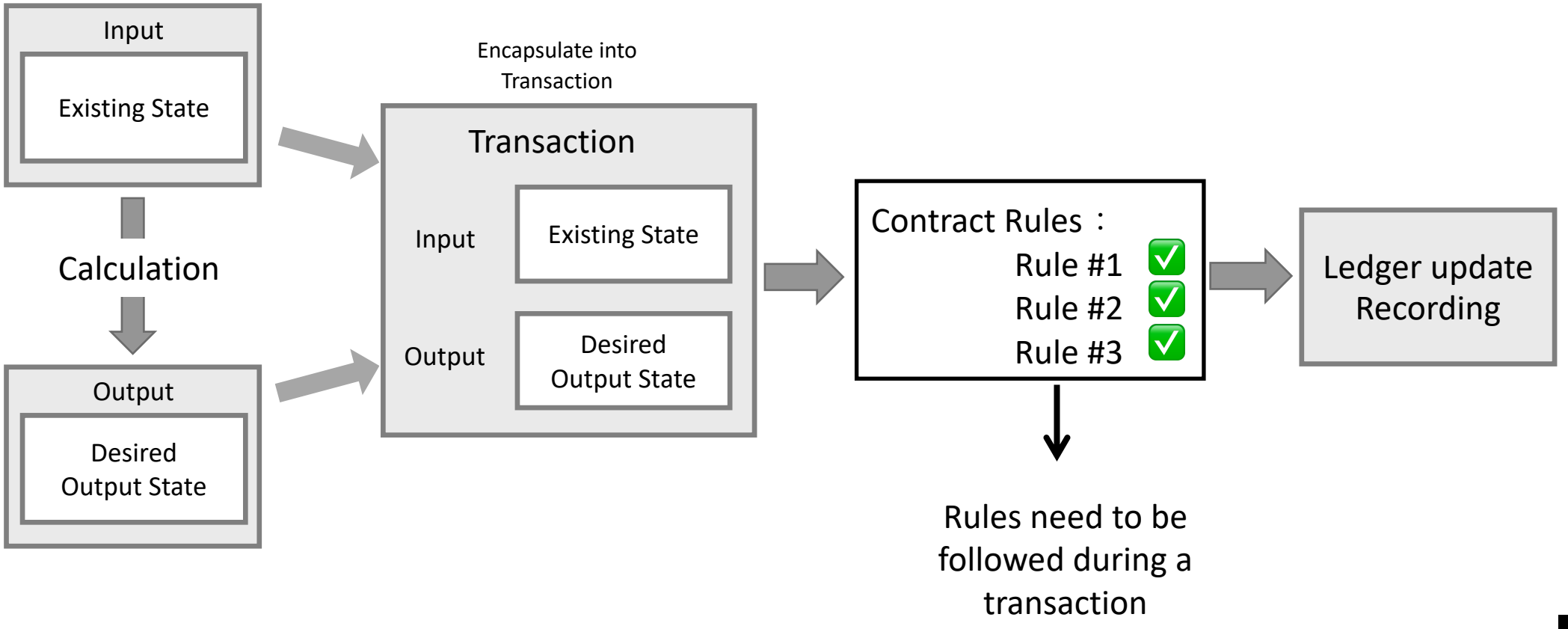
3. Flow:

   Execute the business logic



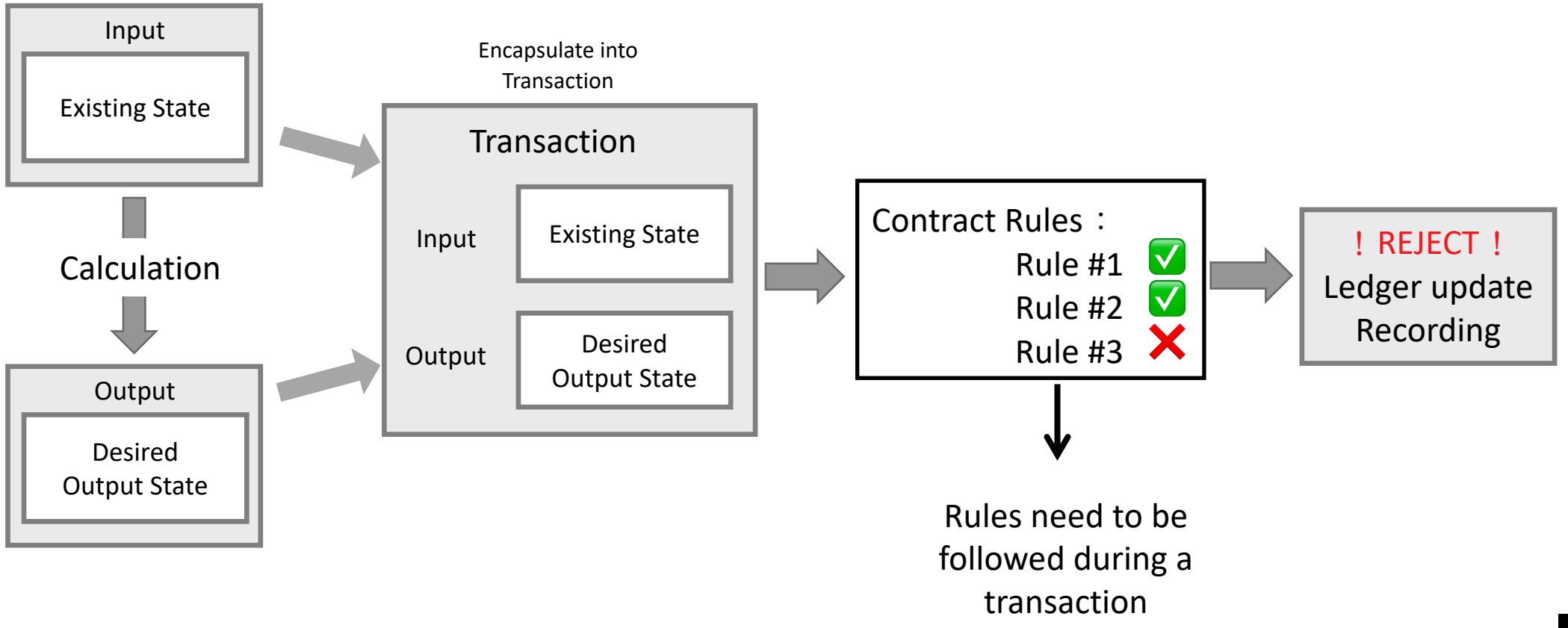
Corda Contracts in CorDapp

- Ledger update is done through transactions in the flows
- Contracts verify the validity of a transaction: SUCCESS ✅



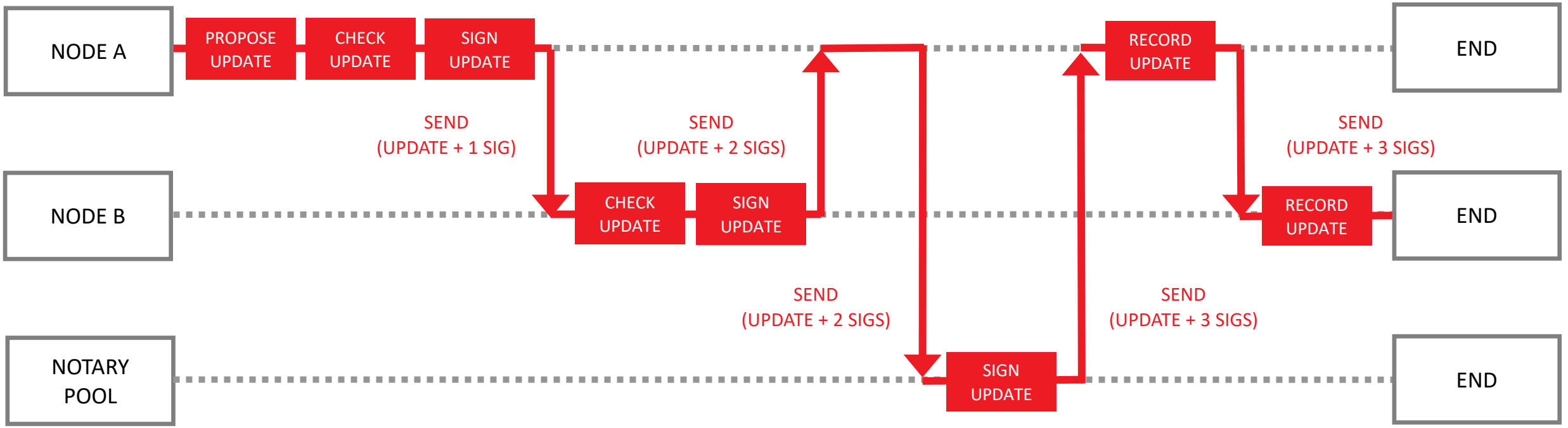
Corda Contracts in CorDapp

- Ledger update is done through transactions in the flows
- Contracts verify the validity of a transaction: FAILURE ❌



Corda Flows in CorDapp

- Flows execute the business logic
- Flows consist of two classes (Initiator & Responder)



Corda References

- Slack CordaLedger: slack.corda.net
- Corda docs: docs.corda.net
- Free Training Site: training.corda.net
- Github Repository: github.com/corda
- Email Contact: devrel@r3.com
- Twitter: @Cordablockchain @inside_r3, hashtags #Corda, #r3