ThoughtWorks

BCCon 全球区块链生态技术大会
Global Blockchain Eco-Technology Conference

区块链在汽车金融中的应用

鄢倩

ThoughtWorks 高级咨询师

主办方 Geekbang 极客邦科技 InfoQ

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分布式数据库

可追溯

不可篡改

数字货币

区块链

去中心化

点对点网络

透明

信任机器

小结：区块链的特征

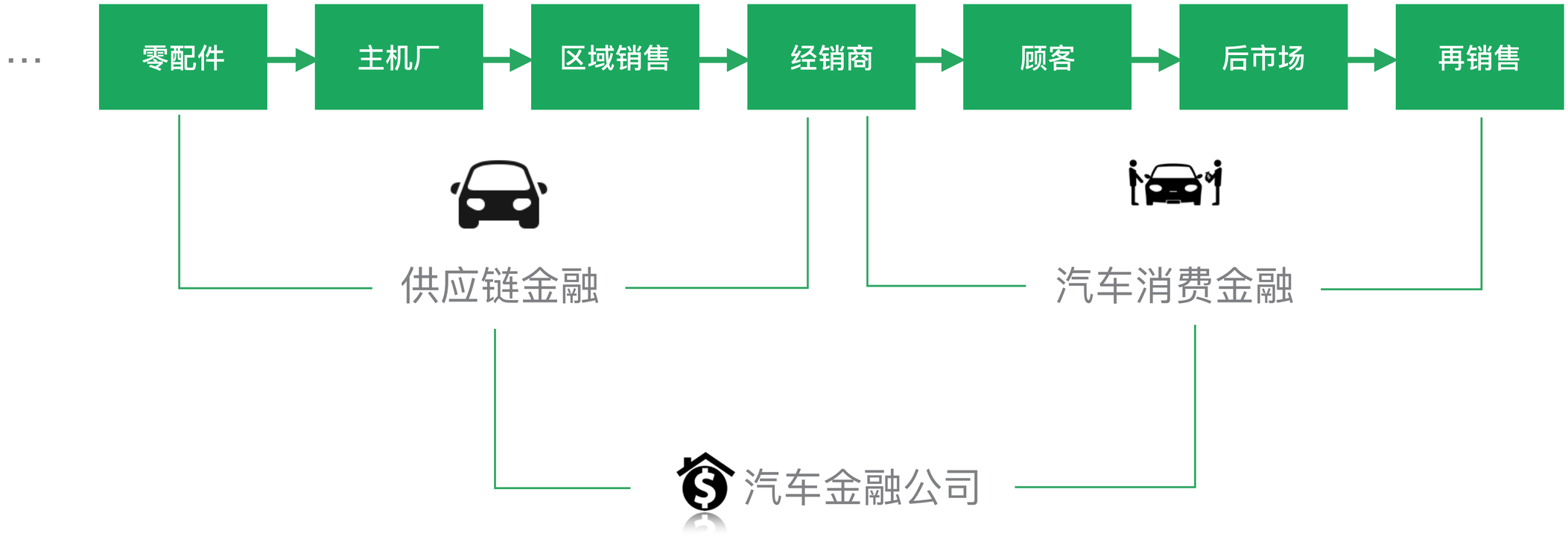
- 分布式账本

- 可追溯

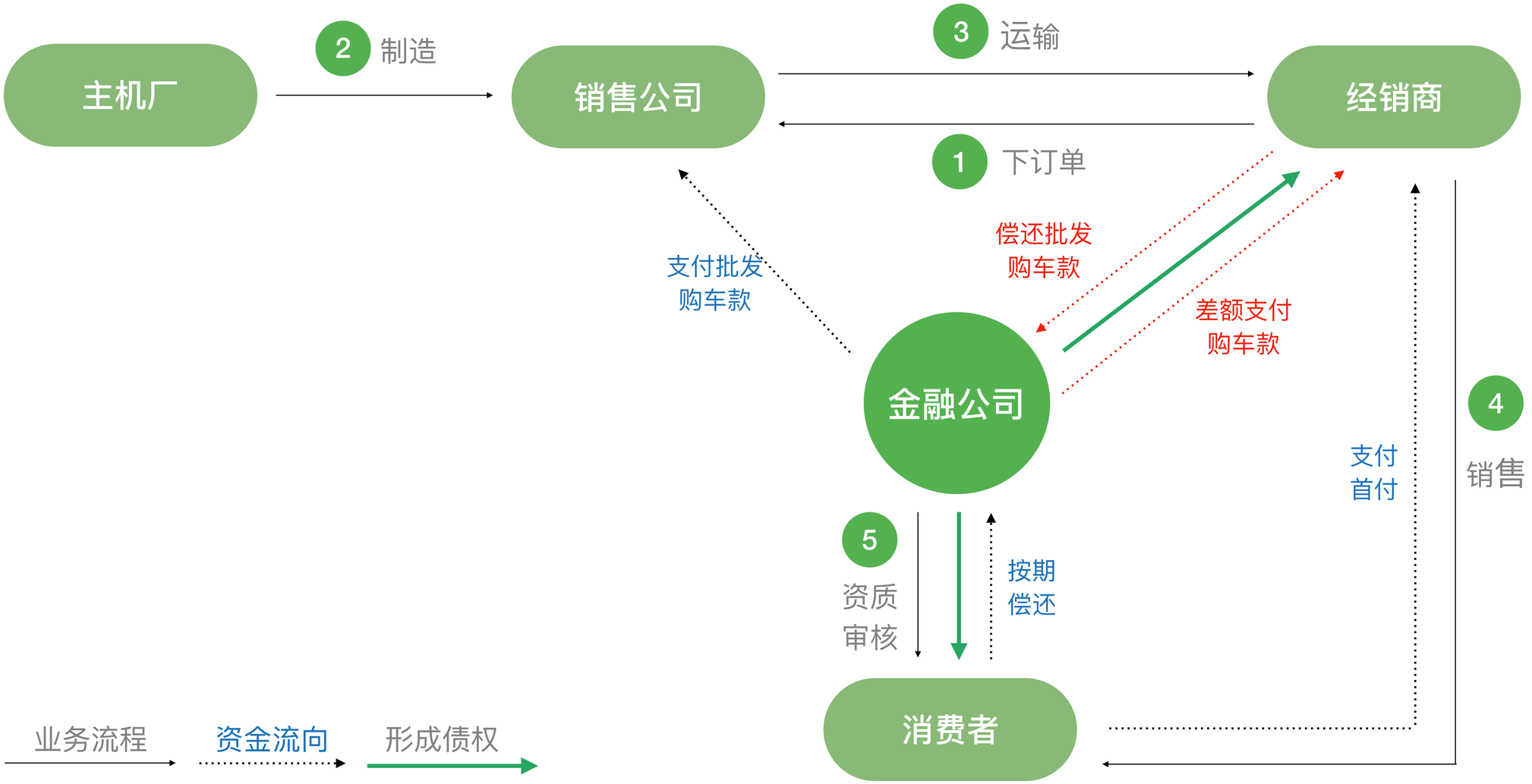
- 智能合约：信任的机器

汽车金融行业背景

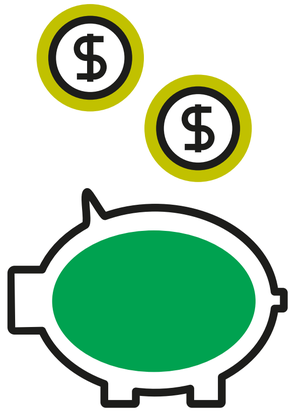
汽车的生命周期



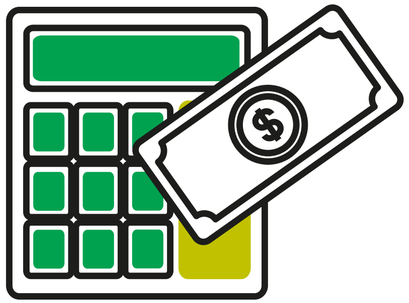
汽车金融公司业务模式


主机厂
2 制造
销售公司
3 运输
经销商
1 下订单
支付批发
购车款
偿还批发
购车款
差额支付
购车款
金融公司
4
销售
支付
首付
5
资质
审核
按期
偿还
消费者
业务流程
资金流向
形成债权

业务痛点



- 财务成本高昂且效率不高



- 资金利用率不透明

- 信任主体数量较多，审核门槛高

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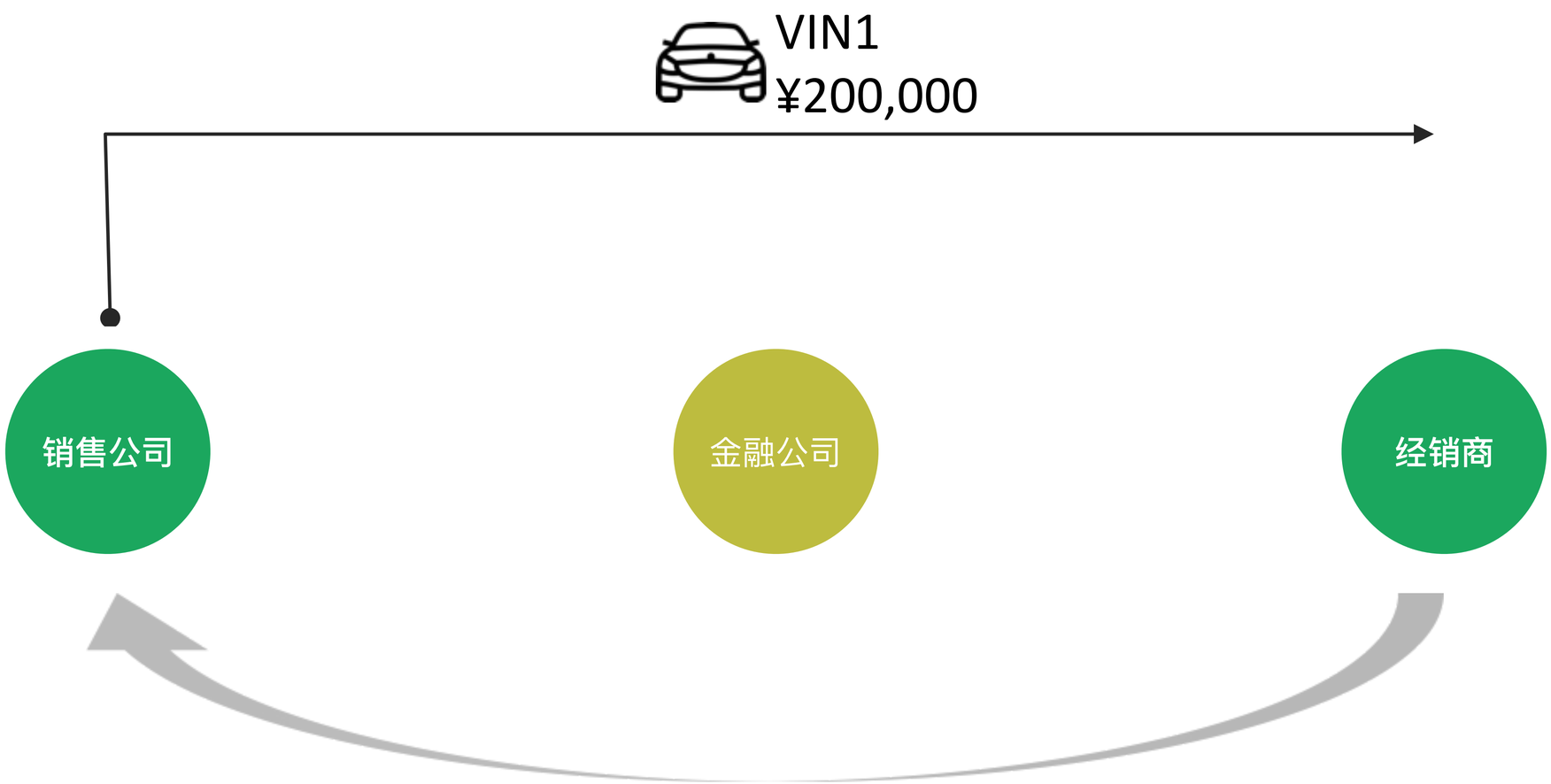
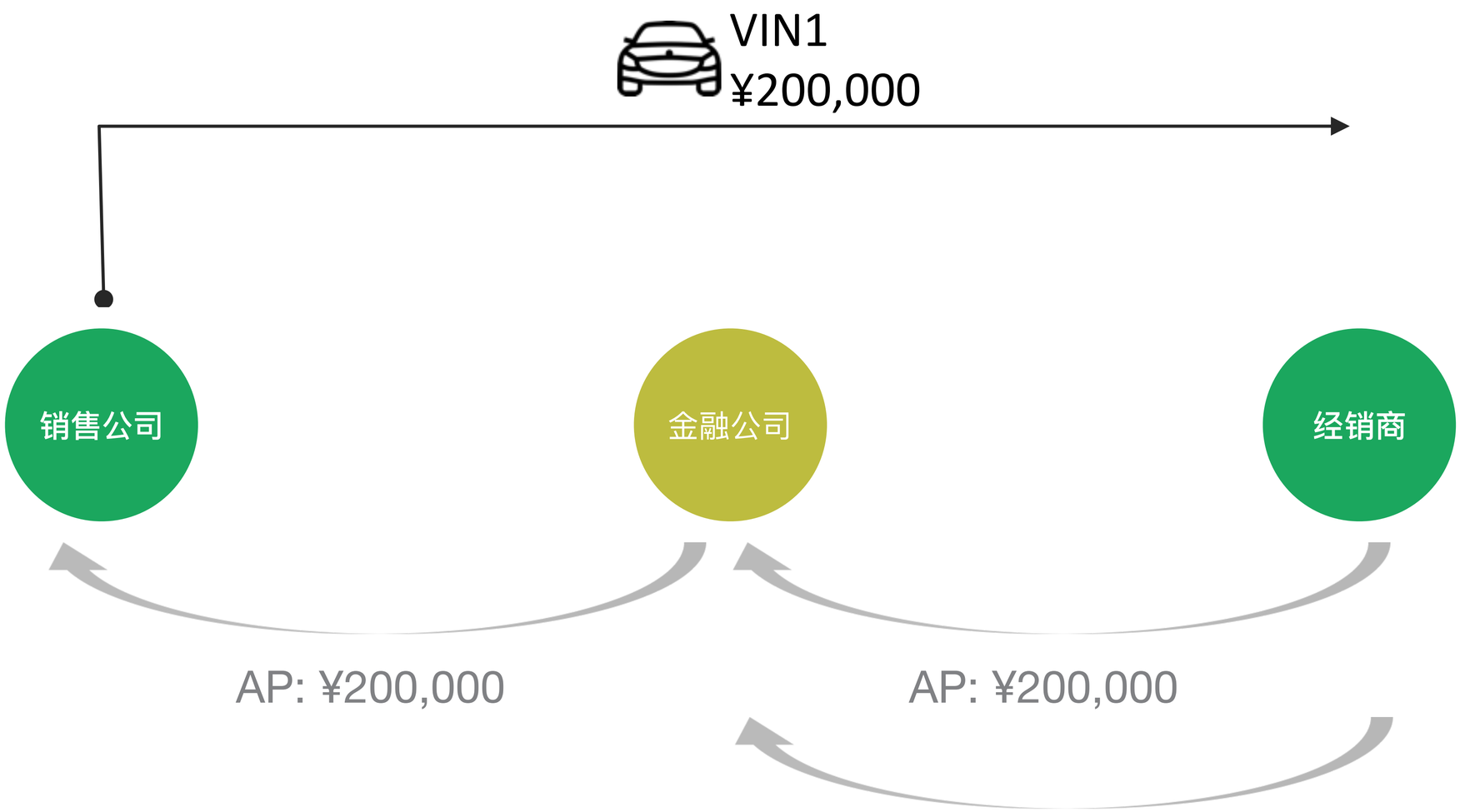
区块链+汽车金融

债

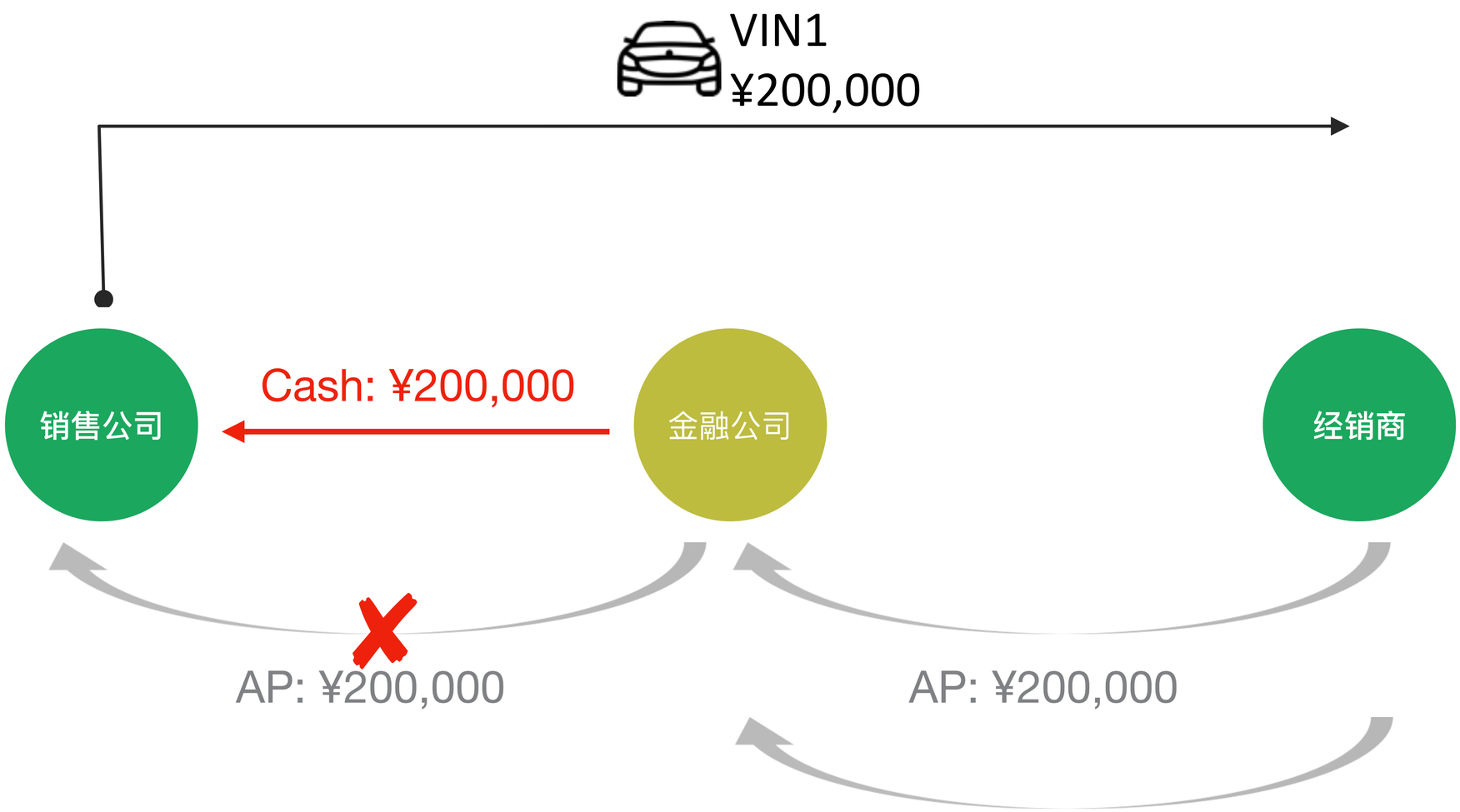


AP: ¥200,000

债

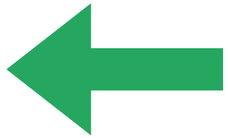


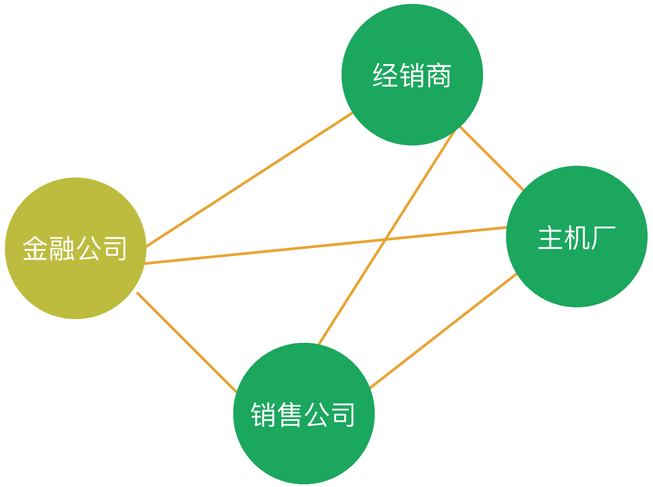
支付


VIN1
¥200,000
销售公司
Cash: ¥200,000
金融公司
经销商
AP: ¥200,000
AP: ¥200,000
AP: 利息

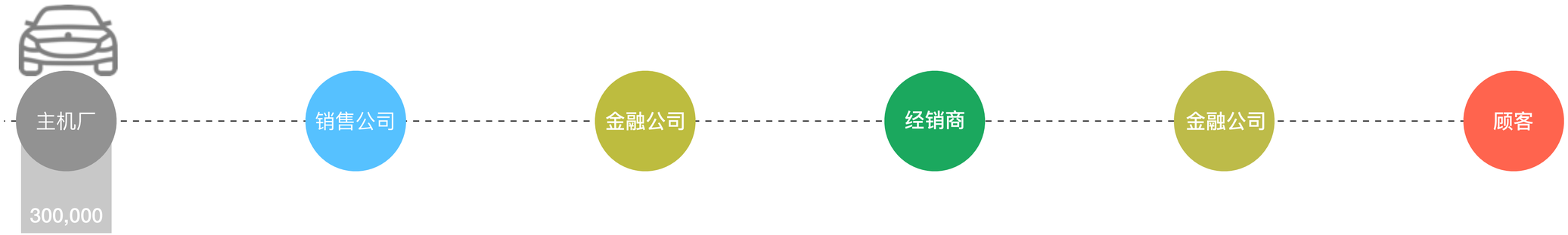
实时账本

应收账款：80,000,000 <RMB>		
1. 经销商 A 2. 经销商 B 3. 经销商 C 4. ...	50,000,000 20,000,000 10.000,000	2018-6-1 2018-7-1 2018-8-1
应付账款：50,000,000 <RMB>		
1. 销售公司 2. 经销商 A 3. 经销商 C 4. ...	40,000,000 5,000,000 5.000,000	2018-6-1 2018-7-1 2018-8-1

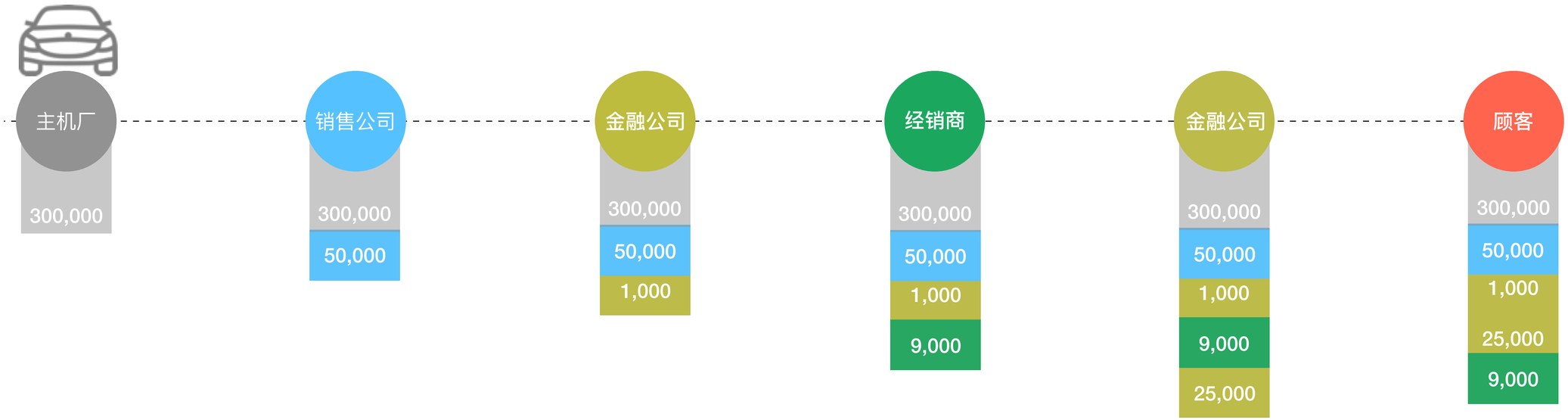




价值溯源

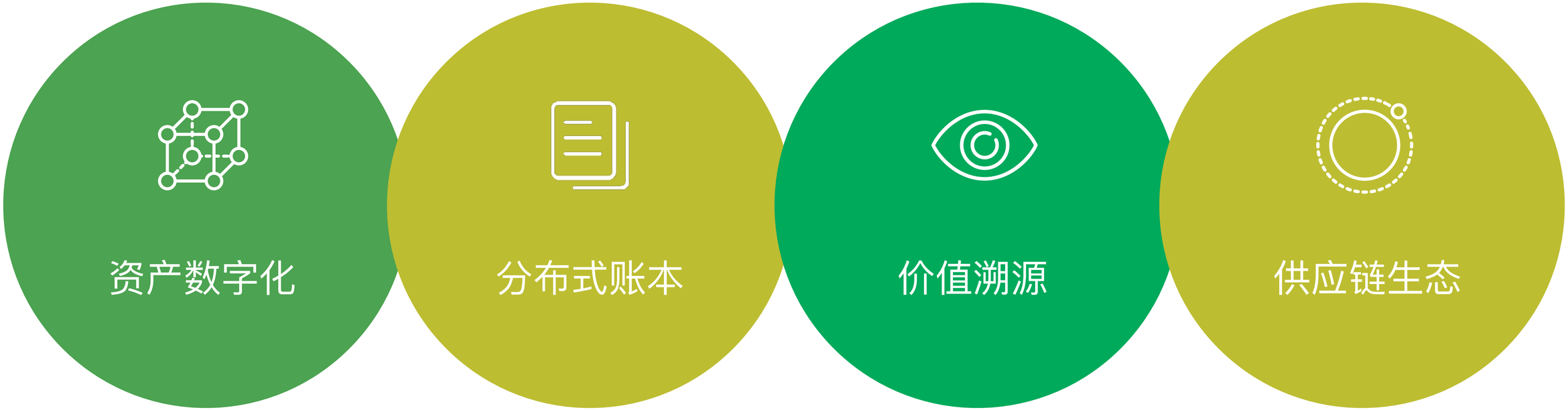


价值溯源


主机厂
300,000
销售公司
300,000
50,000
金融公司
300,000
50,000
1,000
经销商
300,000
50,000
1,000
9,000
金融公司
300,000
50,000
1,000
9,000
25,000
顾客
300,000
50,000
1,000
25,000
9,000

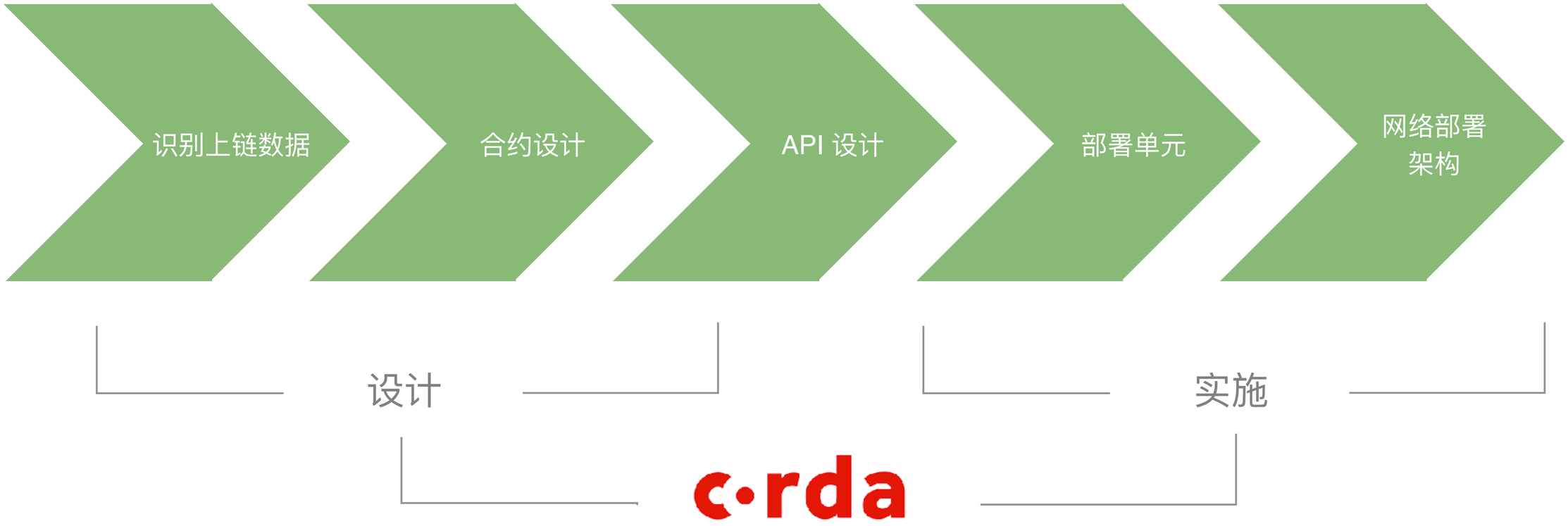
价值溯源

小结

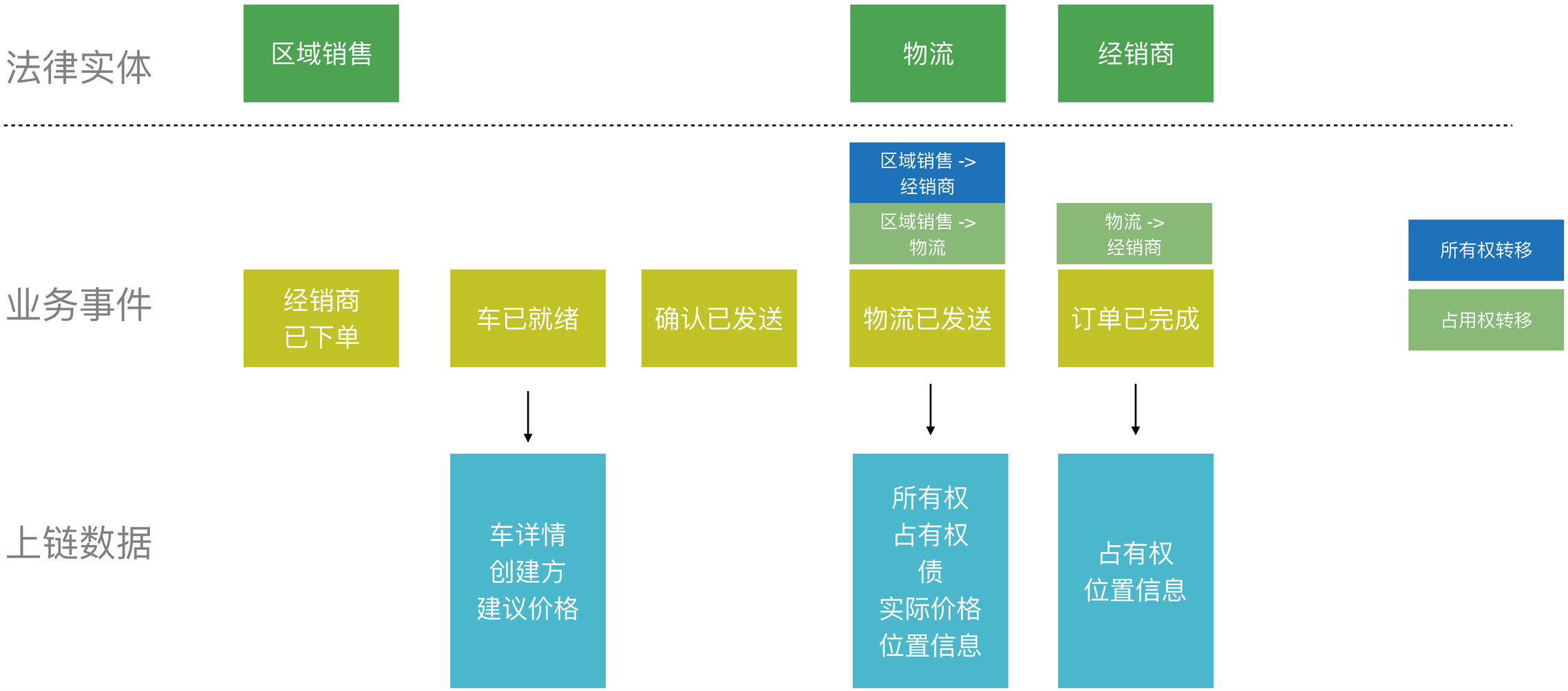


技术实现

设计和实施

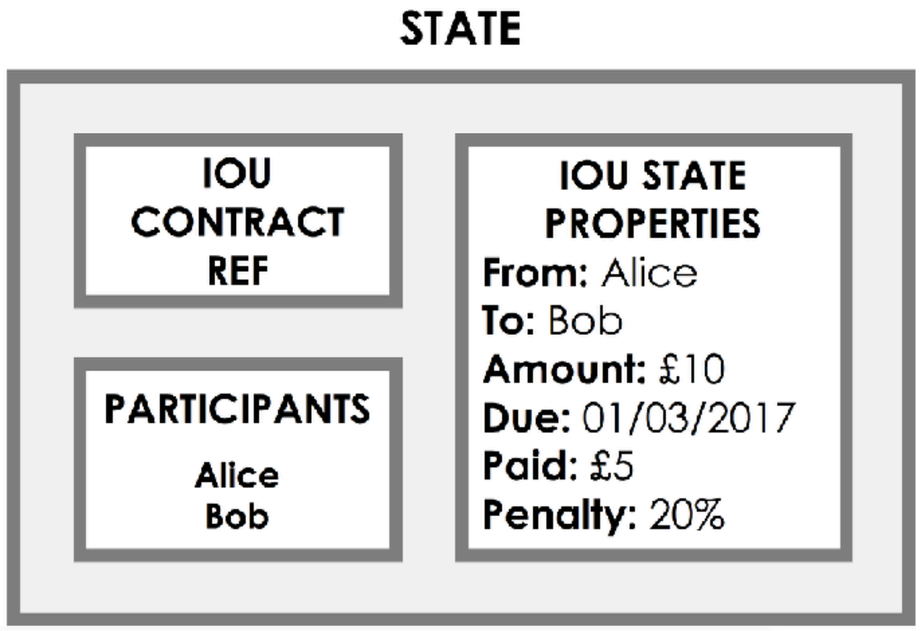


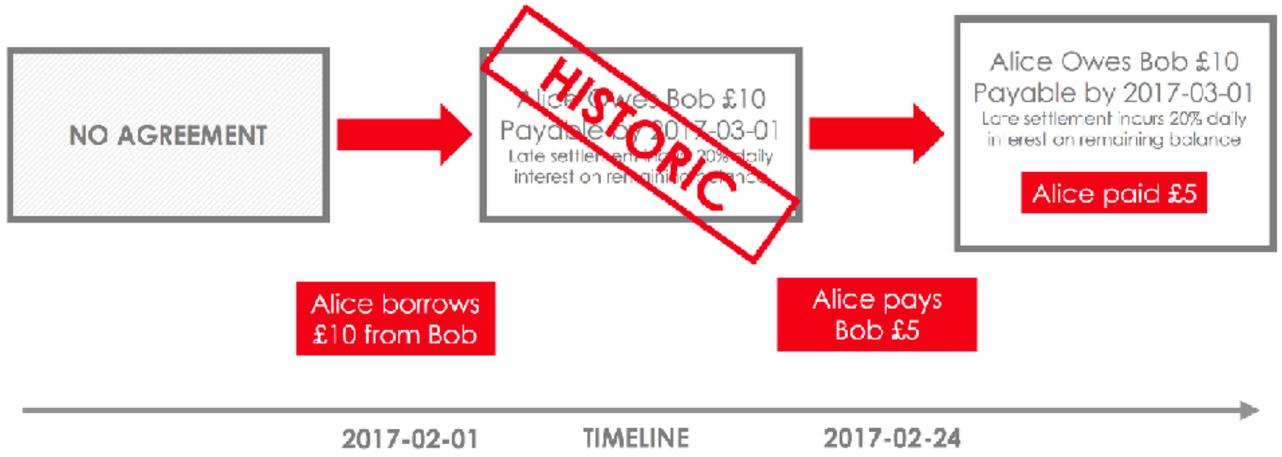
上链数据识别


法律实体
区域销售
物流
经销商
业务事件
经销商
已下单
车已就绪
确认已发送
区域销售 ->
经销商
区域销售 ->
物流
物流已发送
物流 ->
经销商
订单已完成
所有权转移
占用权转移
上链数据
车详情
创建方
建议价格
所有权
占有权
债
实际价格
位置信息
占有权
位置信息

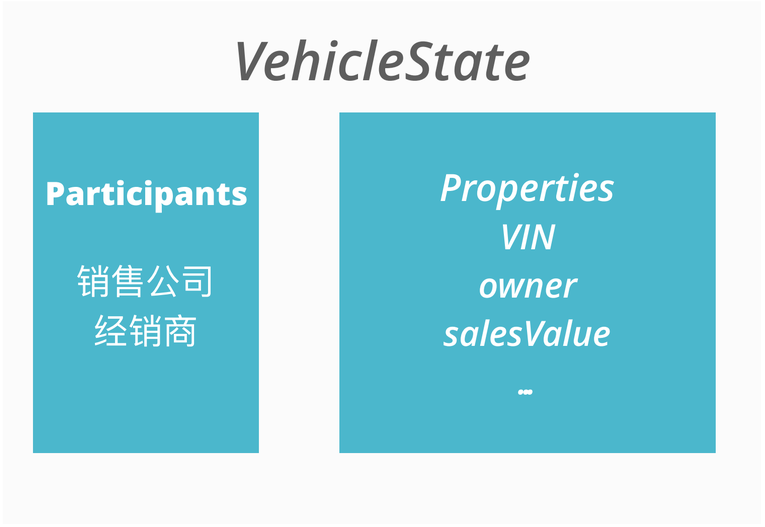
Corda state

corda 中的 state 代表在账本上某个时刻被一个或者多个节点共识的事实（fact）

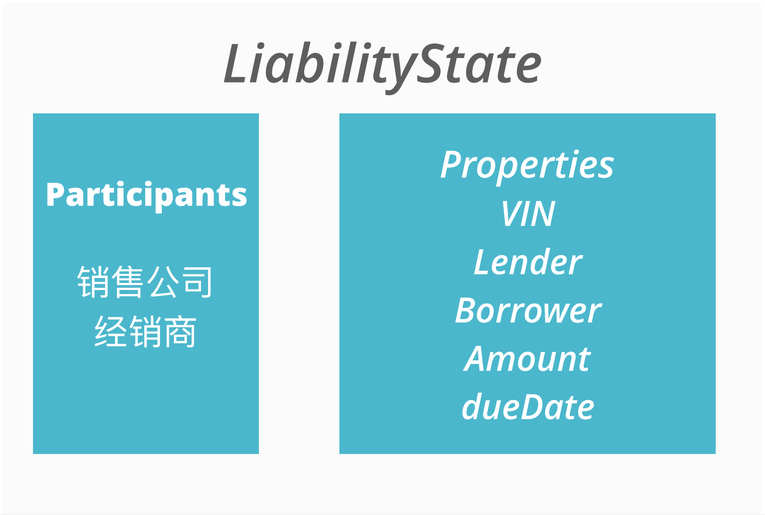




利用Corda state进行数据建模

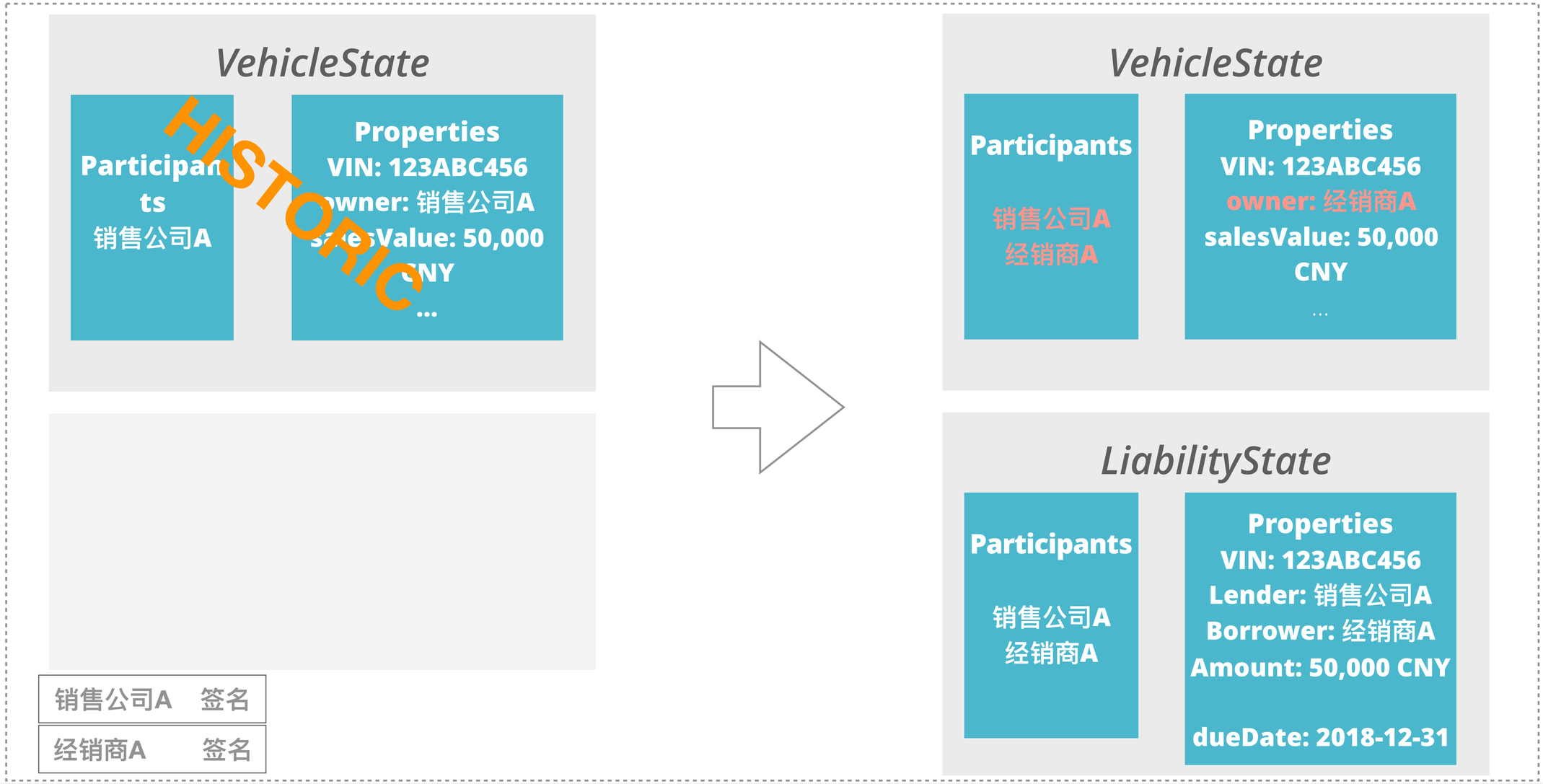



```kotlin
data class VehicleState(
        val VIN: String,
        val owner: AbstractParty,
        val salesValue: Amount<Currency>,
        override val linearId: UniqueIdentifier,
        override val participants: List<AbstractParty>) : LinearState
```




```kotlin
data class LiabilityState(
        val VIN: String,
        val lender: AbstractParty,
        val borrower: AbstractParty,
        val amount: Amount<Currency>,
        val dueDate: String,
        override val linearId: UniqueIdentifier,
        override val participants: List<AbstractParty>) : LinearState
```

UTXO (unspent transaction output)



智能合约实现

区域销售 → 经销商

所有权转移合约

该合约将唯一识别是 VIN 的车从 From 转移给 To 同时，产生一笔从 To 到 From 价值为 Amount 的债务，还款截止时间是 Date

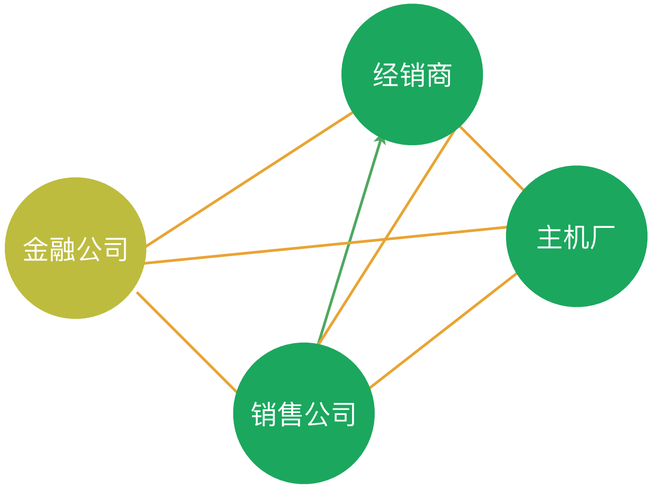
验证：
交易双方必须签名

合约模板

所有权转移合约

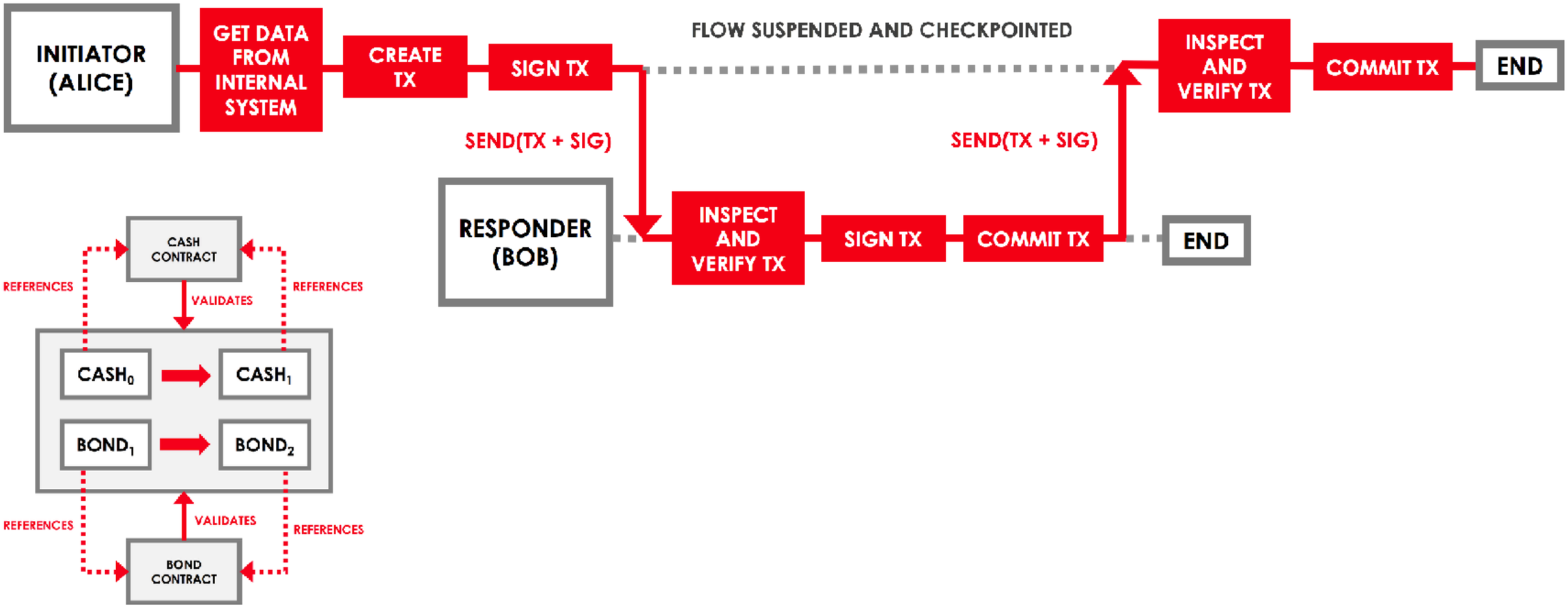
该合约将唯一识别是 123 的车从 销售公司 转移给 经销商
同时，产生一笔从 经销商 到 销售公司 价值为 50,000 CNY 的债务，还款截止时间是 2018-12-31
验证：
交易双方必须签名

合约实例



Corda flow and contract

Flow 就是一系列自动化的步骤告诉节点如何更新账本上的状态，Contract 用于验证交易的有效性



合约实现

kotlin

```
class VehicleTransferFlow(…) : FlowLogic<SignedTransaction>() {
 @Suspendable
 override fun call(): SignedTransaction {
     val inputVehicleState = find(VIN, owner)
     val outputVehicleState = inputVehicleState.withNewOwner(newOwner)
     val liabilityState = Liability(newOwner, owner, salesValue, date)

       val txBuilder = TransactionBuilder(firstNotary)
                     .addInputState(inputVehicleState)
                     .addOutputState(outputVehicleState, Vehicle_CONTRACT_ID)
                     .addOutputState(liabilityState, Liability_CONTRACT_ID)
                     .addCommand(Commands.Transfer…)

       txBuilder.verify(serviceHub)

       val ptx = serviceHub.signInit
       val session = initiateFlow(ne
```

Flow

kotlin

```
const val Vehicle_CONTRACT_ID =
“com.thoughtworks.VehicleStateContract”
class VehicleStateContract : Contract {
    override fun verify(tx: LedgerTransaction) {
        val command =
tx.commands.requireSingleCommand<Commands>()
        when (command.value) {
            is Commands.Transfer -> verifyTransfer(tx)
```

Contract

API 设计

POST `/vehicles/{vin}/transfers` vehicle transfer

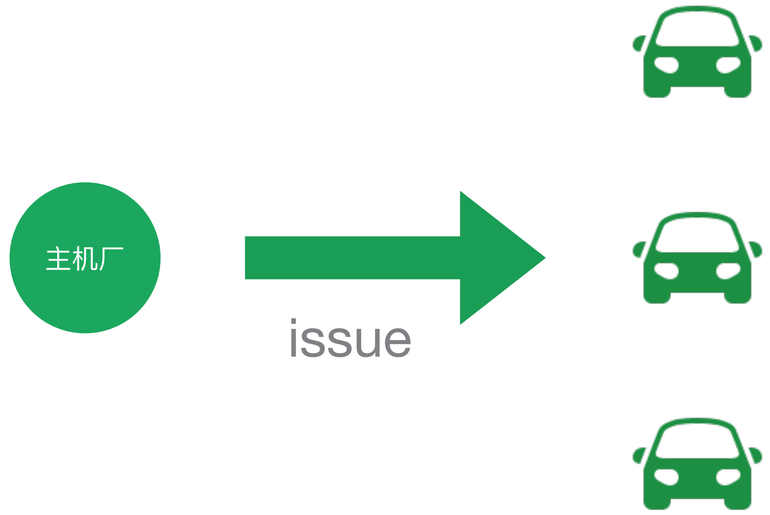
transfer a vehicle from owner to the new owner with a generated liability

Parameters Try it out

Name	Description
vin * required string *(path)*	vehicle unique Id, 123ABC456
body * required *(body)*	Example Value Model `{ "owner": "区块销售公司A", "newOwner": "经销商A", "salesValue": 500000 }` Parameter content type: application/json

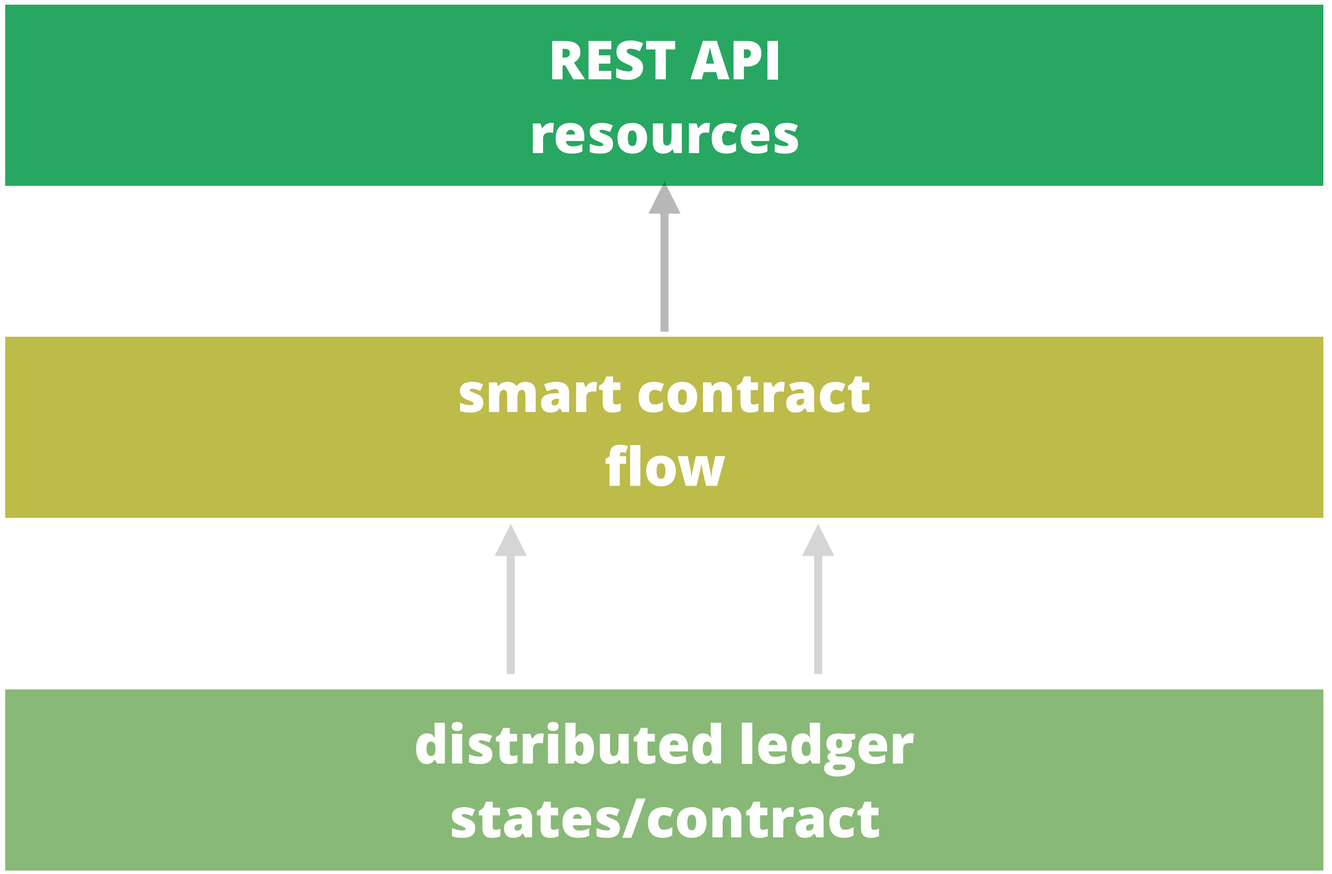
Responses Response content type: application/json

Code	Description
201	*Created*
400	*Bad Request*



① 识别资源
② 设计URI
③ 定义 REST API

平台分层架构

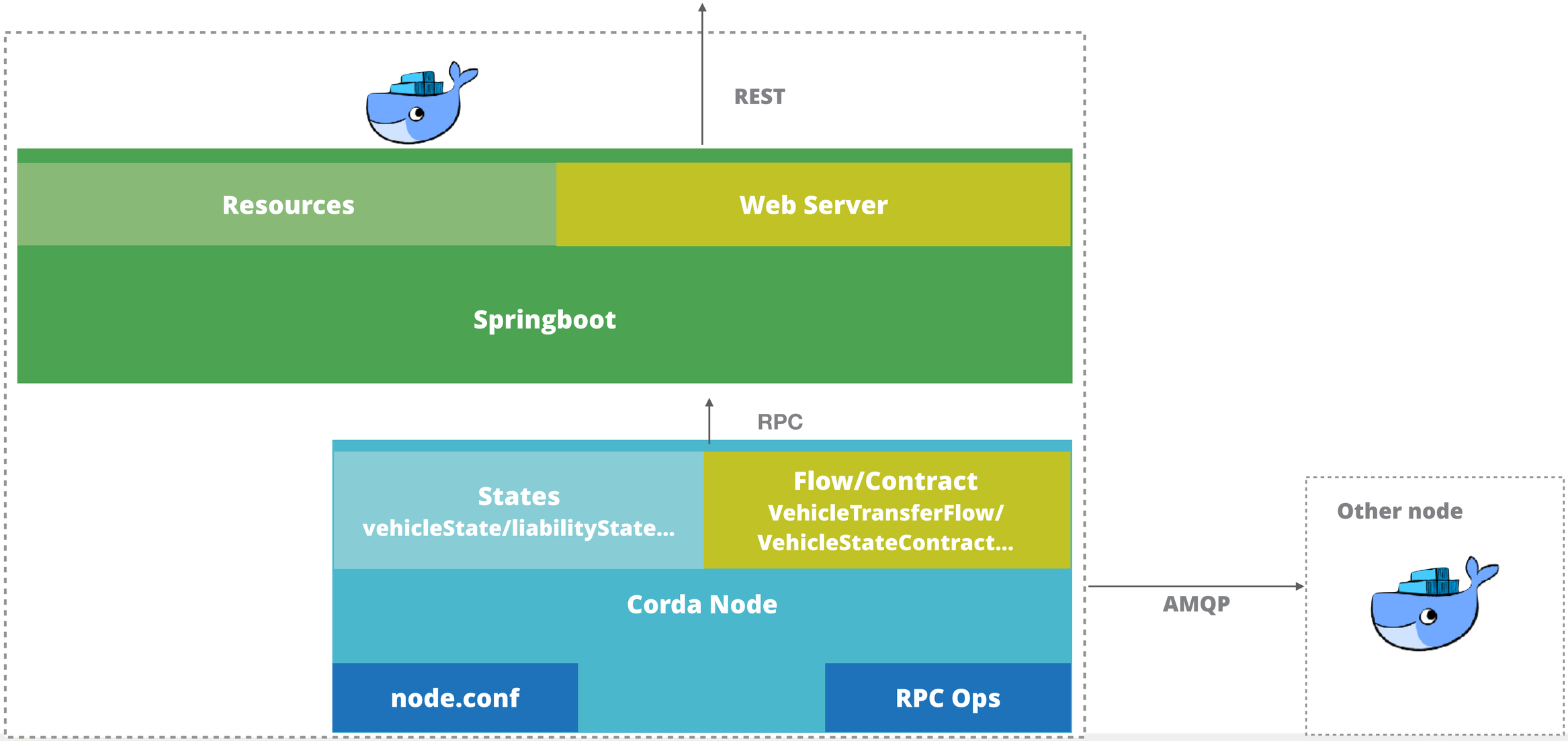


以资源方式呈现合约能力

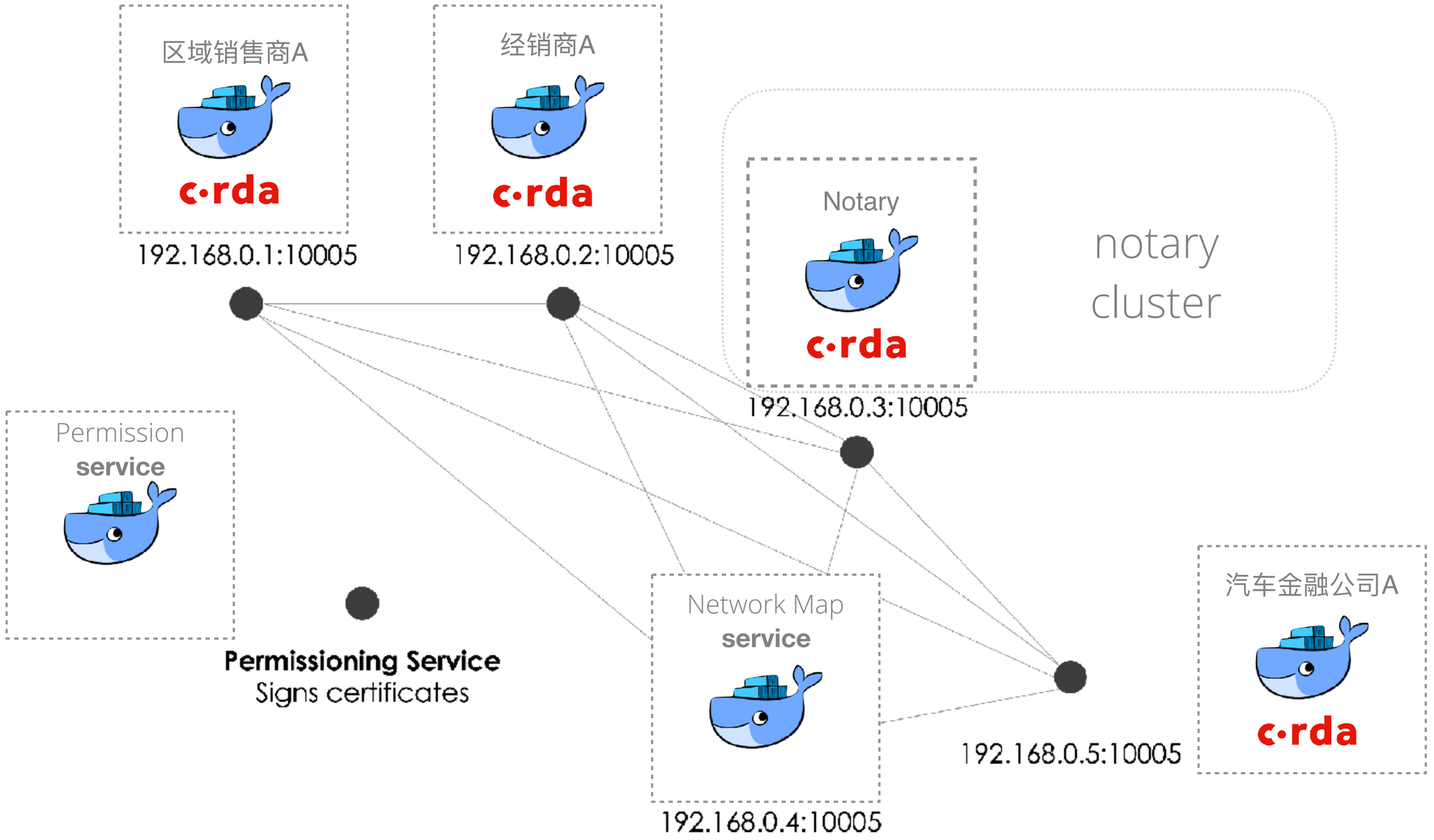
提供金融行业的相关合约

记录发生交易的事实，可追溯

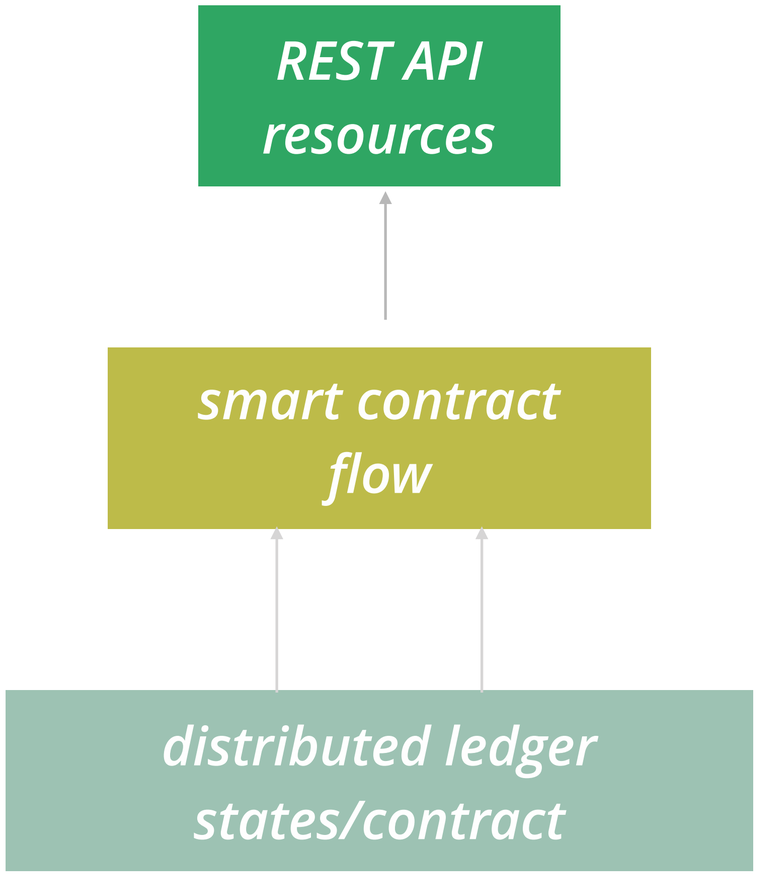
部署单元


REST
Resources
Web Server
Springboot
RPC
States
vehicleState/liabilityState...
Flow/Contract
VehicleTransferFlow/
VehicleStateContract...
Corda Node
node.conf
RPC Ops
AMQP
Other node

网络部署架构


区域销售商A
corda
192.168.0.1:10005
经销商A
corda
192.168.0.2:10005
Notary
corda
192.168.0.3:10005
notary
cluster
Permission
service
Permissioning Service
Signs certificates
Network Map
service
192.168.0.4:10005
192.168.0.5:10005
汽车金融公司A
corda

区块链汽车金融平台和传统平台的差异点



- 集成金融活动的调用点
- 编码汽车金融活动，减少交易摩擦
- 存储数字资产以及围绕资产的价值创造

ThoughtWorks

主办方 Geekbang 极客邦科技 InfoQ

THANKS