



Blockchain in practice

Johan Toll, AVP, NASDAQ Market Technology

October, 2017

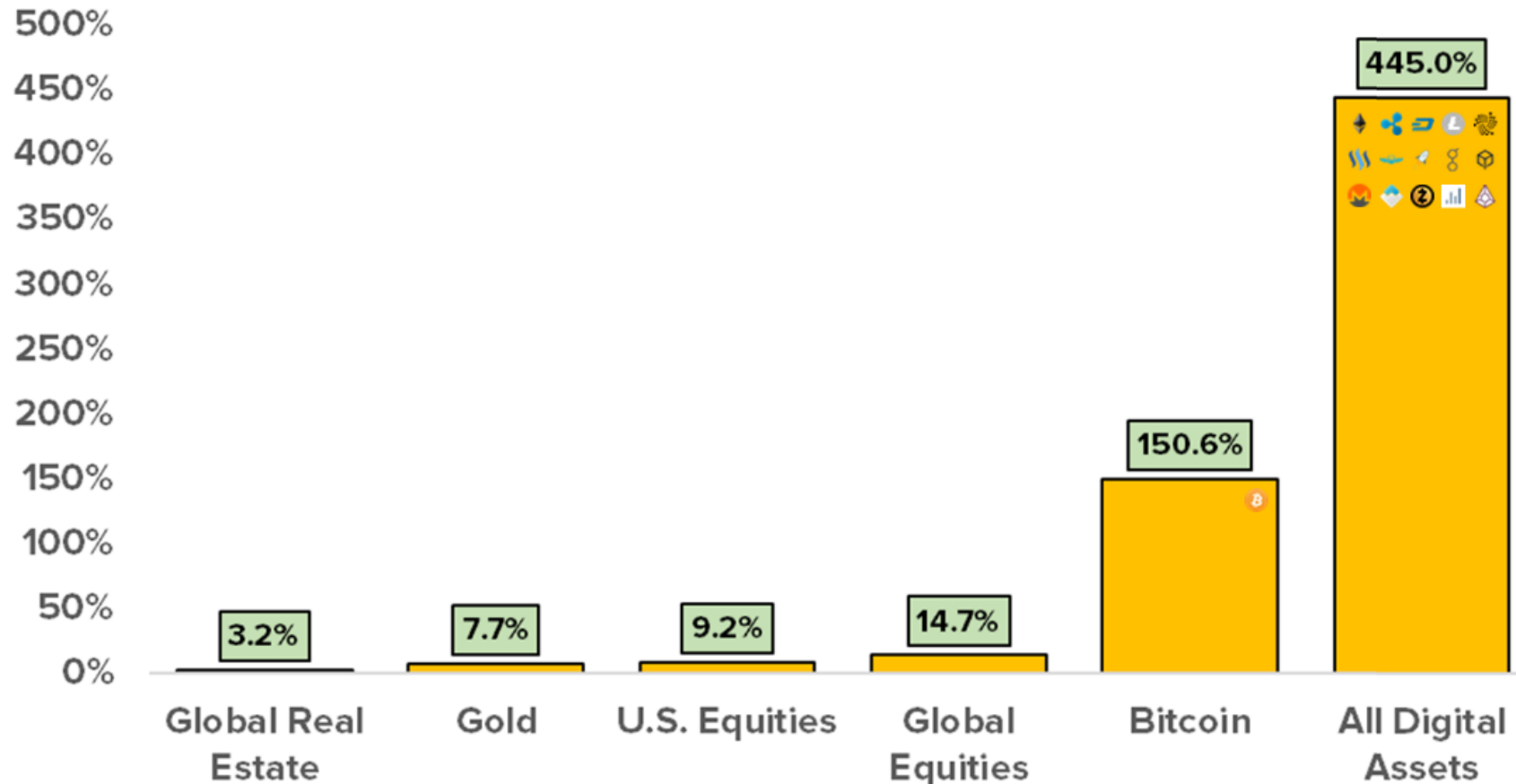




The state of blockchain

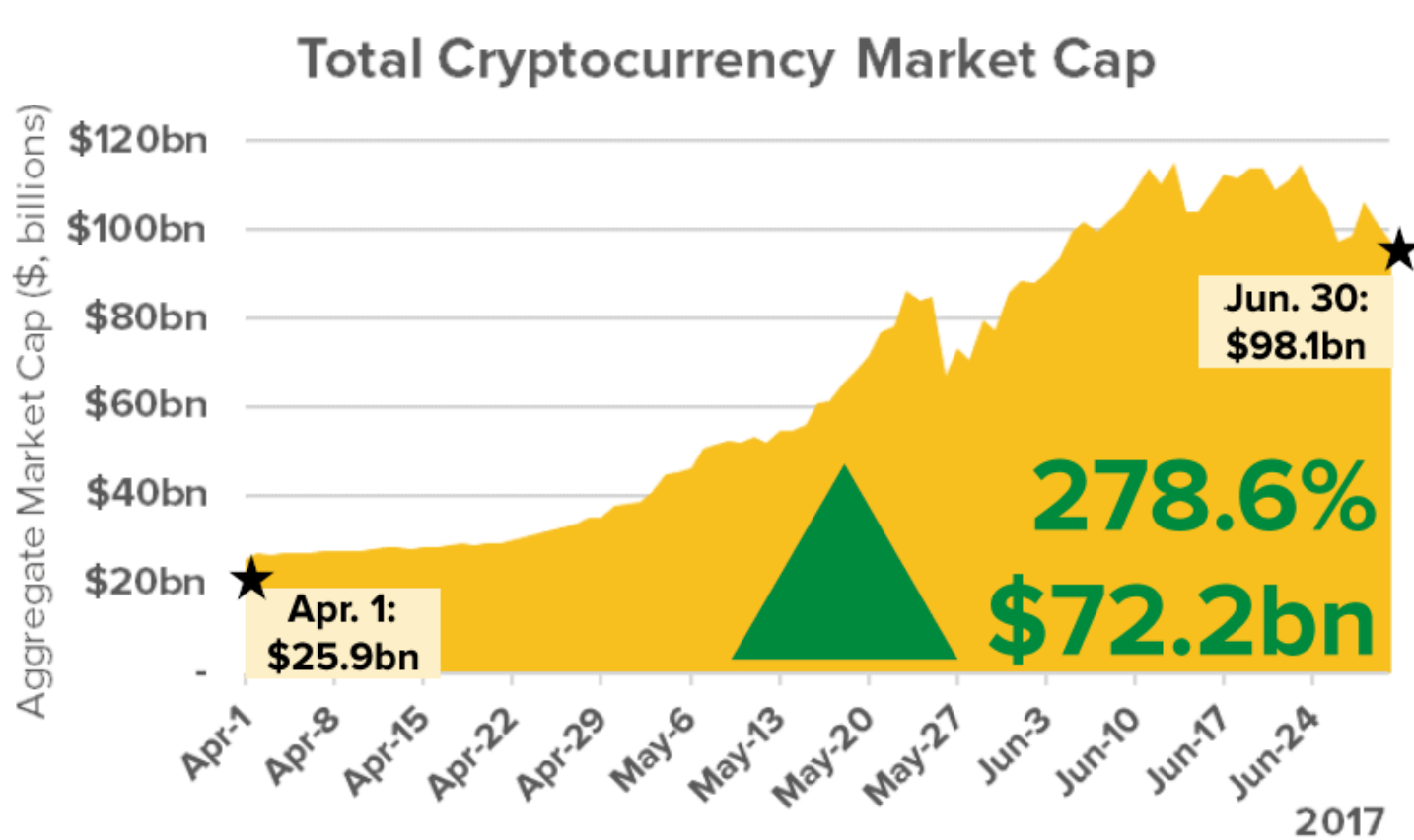
PUBLIC BLOCKCHAIN ASSETS DRAMATICALLY OUTPERFORMS TRADITIONAL ASSETS

2017 YTD Returns



Source: Coindesk

AGGREGATE CRYPTOCURRENCY MARKET CAP RALLIES 4X, BREAKS \$100BN IN Q2



For some context, the market cap of:

Western Union ≈ \$10 billion

Ether ≈ \$30 billion

Bitcoin ≈ \$40 billion

All Cryptocurrencies ≈ \$100 billion

Visa ≈ \$200 billion

Gold ≈ \$7 trillion

Source: Coindesk

EXCHANGES ACTIVE IN THE BLOCKCHAIN SPACE

- **Nasdaq**, launched several PoCs and pilots, working actively in several areas with focus to put networks in production
- **Australian Stock Exchange** began to evaluate replacement options for the Clearing House Electronic Subregister System (CHES) in 2015. Decision point end of 2017
- **Japan Exchange Group** and IBM are working towards testing the potential of blockchain technology for use in trading in low transaction markets
- **Korea Exchange** launched Korea Startup Market (KSM) to enable equity shares of startup companies to be traded in the open market
- **Deutsche Börse** and Deutsche Bundesbank presented a functional prototype for settlement of securities
- **National Stock Exchange of India** conducted a trial involving country's leading banks related to know-your-customer (KYC) data
- **Moscow Exchange** successfully conducted e-voting for bondholders via blockchain at the National Settlement Depository (NSD).
- **London Stock Exchange, Santiago Stock Exchange, TMX Group, etc.** involved in prototypes on blockchain



ENTERPRISE BLOCKCHAINS RAMPING UP

Forums / Consortia

- **Hyperledger foundation** member counts continue to rise.
- **Ethereum Enterprise Alliance** increase in size of members (150+ members)
- **R3**, the bank collaboration platform, raises 107MUSD VC round

Distributed Ledger solutions

- **Hyperledger fabric** - moving towards production maturity
- **Corda** – allowing open usage and testing of platform
- **Ethereum** – public chain for as a distributed compute platform
- **Chain** – launching “Sequence” a platform as a service offering
- **And others:** Sawtooth lake, Iroha, Cobalt’s DLT



STATE OF BLOCKCHAIN – KEY HIGHLIGHTS

**Cryptocurrency
rally**

**ICOs exceed VC
funding**


**Transaction
volumes and
fees are up**

**Permissioned
blockchains
advance**

**Regulators
acknowledge
reality**

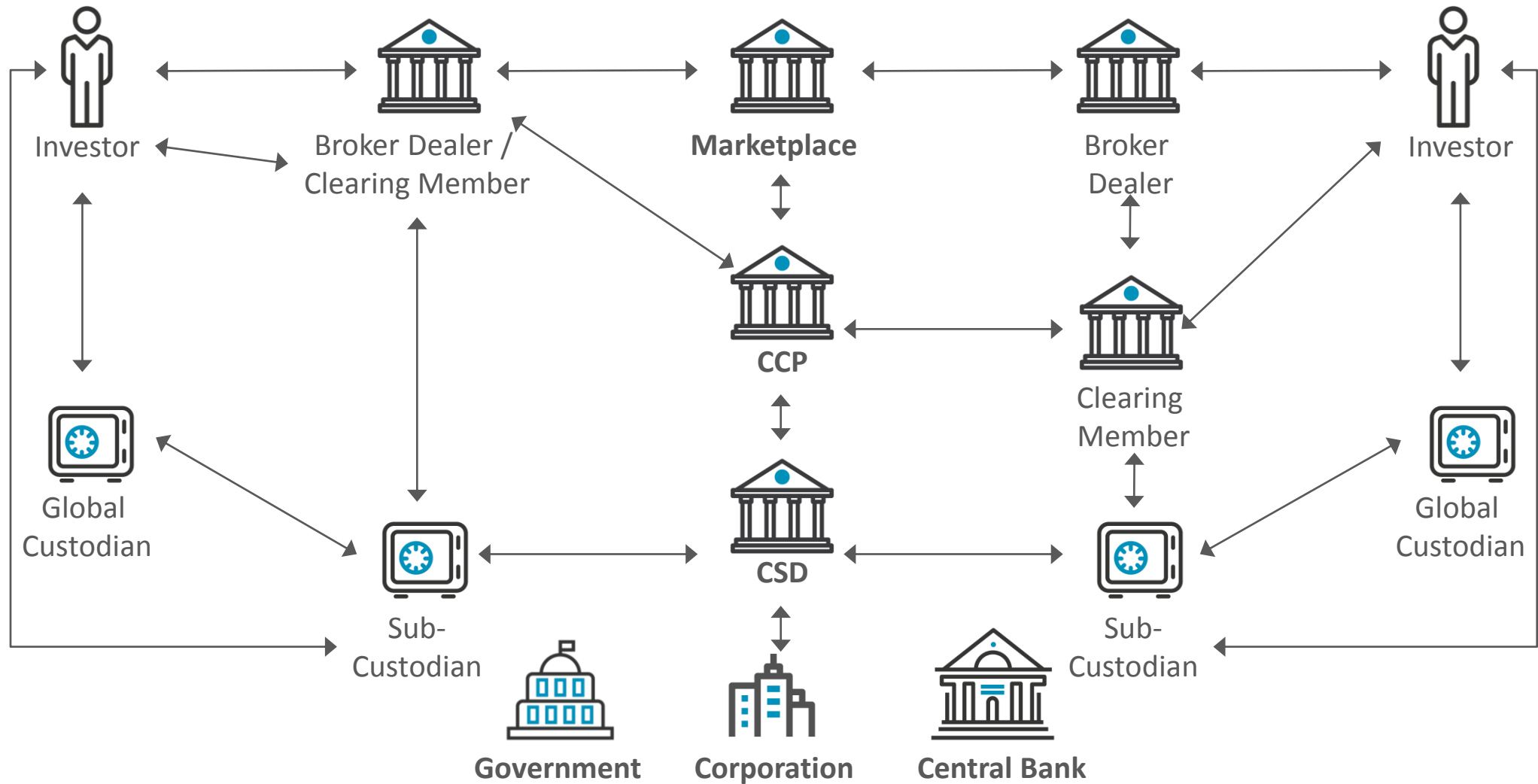
**Focus on
interoperability**

Source: Coindesk

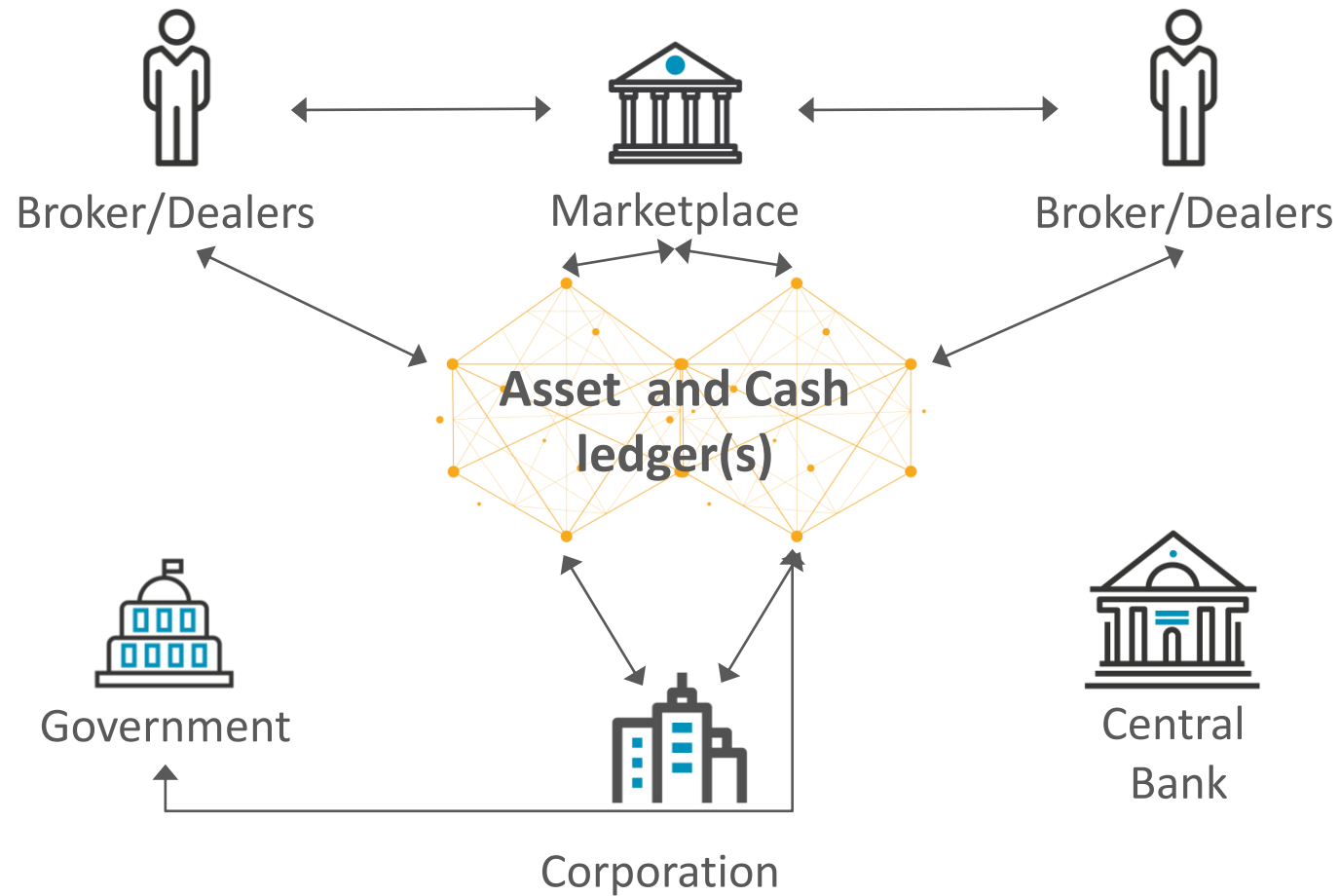
The background features a solid teal color with a faint, abstract network graphic. This graphic consists of numerous small, dark teal dots connected by thin, light teal lines, forming a complex, interconnected web that spans the width of the image. The lines and dots are more concentrated on the left and right sides, with the text area in the center being relatively clear.

Market Disruption through blockchain

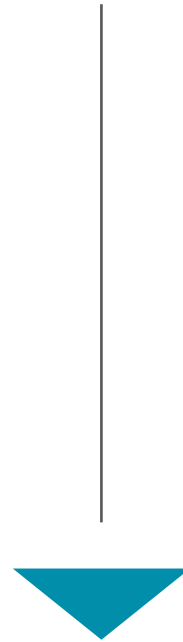
COMPLEX WEB OF THIRD PARTY INTERMEDIATION



CAPITAL MARKETS ON BLOCKCHAIN

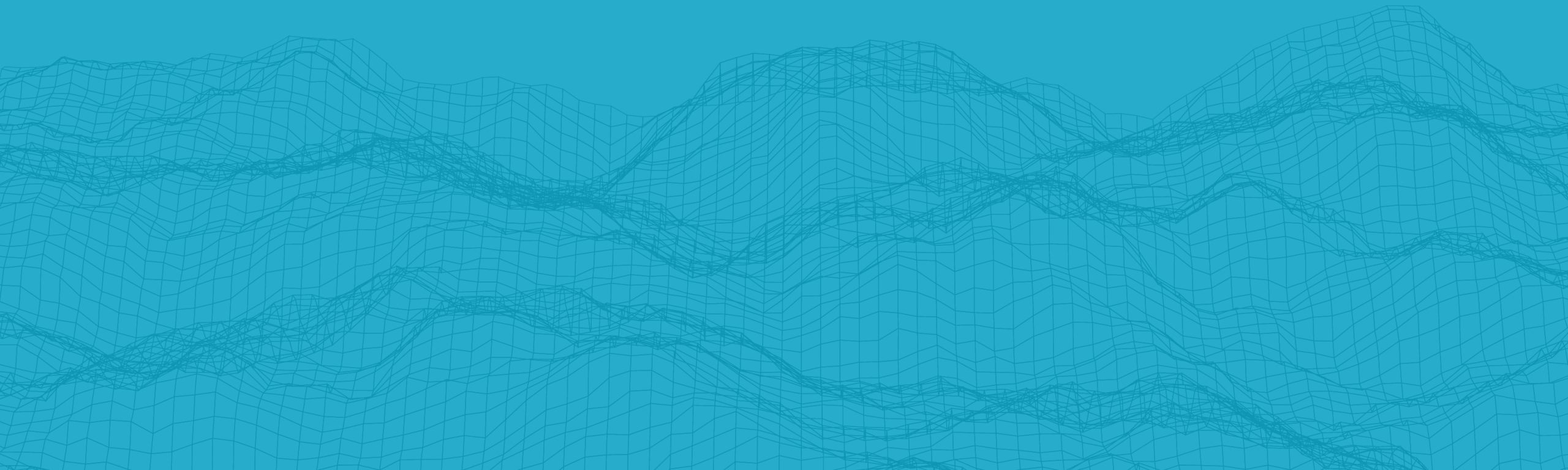


CHOOSE YOUR STRATEGY

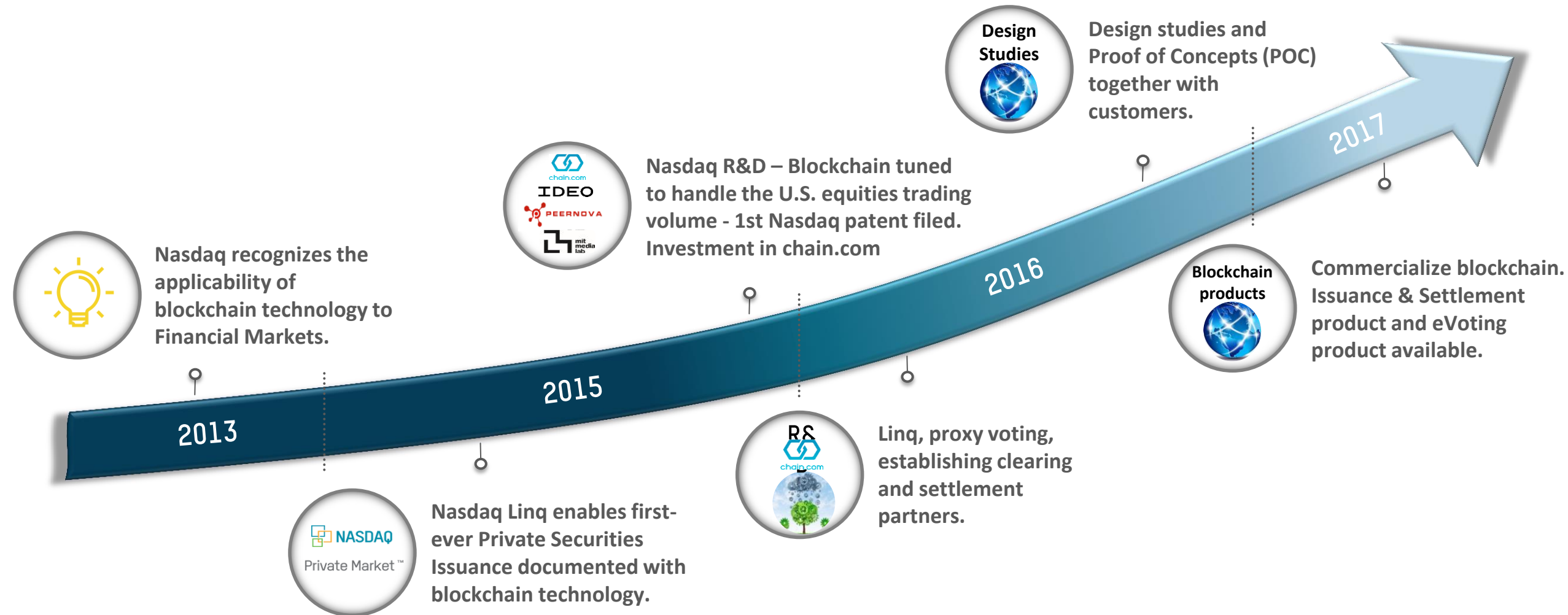


Nasdaq supports the building of sustainable blockchain businesses through strategies of either incremental innovation or disruption

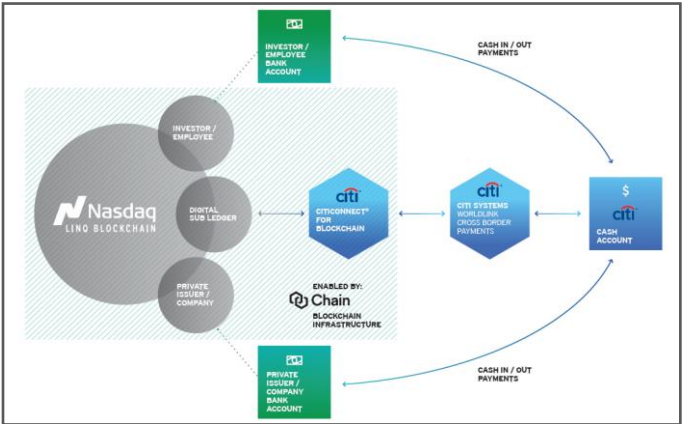
Nasdaq blockchain journey



NASDAQ'S BLOCKCHAIN JOURNEY



USE CASE OVERVIEW

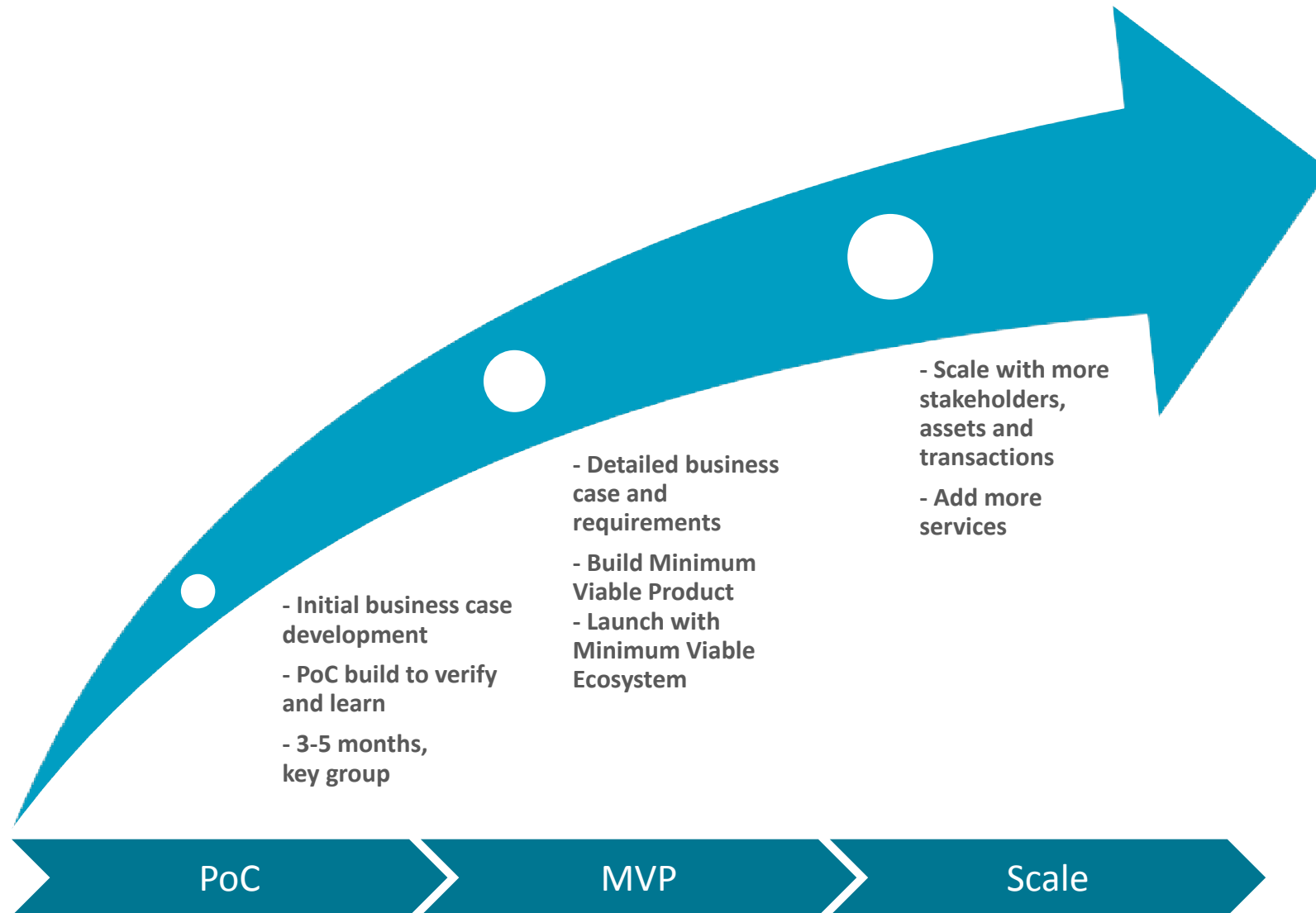


Nasdaq has a number of active blockchain initiatives both based on internal use cases and on cooperation with partners all with practical real-world applications.



Getting started with Nasdaq

NASDAQ APPROACH AND METHODOLOGY



SCALABLE PRODUCT OFFERING ON BLOCKCHAIN

NASDAQ ISSUANCE, TRADING AND SETTLEMENT SOLUTION ON BLOCKCHAIN

Platform Services

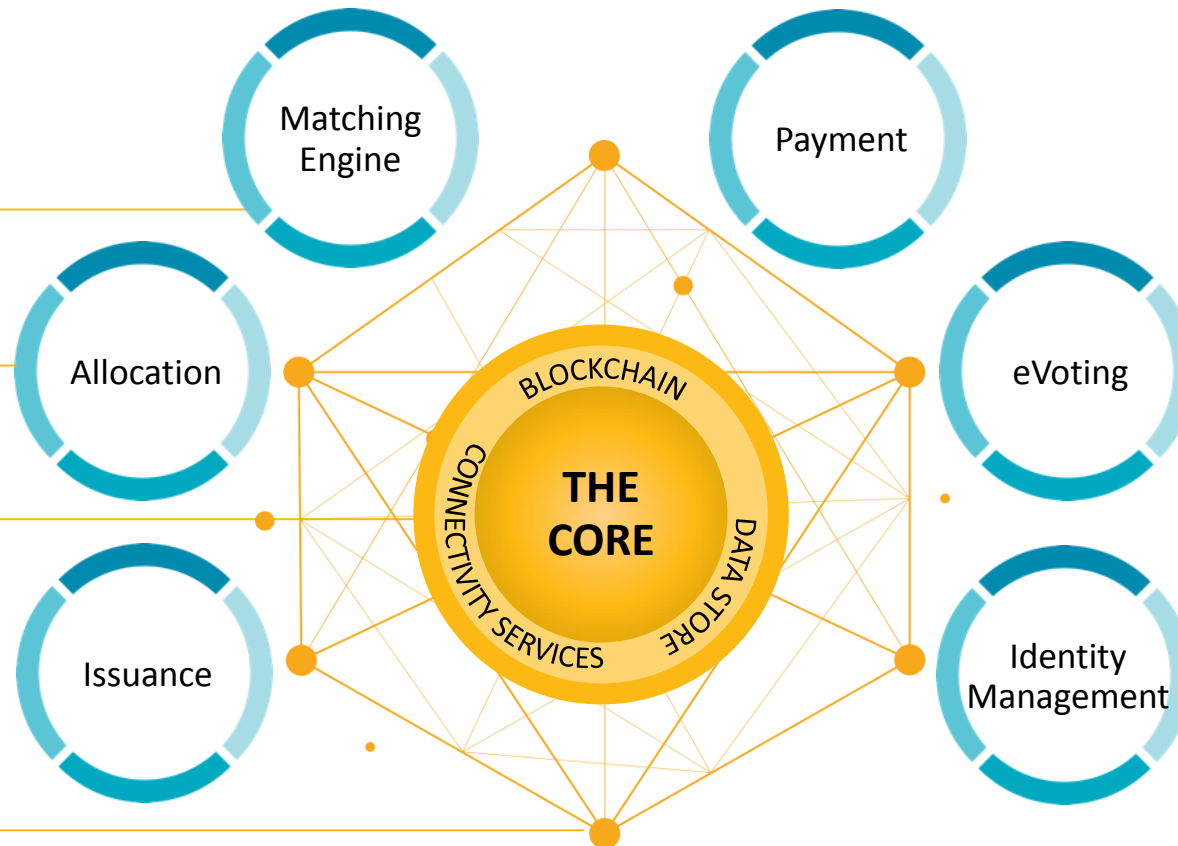
Reusable and scalable,
cloud-based micro services

Core Financial Framework

market capabilities, blockchain interoperability
and traditional data layer services

Blockchain Services

One service defining the DLT access,
agnostic to specific blockchain.
Preferred vendor Chain



- Blockchain-based issuance, trading and settlement system
- Packages the necessary functions for issuance, registrar, matching, transfer and settlement of securities and payments
- Solution can be fully hosted on-prem or in the cloud
- Built on the proven Nasdaq Financial Framework
- Easily scales from one to many network participants

THANK YOU

Johan Toll, Product Manager Blockchain, NASDAQ

johan.toll@nasdaq.com

www.nasdaq.com