What is Corda?

Corda is a distributed ledger open source platform.

It is among the most sophisticated platforms to enable the implementation of enterprise blockchain applications.

Corda was introduced by R3 (R3CEV LLC) consortium.

It is not a public blockchain.

No native cryptocurrency

Agreement Based Network.

Peer-to-peer connection.

Platform is JVM-based, written in Kotlin.

DAPPS on AWS

Corda has no unnecessary global sharing of data. – Company A acquires company B and has smart contract C1. Other companies in the network cannot access the smart contract.

All message shared are TLS-encrypted and sent over AMQP/1.0

Message senders need to know the identity of recipients.

Unspent Transaction Output (UTXO) used for recording states (just like Bitcoin).

Corda supports a variety of consensus mechanisms.

Transactions are validated by parties involved in that transaction rather than a broader pool of independent validators.

Corda records an explicit link between human-language legal prose documents and smart contract code.

Corda supports industry-standard protocols: AMQP, JDBC, etc..

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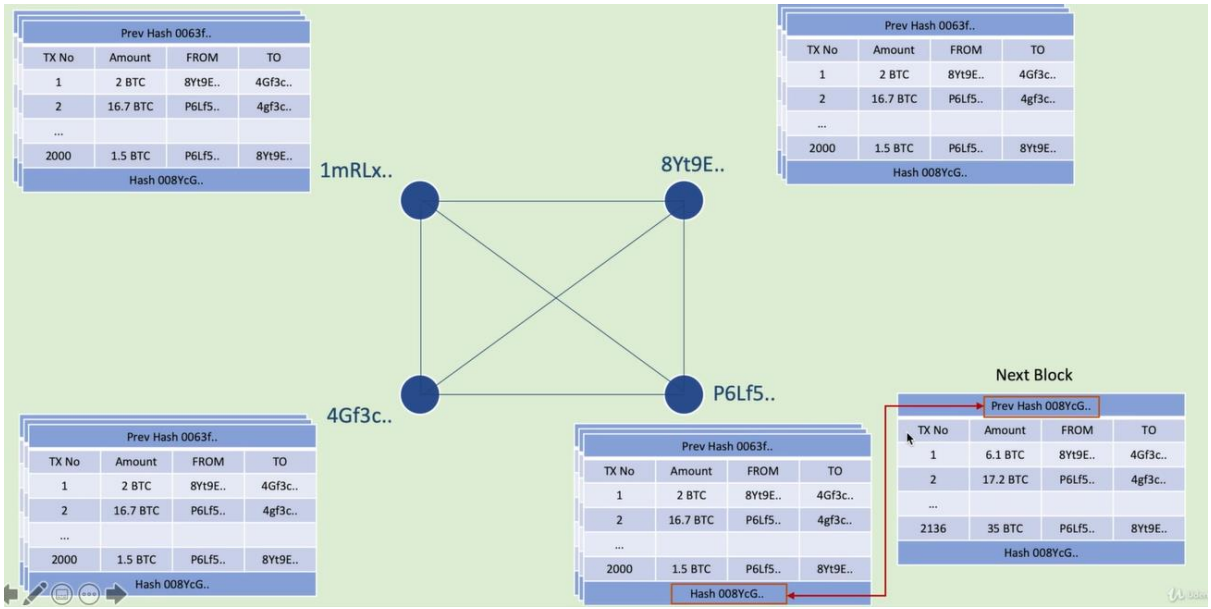
Blockchain Vs Distributed Ledger Technology

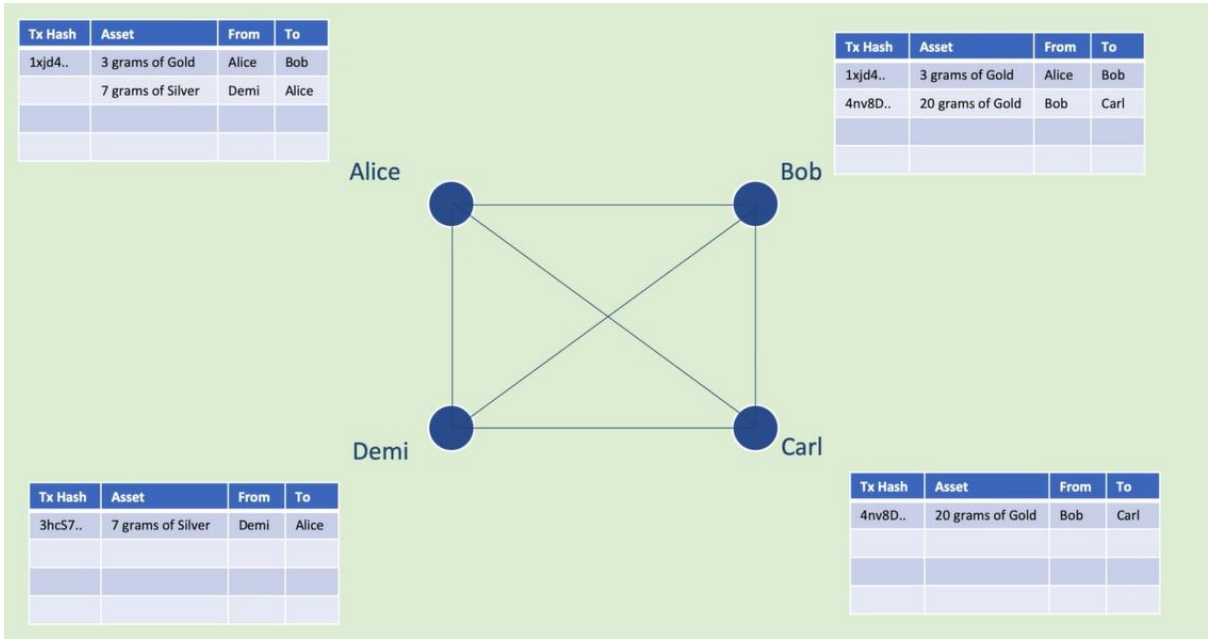
Bitcoin network:



2000 transactions per block and a block is created every 10min.

Every node has complete history of transactions of the blocks

DLT:



DLT node will have transactions for which they are only involved. No typical block.

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Introduction to corda:

No identity – only address

No privacy – transactions are shared with all node

Slow – public blockchain 5transaction per second

No integration – public and private network interoperability

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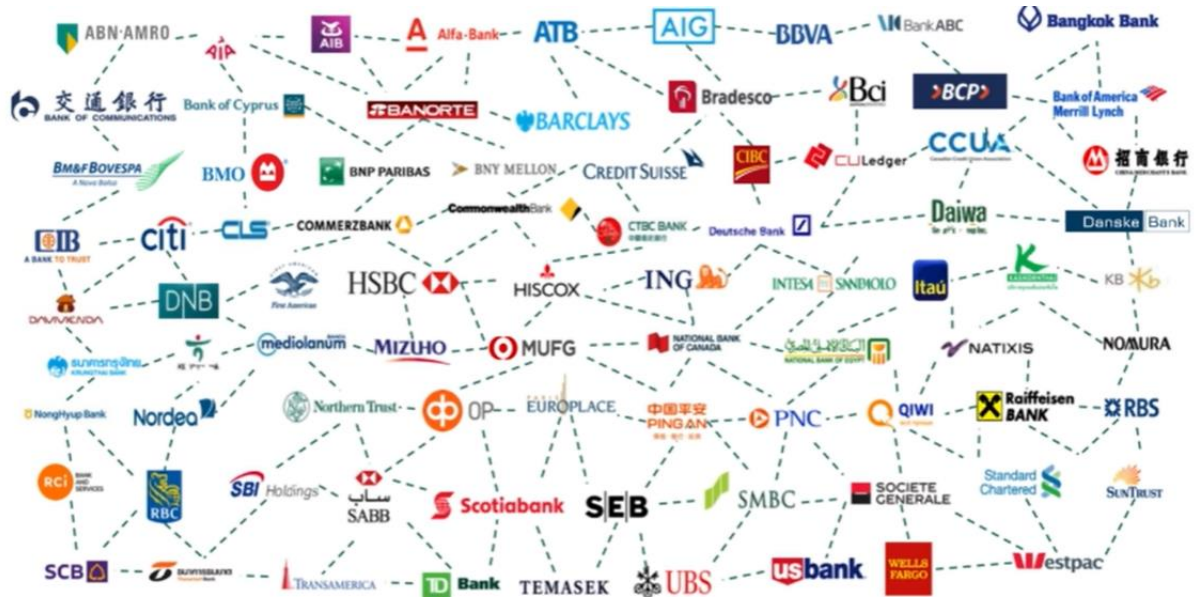
corda member network:



corda partner network:

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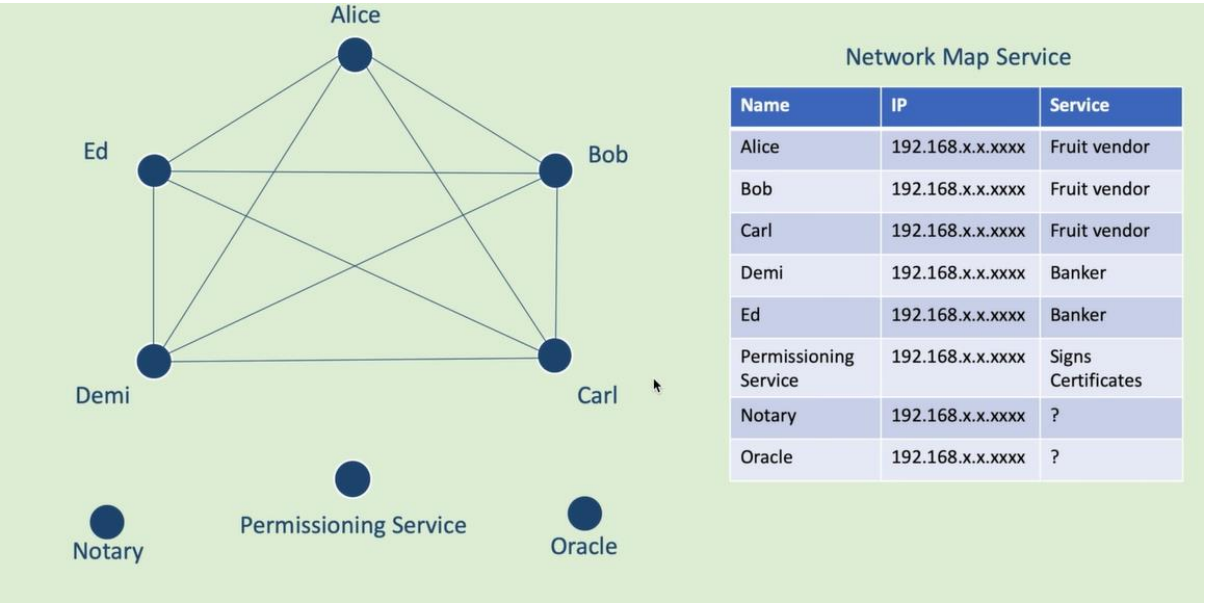
The network:



Network Map Service

Name	IP	Service
Alice	192.168.x.x.xxxx	Fruit vendor
Bob	192.168.x.x.xxxx	Fruit vendor
Carl	192.168.x.x.xxxx	Fruit vendor
Demi	192.168.x.x.xxxx	Banker
Ed	192.168.x.x.xxxx	Banker
Permissioning Service	192.168.x.x.xxxx	Signs Certificates
Notary	192.168.x.x.xxxx	?
Oracle	192.168.x.x.xxxx	?

Permissioned p2p network of nodes with access controlled by doorman

Each node runs corda software and cordapps

Each node has a well-defined identity

Network has a network map service publishes ip addresses of the nodes to reach and identity certificates of the nodes and also the service they provide.

For a node to join the network the permissioning service will provide TLS certificate

Identity-legal (who transact) or service (notary/oracle provide transaction services)

confidential identity

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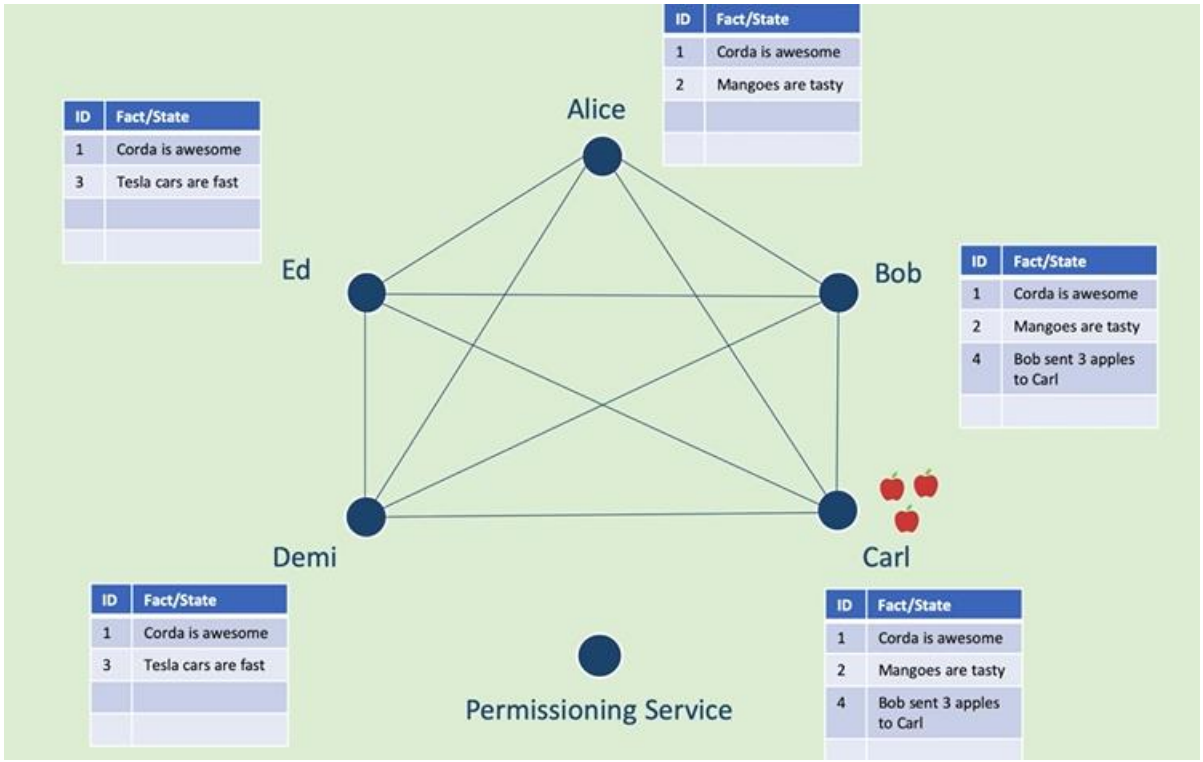
Ledger:

Transaction not globally broadcasted

Can control who can refer the transactions – share fact between specific participants



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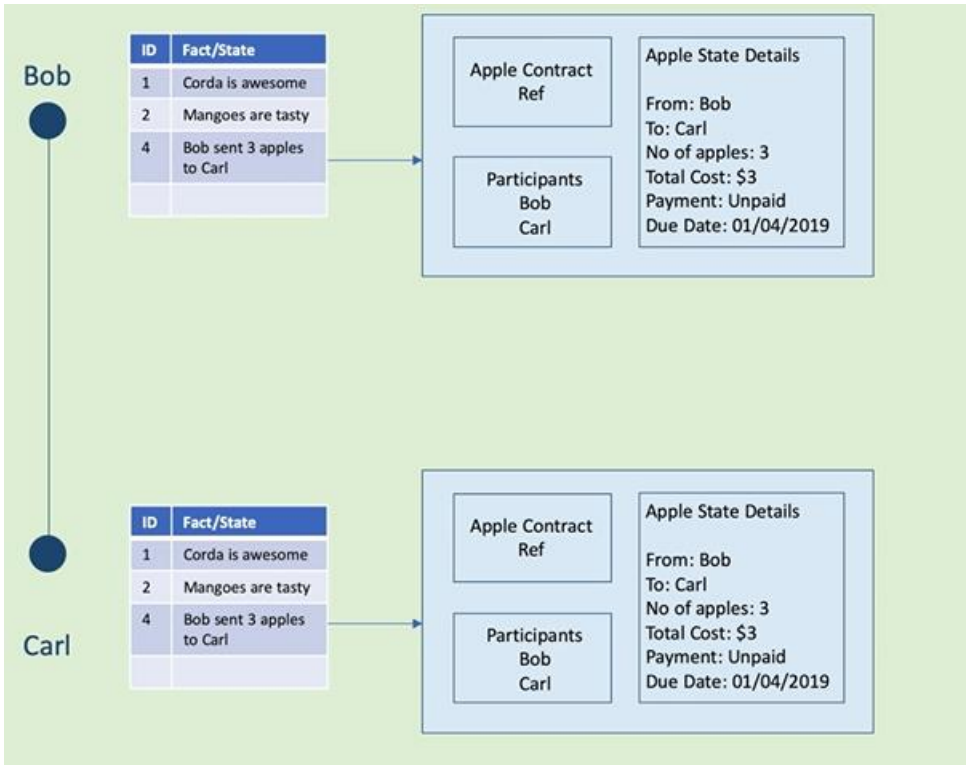
States:

State is immutable fact known to the one or more nodes in corda

Vault is a database that stores all current and historic states of the nodes

States are immutable

State can evolve as consumed and unconsumed


Bob
ID
Fact/State
1
Corda is awesome
2
Mangoes are tasty
4
Bob sent 3 apples to Carl
Apple Contract Ref
Participants
Bob
Carl
Apple State Details
From: Bob
To: Carl
No of apples: 3
Total Cost: $3
Payment: Unpaid
Due Date: 01/04/2019
Carl
ID
Fact/State
1
Corda is awesome
2
Mangoes are tasty
4
Bob sent 3 apples to Carl
Apple Contract Ref
Participants
Bob
Carl
Apple State Details
From: Bob
To: Carl
No of apples: 3
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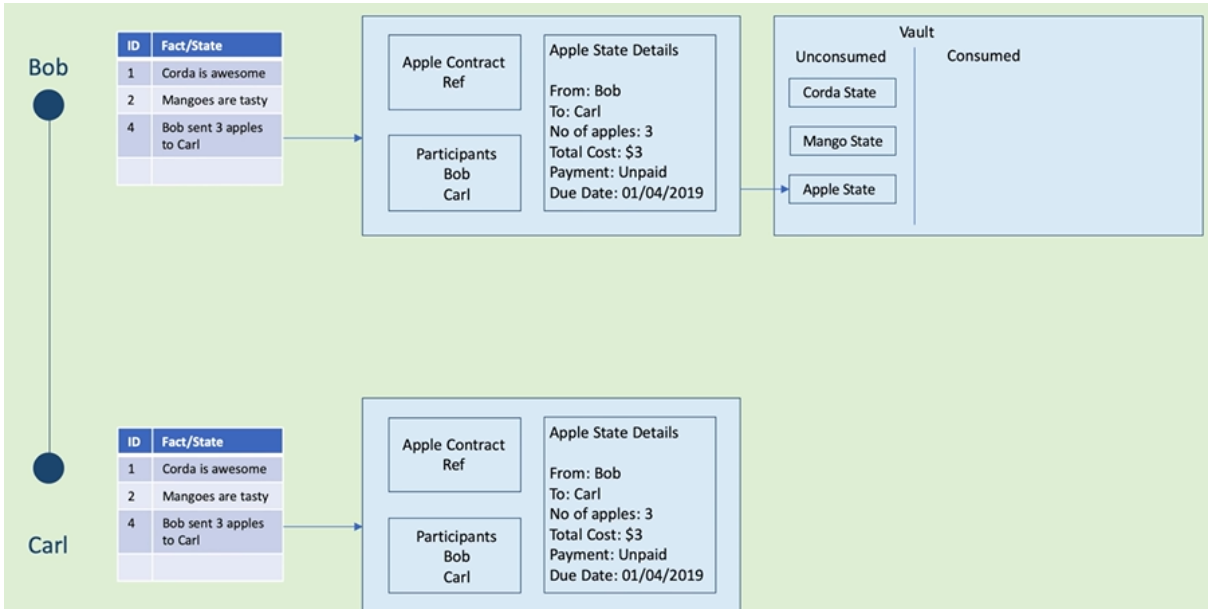
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Vault
Unconsumed
Consumed
Corda State
Mango State
Apple State
Carl
ID
Fact/State
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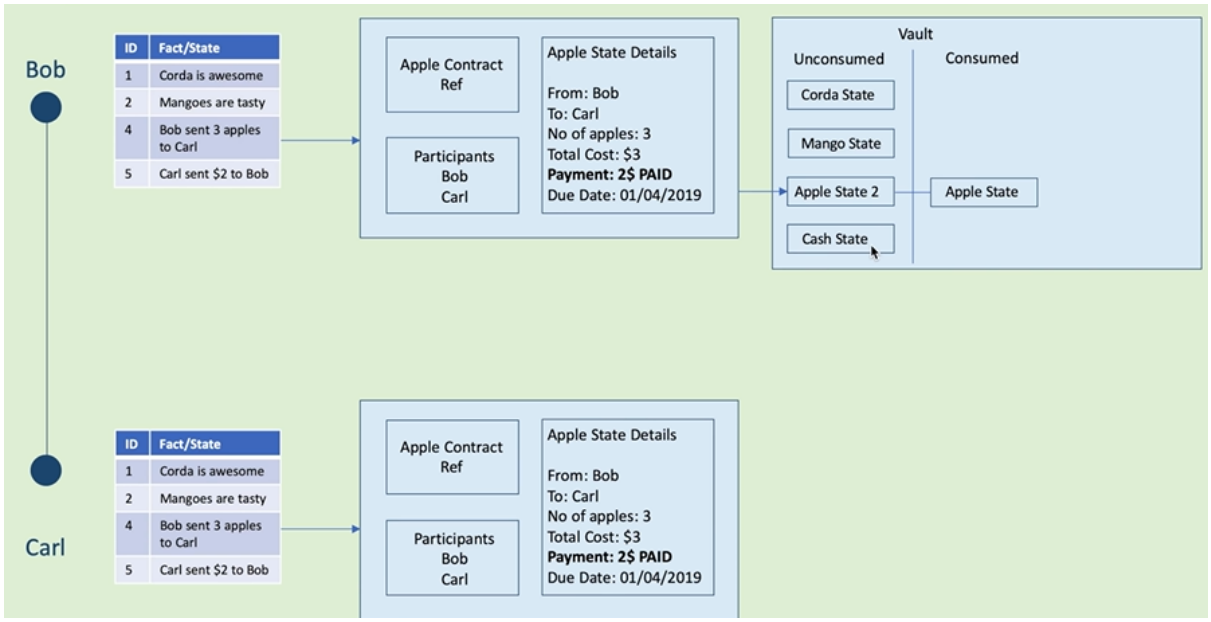

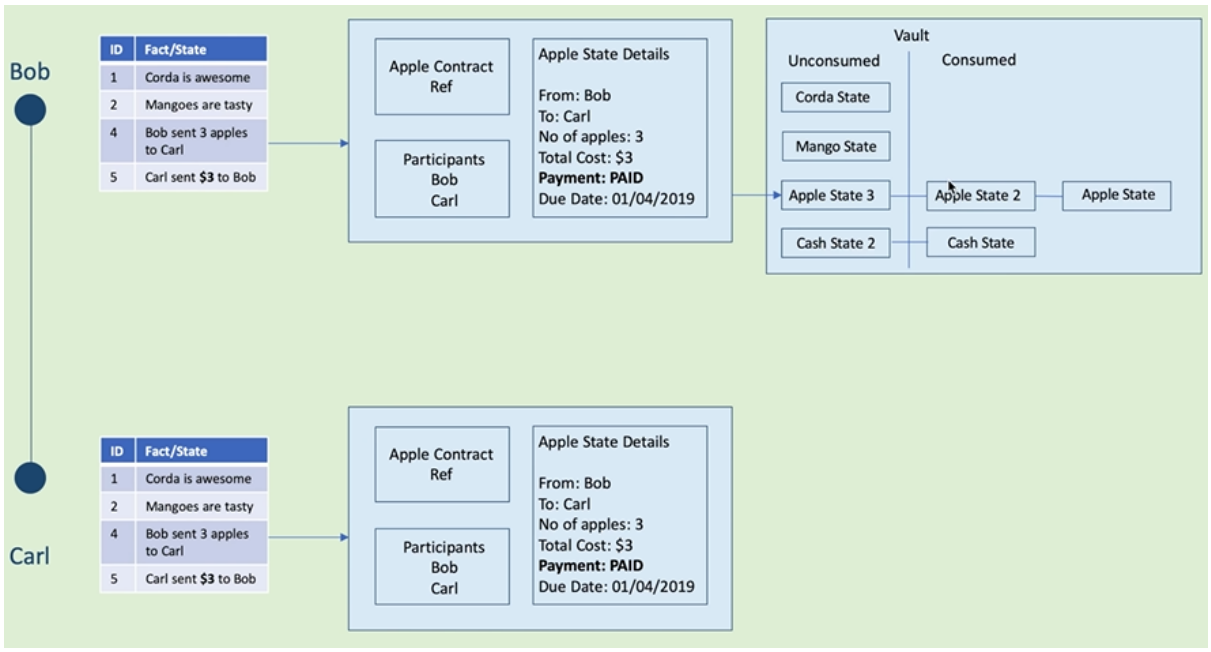

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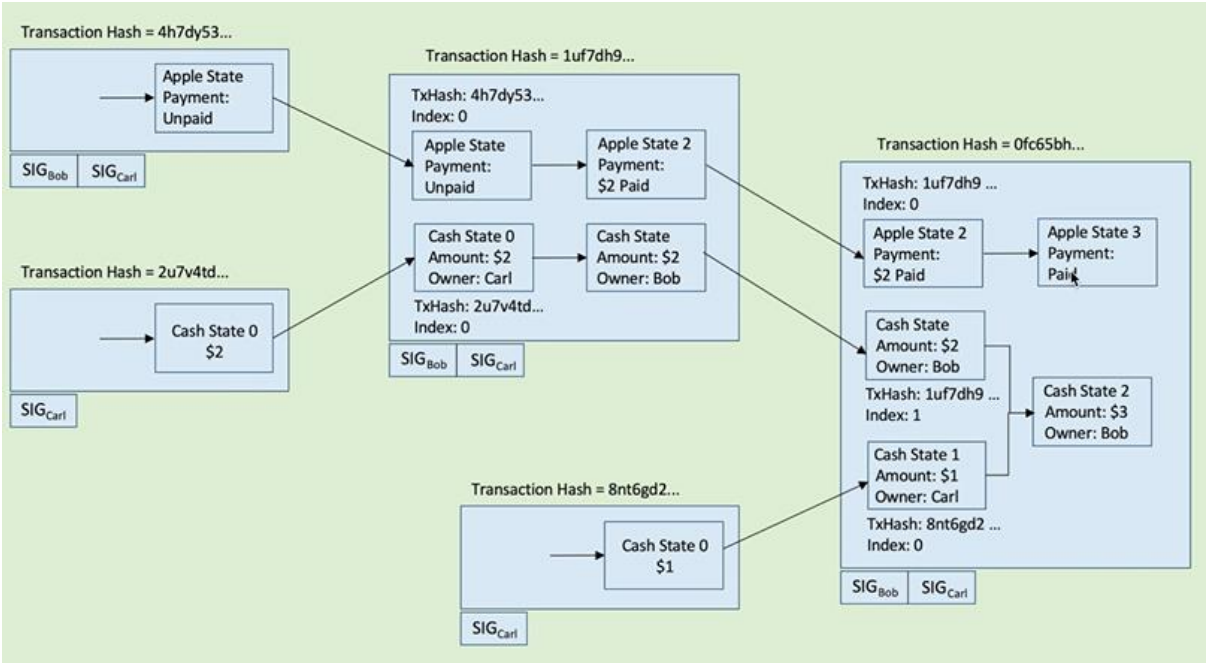
Transaction:



Issuance transaction

index

signing

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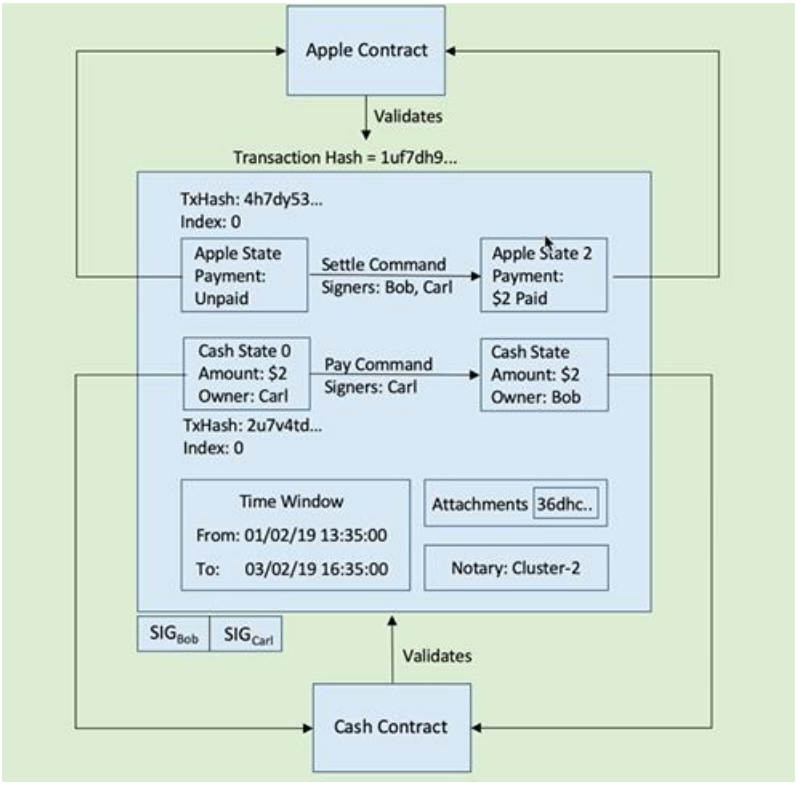
Contracts:



Only of contract is true then transaction is valid

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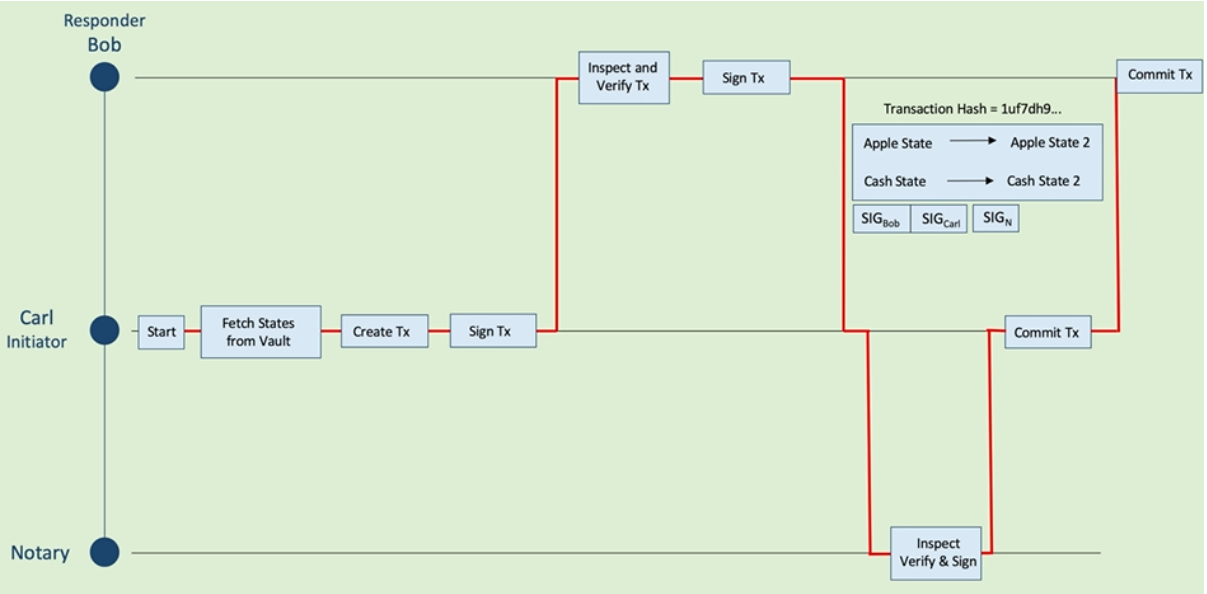
Flows:

Business logic of corda

How peers communicate



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Consensus:

validity consensus – transaction accepted by all contracts for every input and output state, all parties sign

uniqueness consensus – no input to the present transaction is consumed by another transaction

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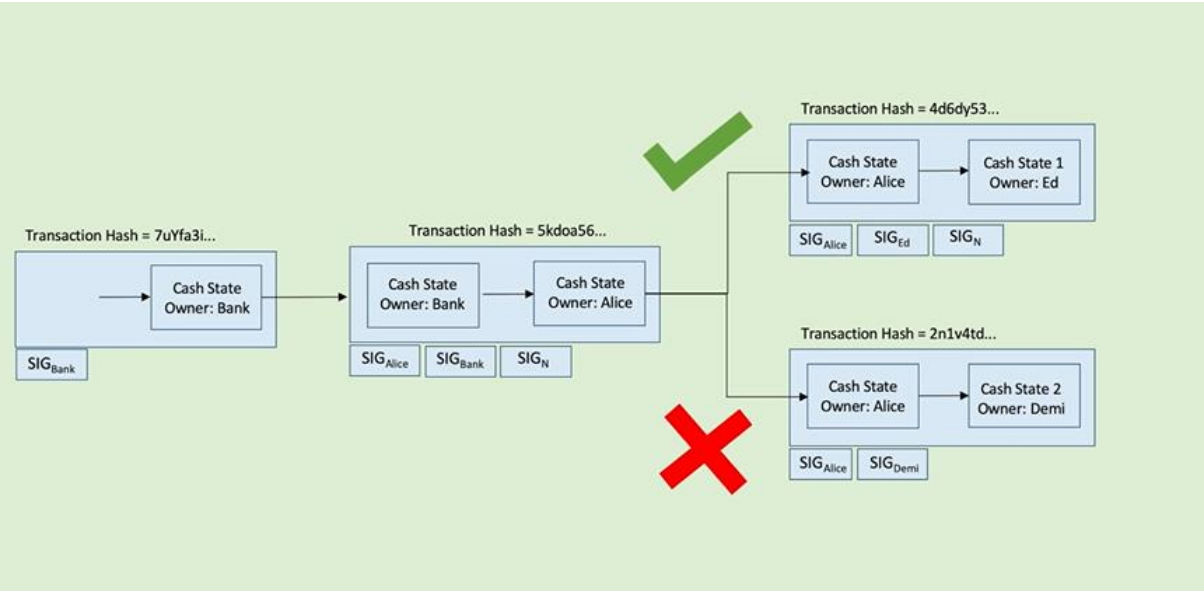
Notary:

Notary provides uniqueness consensus-prevent double spending-state change



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Oracles:

transaction happens in a time-window

interest rate in bond contract-oracle gets facts from external world

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Node:

Architecture – Java JVM running corda software, sql database

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https://www.youtube.com/watch?v=tm06GCD0XJI

1. Setting up environment:

1. Install required software
    - Java 8 JDK
    - IntelliJ IDEA
    - Git

IntelliJ idea community edition

2. r3 corda – running the cordapp template java

Mac OSX - terminal
Windows - command prompt

git clone https://github.com/corda/corda-template-java

1. Deploying the nodes

Mac OSX - ./gradlew clean deployNodes
Windows - gradlew clean deployNodes

2. Starting the Nodes

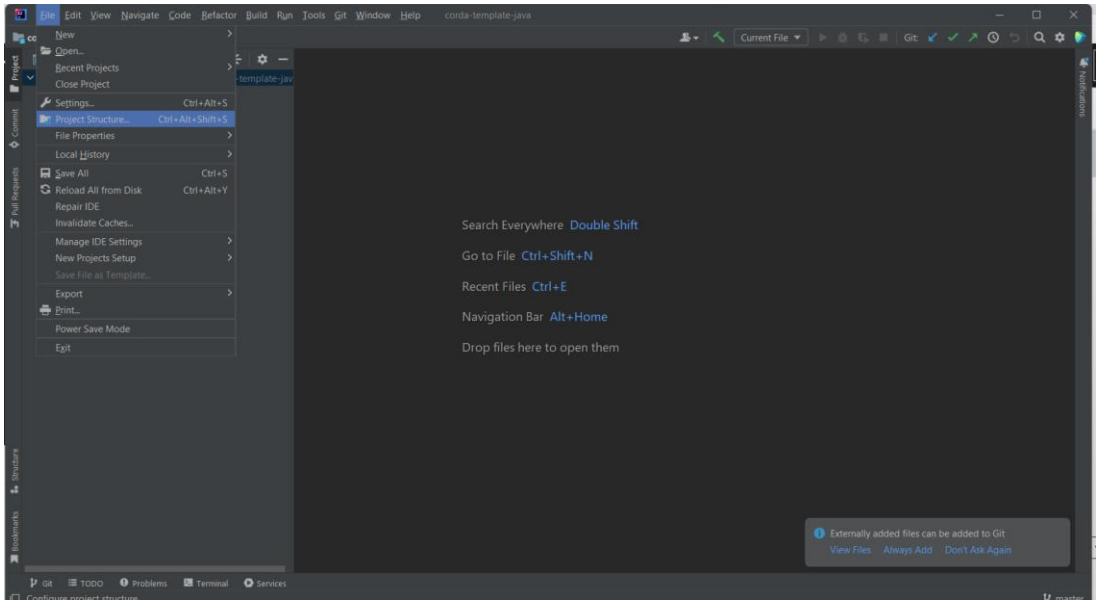
Mac OSX - runnodes
Windows - runnodes.bat

3. Running a flow

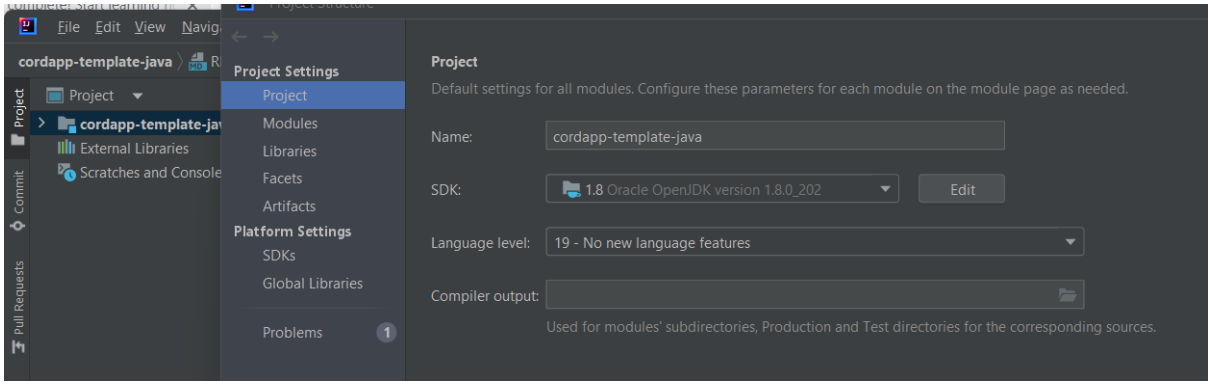
flow list
flow start

C731-85C2

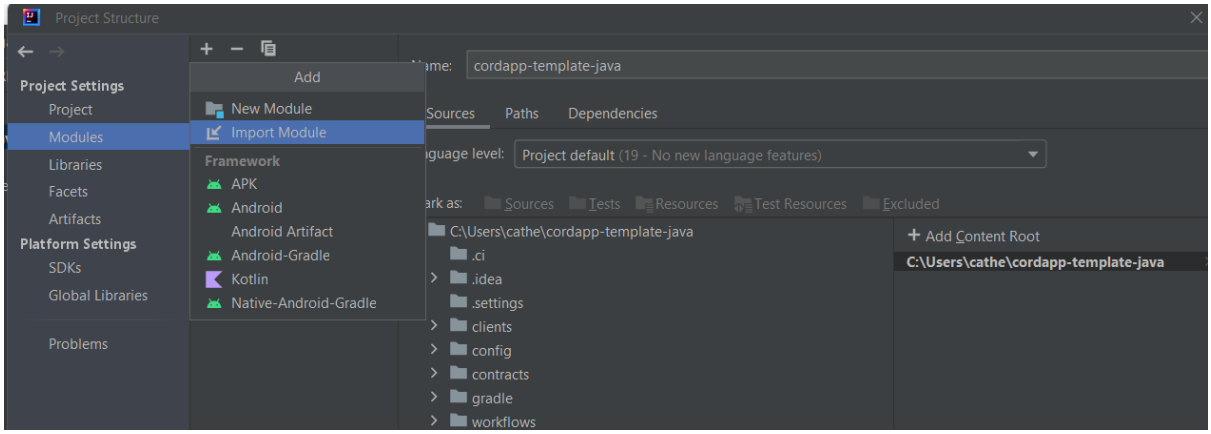
in intellij- open - cordapp template java (C:/Users/Cathe)

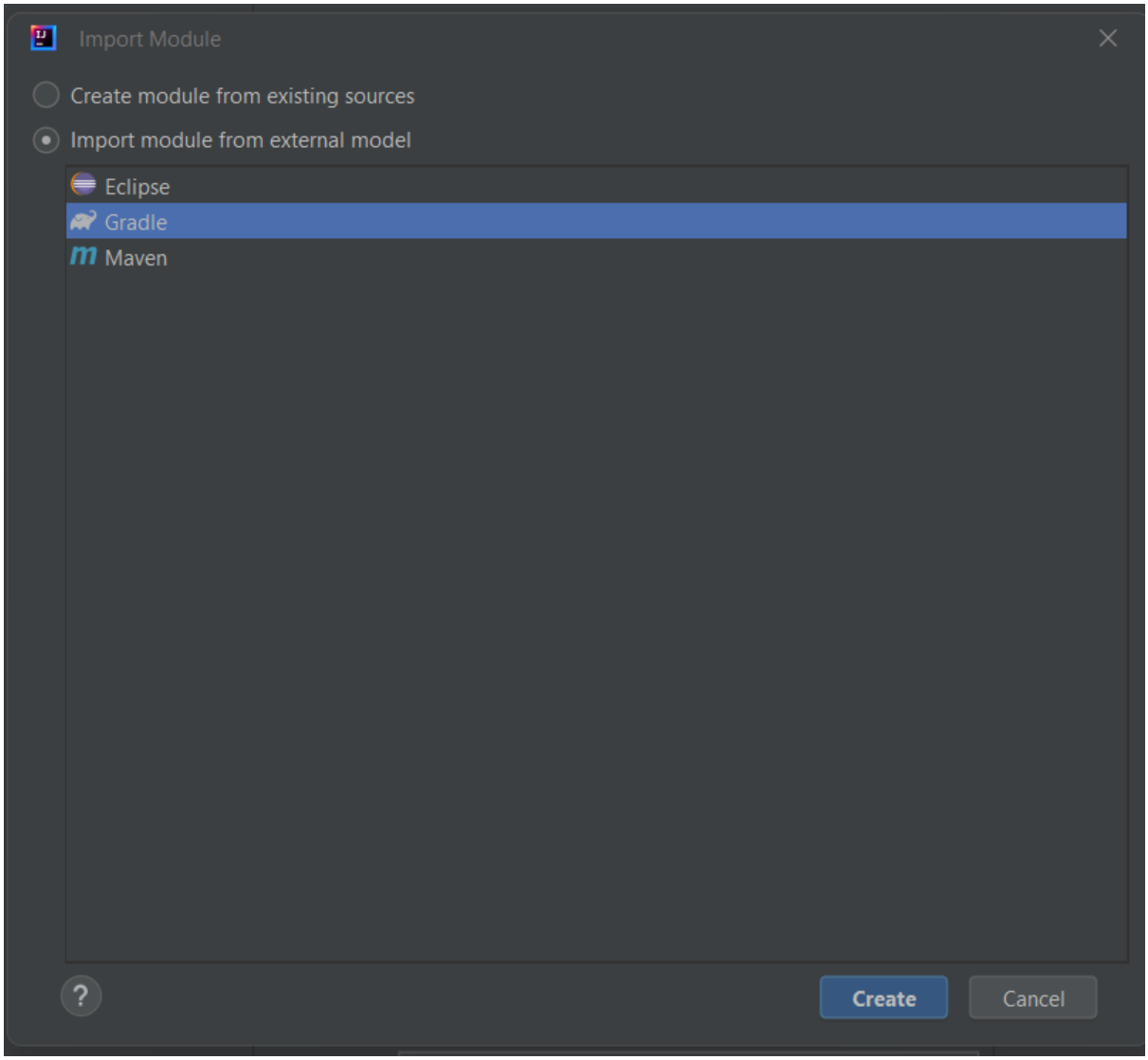


set the sdk



Module-import module

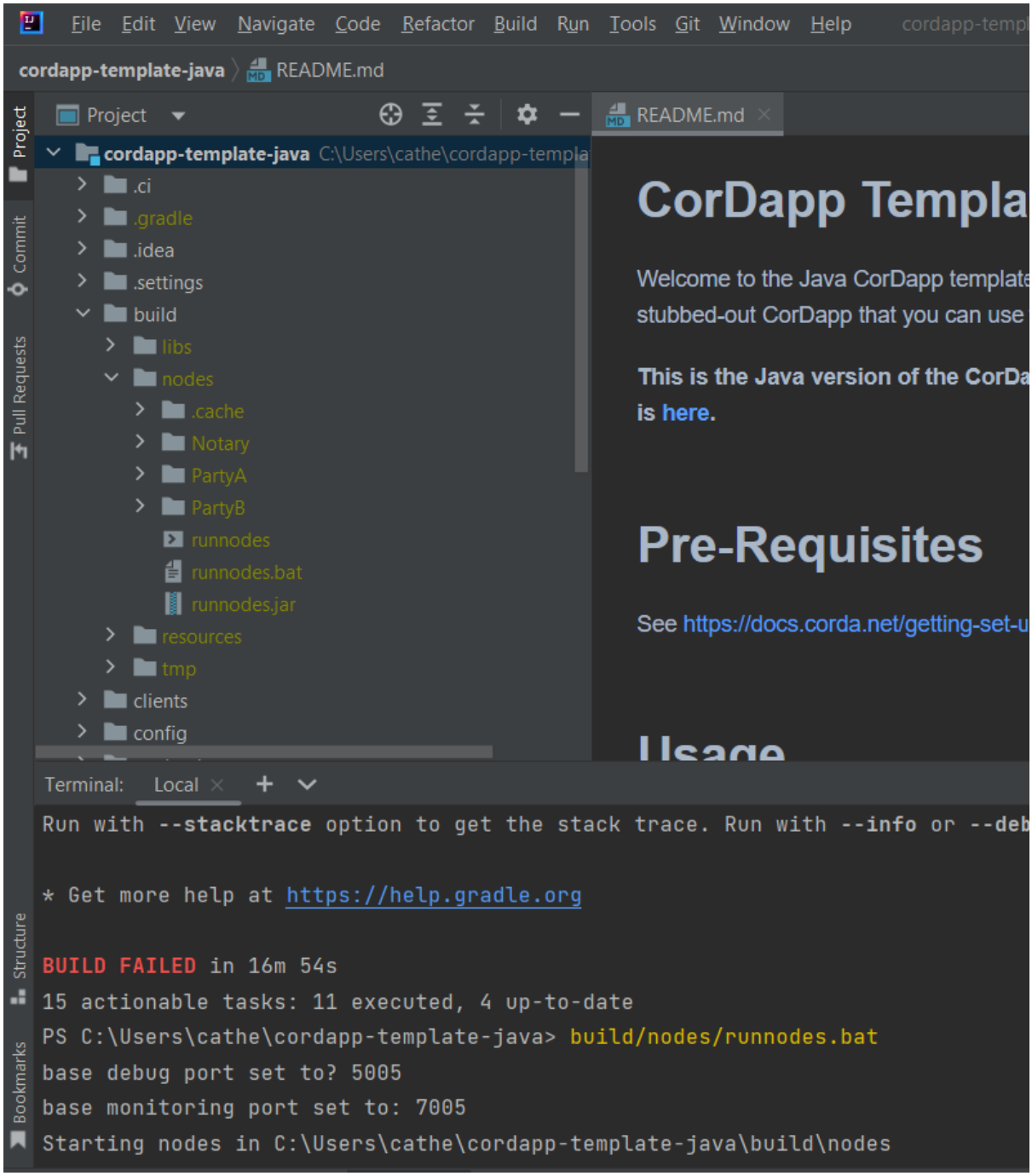




deploy nodes:

./gradlew clean deployNodes (Intellij terminal)

observe build – nodes are generated



build/nodes/runnodes.bat

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