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

**DEC. 2015 |** R3 consortium grows to 42 bank members

**NOV. 2016 |** Corda Open Source GA

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

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

**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

**FEB. 2019 |** Corda 4.0 launches

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

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

**GENERATION 3**
- Next-gen blockchain
  - Private but interoperable business networks with transferable assets
  - Enables Delivery Vs Payment (DvP)
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
Global Interoperability
Open Source & Network
Strong Identity
Consensus
Privacy
Performance & Scalability
Global Interoperability
Open Source & Network
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
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

Cash
- Domestic CBDC
- Cross Border CBDC
- Cash on Ledger

Identity
- KYC Sharing
- Self Sovereign Identity
- Self Sovereign Connectivity

Insurance
- Policy Placement
- Underwriting
- Claims Processing

Trade Finance
- Documentary Trade Services
- Open Account Services

Assets
- 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.
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\}

Numbered circles represent unique shared facts.
Corda Network

Identity manager (Doorman) & network map

Notary

Corda nodes (by other organizations)
Corda nodes abstract away the complexity of updating the ledger

**Flows**
- tokenIssuanceFlow
- createMortgageFlow
- crowdfundingFlow

**The Node helps abstract away:**
- Messaging
- Concurrency
- Storage
- Disaster recovery
- Peer discovery
- Key mgmt.
- Data distribution
  - and more!
• **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
   - State
     1. Get consumed
     2. Get updated
     3. Get stored

2. **Contract:**
   - Verify the transactions
   - Contract Rules:
     - Rule #1 ✅
     - Rule #2 ✅
     - Rule #3 ❌

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 ✅

Ledger update Recording

Rules need to be followed during a transaction

Contract Rules:
- Rule #1 ✅
- Rule #2 ✅
- Rule #3 ✅
Corda Contracts in CorDapp

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

Rules need to be followed during a transaction
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