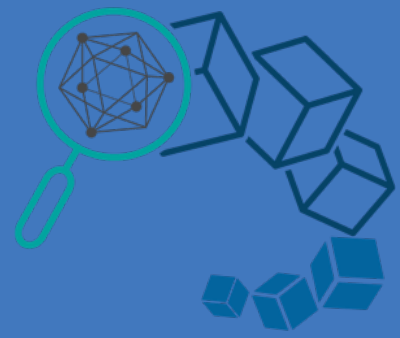
HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS



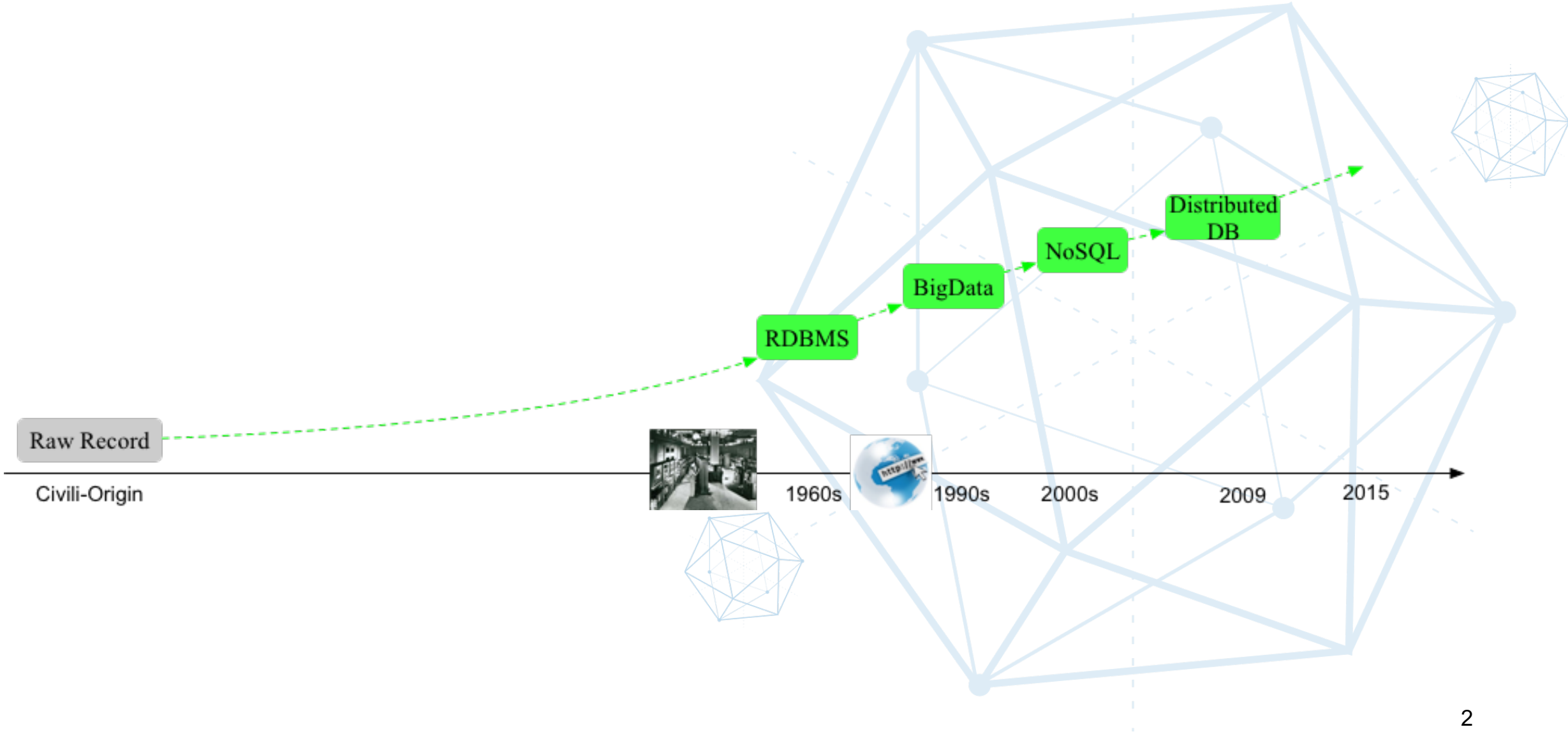
From Blockchain to Distributed Ledger

Overview, Challenges and Opportunities

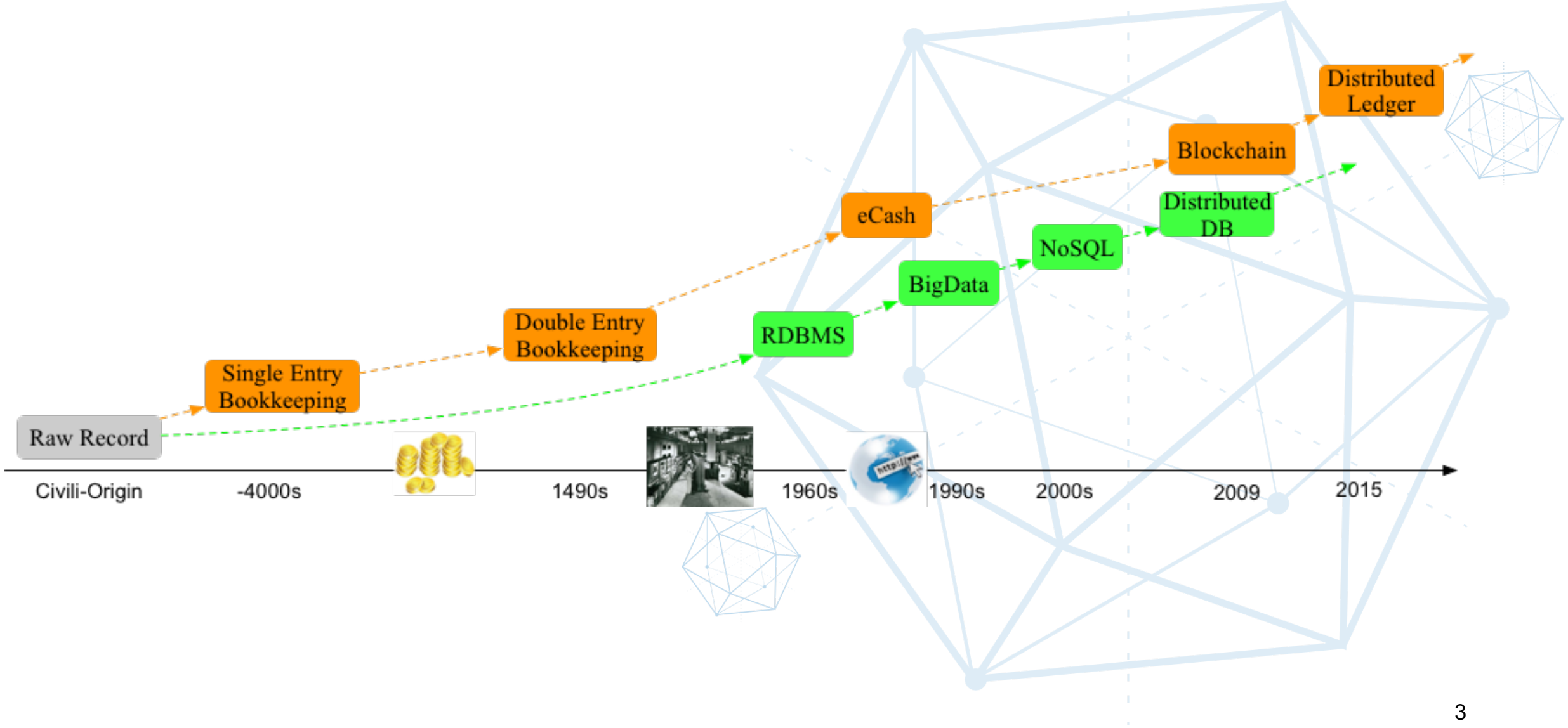
Baohua Yang

Oct 21, 2017

Database Technology Has Really Long History…



And Ledger Technologies…



Blockchain to DLT in Open-source

- Bitcoin
  - Focus on payment
  - Limit in smart contracts, performance…
- Ethereum
  - Improve performance
  - More smart contracts
- Hyperledger
  - Enterprise grade ledgers (IBM, Oracle, Intel, Cisco, DTCC, R3, NEC, JP Morgan, DAH, Accenture, SAP, Wanda, Huawei, CMB…)
  - Permission, more consensus, pluggable…
  - Smart contracts in Go, Java, and more

Introducing Hyperledger

Open source collaborative effort to advance cross-industry **blockchain technologies**

Hosted by **The Linux Foundation,** fastest-growing project in LF history

Global collaboration spanning finance, banking, IoT, supply chains, healthcare, manufacturing, technology and more.

Hyperledger Modular Umbrella Approach

Infrastructure

Technical, Legal, Marketing, Organizational

Ecosystems that accelerate open development and commercial adoption

THE LINUX FOUNDATION

Cloud Foundry | Node.js | **Hyperledger** | Open Container Initiative

Frameworks

Meaningfully differentiated approaches to business blockchain frameworks developed by a growing community of communities

Hyperledger **Indy** | Hyperledger **Fabric** | Hyperledger **Iroha** | Hyperledger **Sawtooth** | Hyperledger **Burrow**

Tools

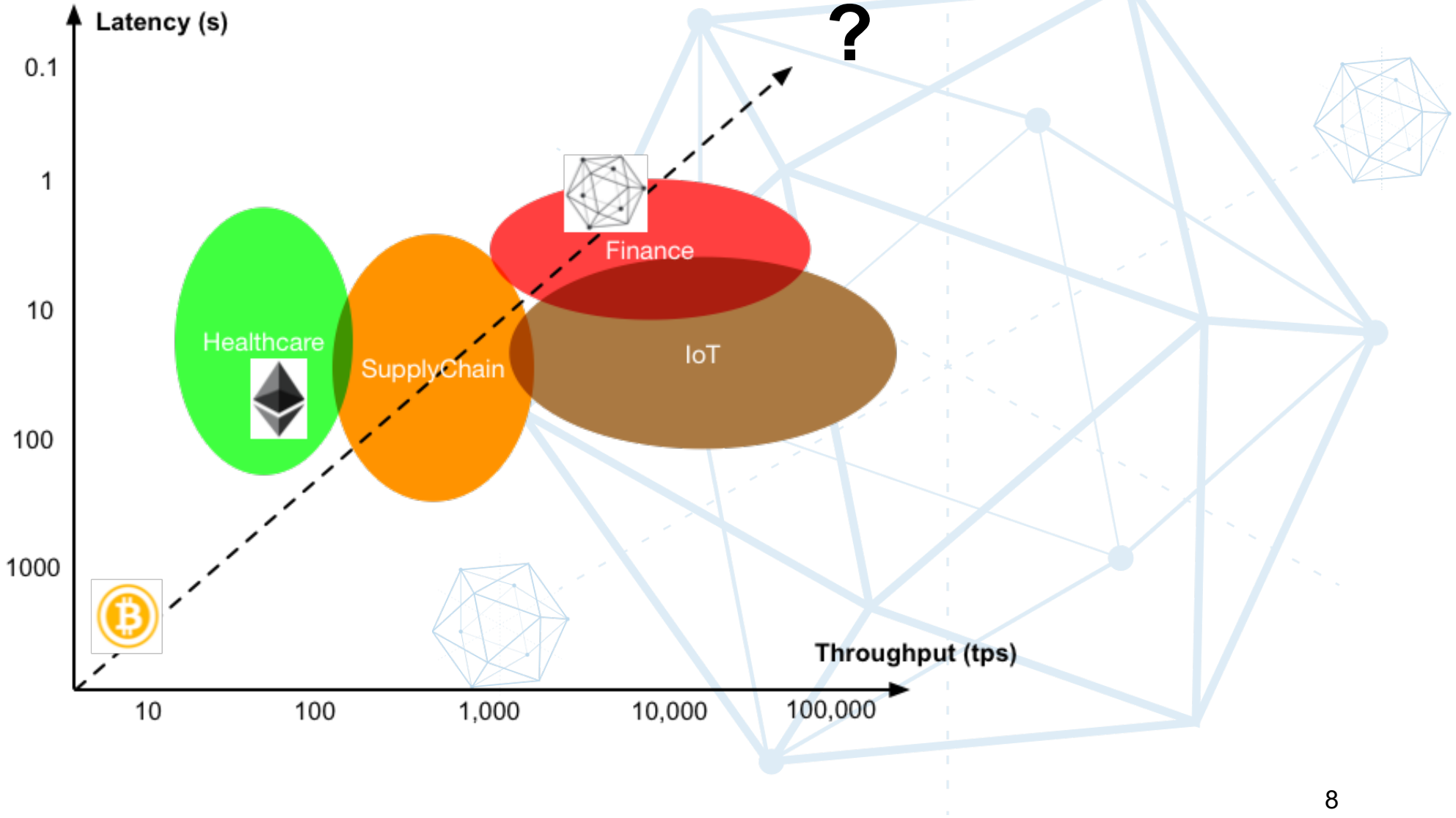
Typically built for one framework, and through common license and community of communities approach, ported to other frameworks

Hyperledger **Composer** | Hyperledger **Explorer** | Hyperledger **Cello**

Hyperledger Business Blockchain Frameworks

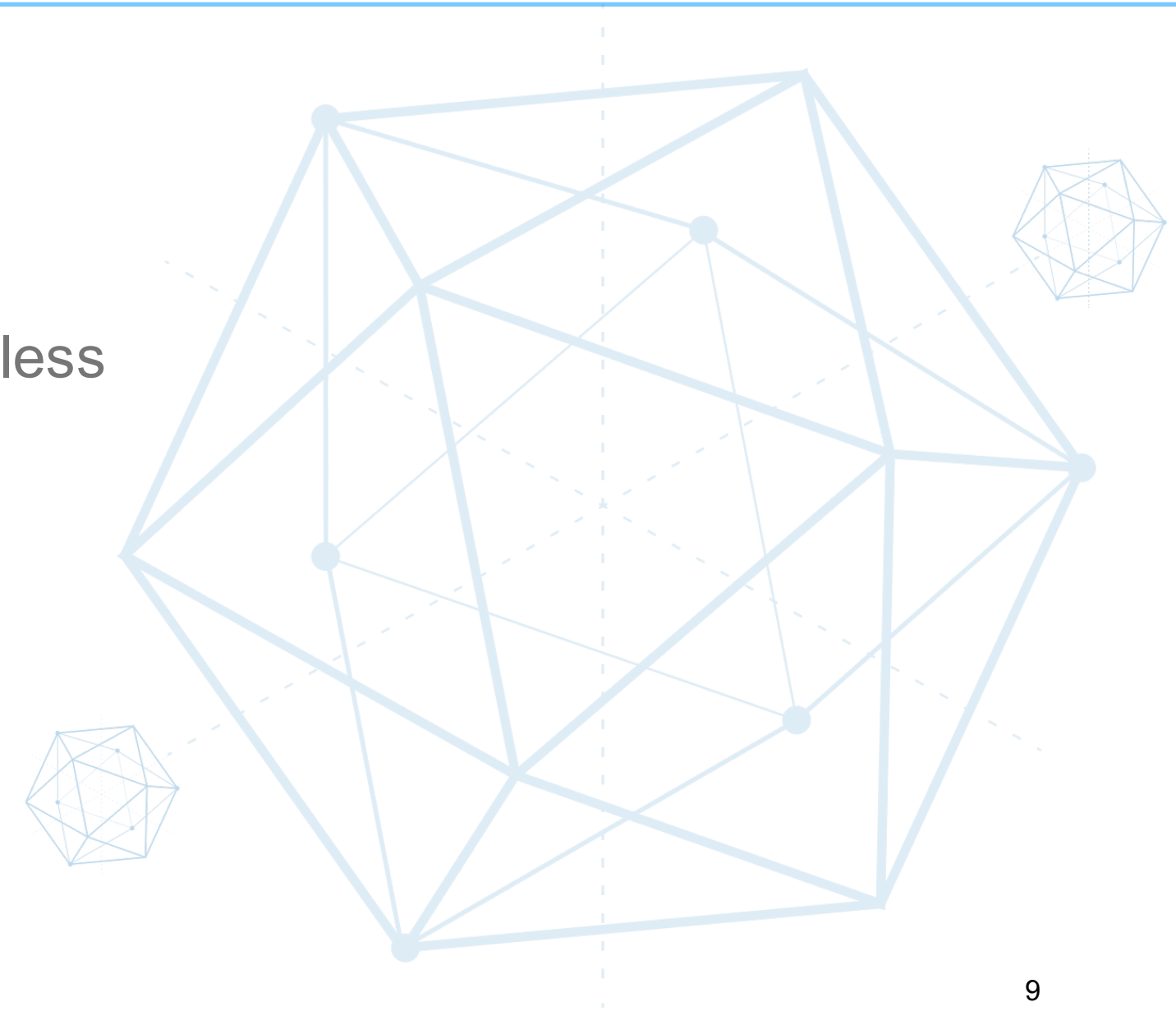
- **Hyperledger Fabric**: Intended as a foundation for developing applications or solutions with a modular architecture, Hyperledger Fabric allows components, such as consensus and membership services, to be plug-and-play.
- **Hyperledger Iroha**: A business blockchain framework designed to be simple and easy to incorporate into infrastructural projects requiring distributed ledger technology.
- **Hyperledger Sawtooth**: A modular platform for building, deploying, and running distributed ledgers. Hyperledger Sawtooth includes a novel consensus algorithm, Proof of Elapsed Time (PoET), which targets large distributed validator populations with minimal resource consumption.
- **Hyperledger Burrow**: A permissionable smart contract machine. The first of its kind when released in December, 2014, Burrow provides a modular blockchain client with a permissioned smart contract interpreter built in part to the specification of the Ethereum Virtual Machine (EVM).
- **Hyperledger Indy**: Tools, libraries, and reusable components for providing digital identities rooted on blockchains or other distributed ledgers so that they are interoperable across administrative domains, applications, and any other silo.

Performance? It depends!



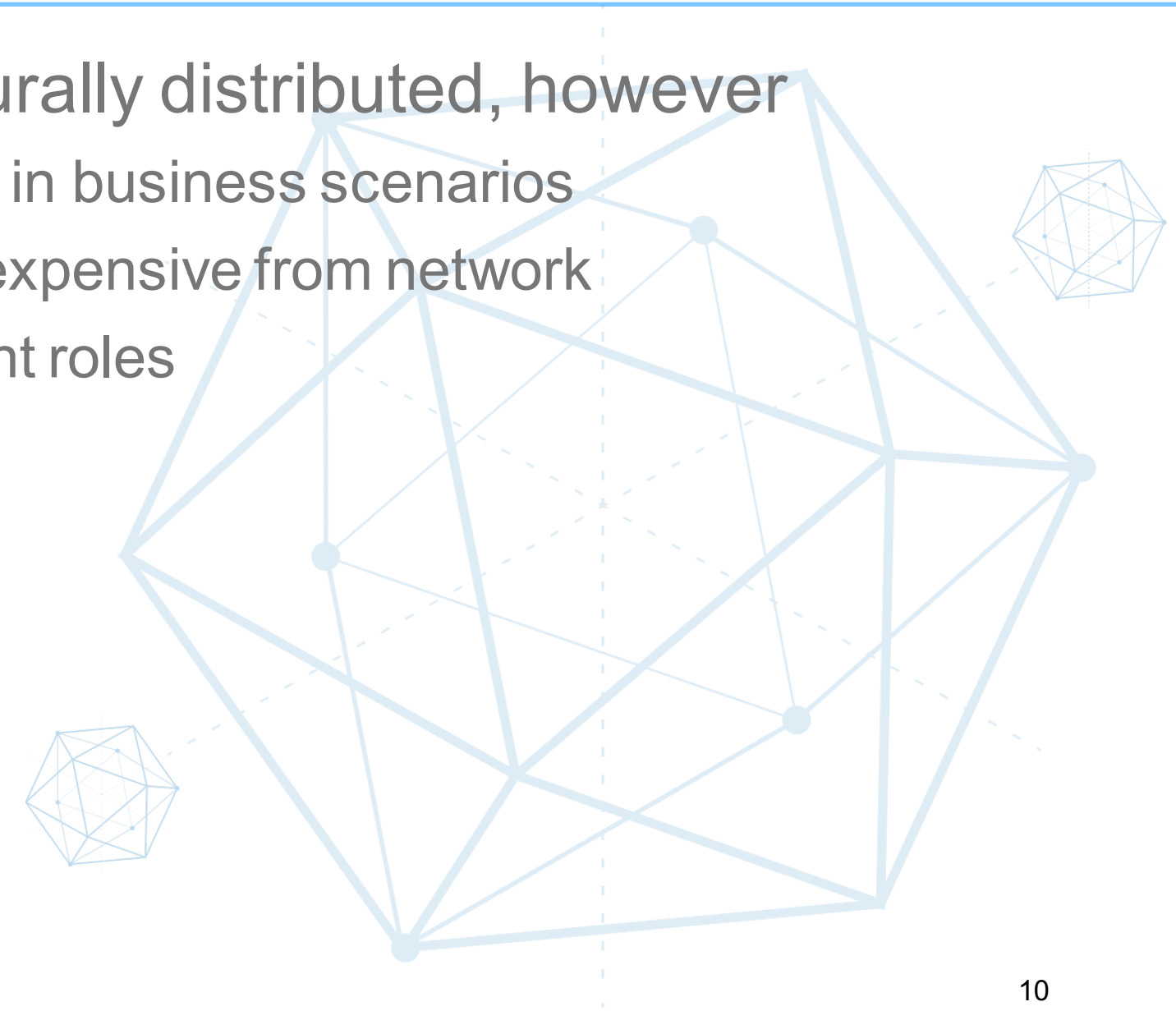
Consensus? More complicated!

- Requirements in DLT
  - CFT vs BFT
  - Probability vs Deterministic
  - Permissioned vs Permissionless
  - Trust vs Trustless
  - Consistency vs Correctness



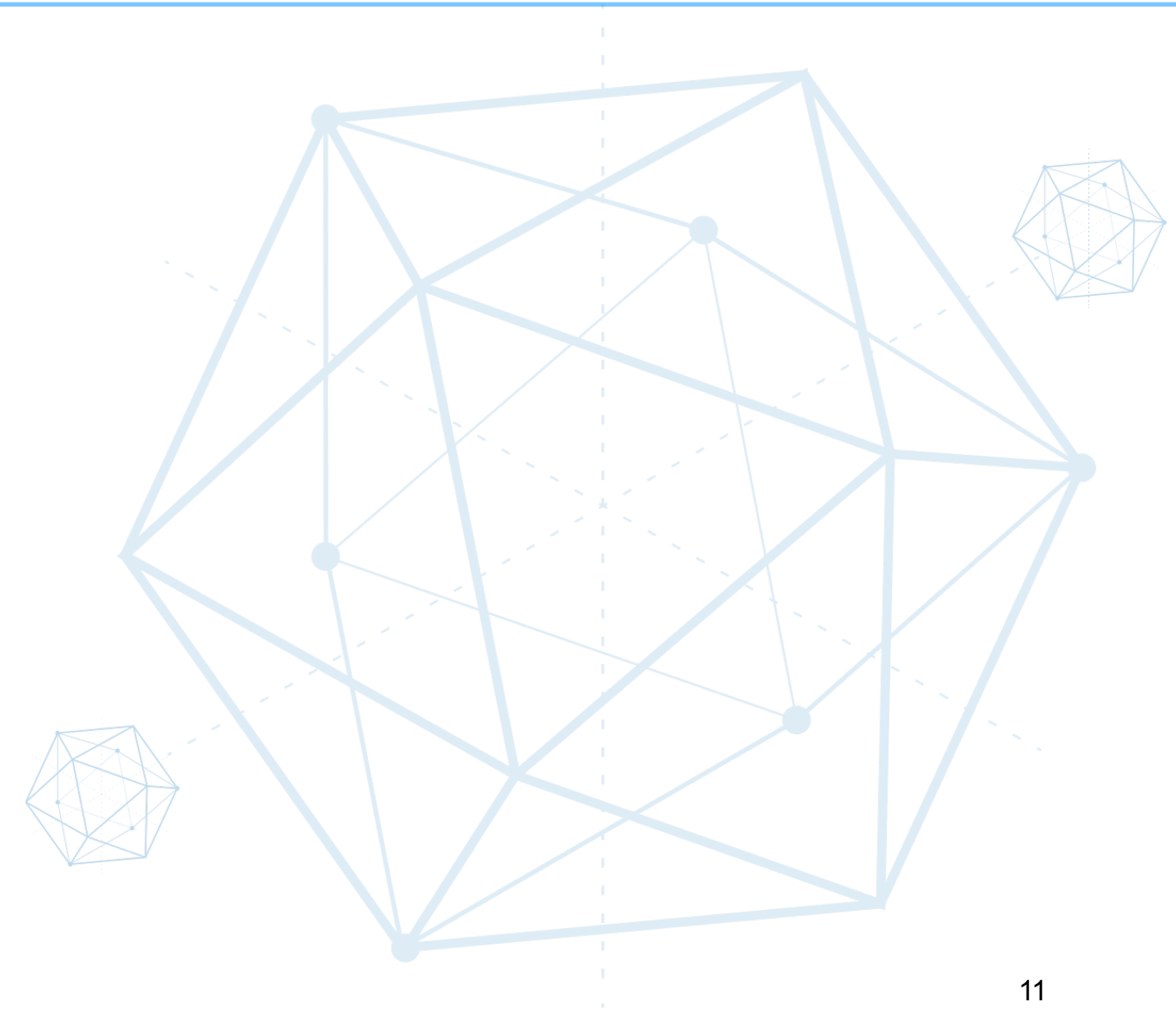
Failure Resilience? More important!

- Blockchain system is naturally distributed, however
  - Availability is highly required in business scenarios
  - Recovery operation is time-expensive from network
  - Nodes may vary with different roles
  - Permission!!!



Security&Crypto? More challenging!

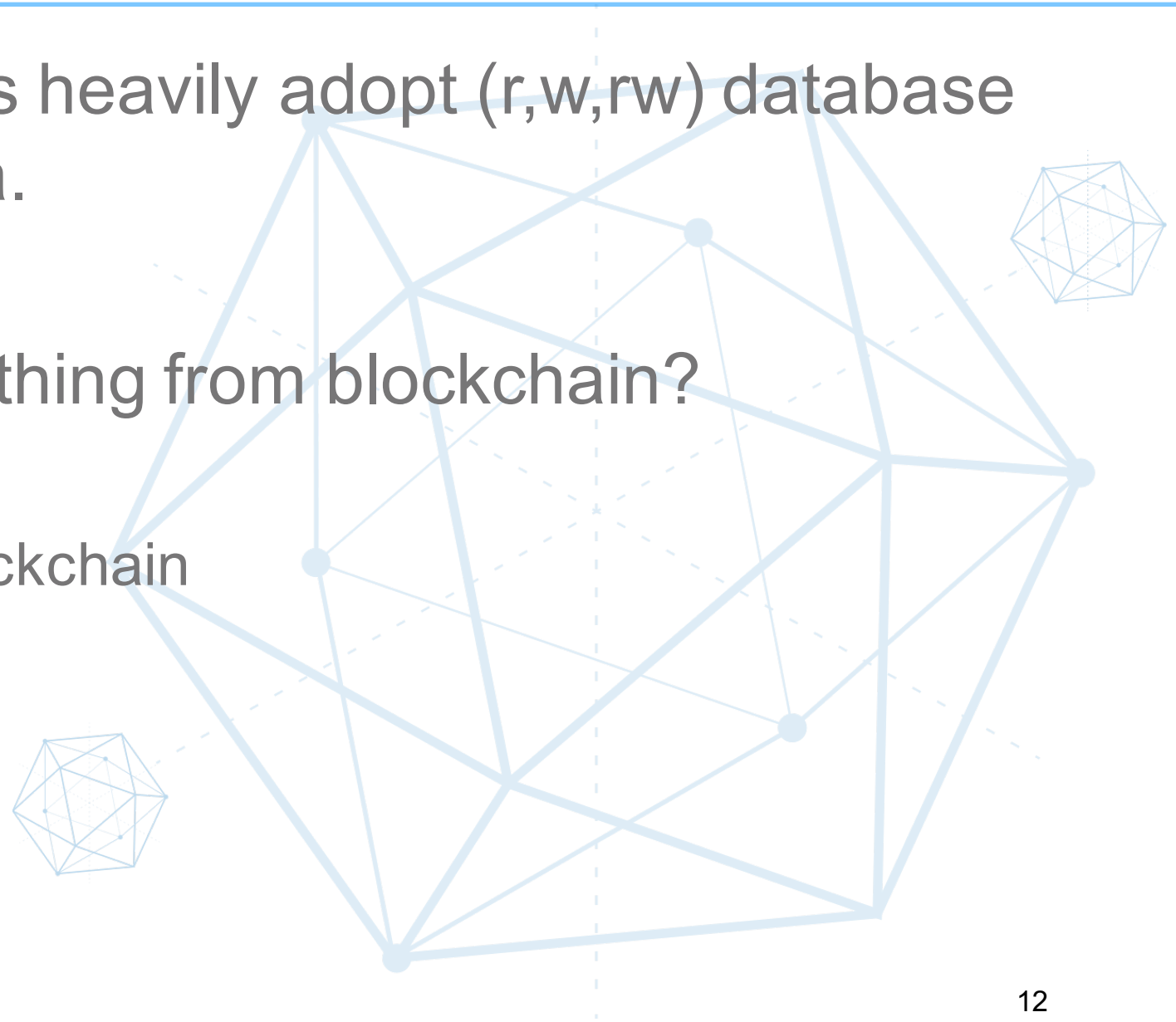
- Privacy
- Auditability
- New cracking tools



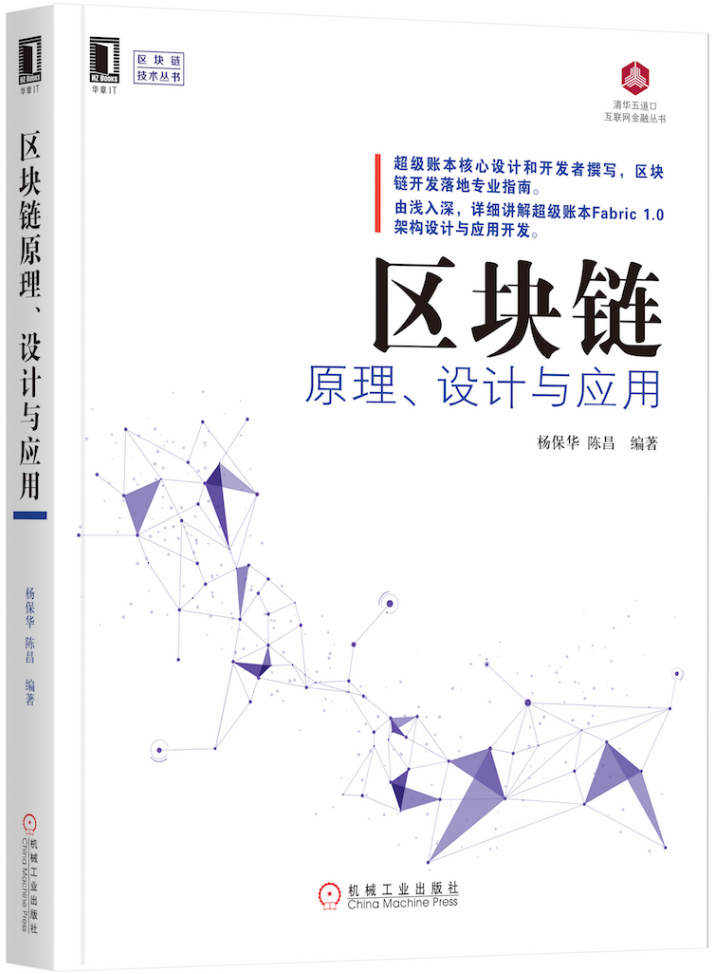
Database and ledgers could benefit each other?

- Distributed ledger systems heavily adopt (r,w,rw) database technologies for local data.

- Database can learn something from blockchain?
  - Ledger efficient DB
  - Distributed DB based on Blockchain
  - More?



Latest Publish!



- 本书由超级账本全球技术委员会委员、核心设计和开发者编撰，得到企业界、学术界、技术界、开源社区国内外专家联袂推荐。
- 本书由浅入深，详细讲解超级账本等项目架构设计精华与应用开发案例，是区块链与分布式账本开发落地专业指南。

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Questions?

Thank You!
@baohua

Slides available at github.com/yeasy/seminar-talk#hyperledger