DOUBLE CHAIN

Trend of Entity Authentication for Finance services

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DOUBLE CHAIN

Contents

Anti-money laundering

- **Know your customer** (**KYC**) is the process of a business identifying and verifying the identity of its clients.

- used to refer to the bank and anti-money laundering regulations which governs these activities.

- Know your customer processes are also employed by companies of all sizes for the purpose of ensuring their proposed agents, consultants, or distributors are anti-bribery compliant. Banks, insurers and export creditors are increasingly demanding that customers provide detailed anti-corruptiondue diligence information.

- **ISO 37001:2016**
  - Anti-bribery management systems – Requirements with guidance for use

Current Public-key Infrastructure

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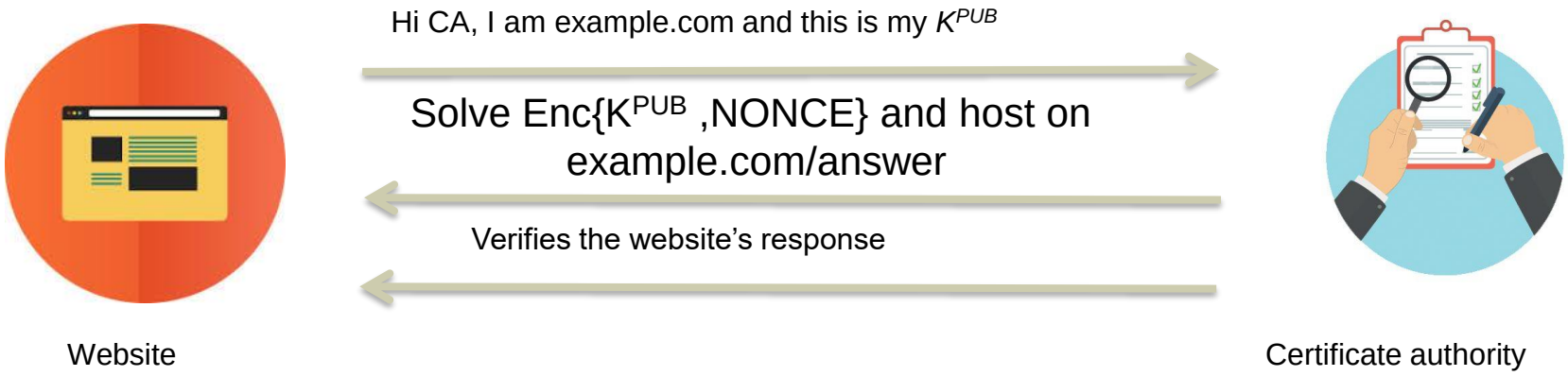
- Public keys are needed to authenticate the web-server in TLS (HTTPS)
- How do we know what is the public key of a server?
  - “Certificate Authorities” to the rescue
  - Browsers trust some CA intrinsically
  - CA in turn perform check and issue X.509 certs to domains
- Domain validation is completely automated and instantenous



Why the current PKI has a problem?

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- Reliance on a trusted CA can be a problem
  - Turn rogue
  - Can be hacked
  - Can make mistakes
  - Little transparency

- Breach of a single CA threatens the entire WWW
  - Any CA can issue certificate for any website in the world!

- Certificate transparency logs all public certificates on an immutable, append-only log
  - Kind of looks like a blockchain already

- But it's not distributed! Must trust Google or other CT log operators

Why Distributed ledgers(DLT) for PKI

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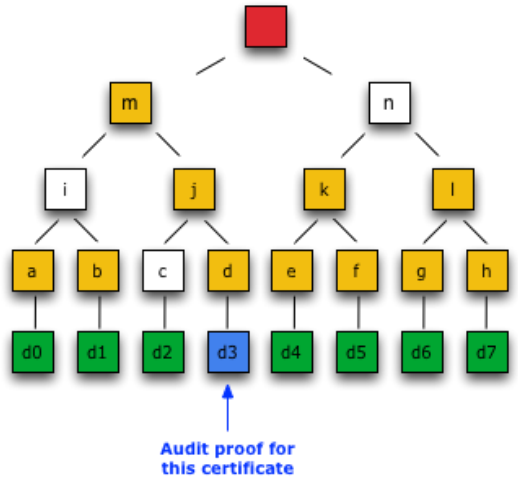
- PKI is simply a consensus on domain-name::public-key mapping
  - Mapping can be distributed
  - Perspective or PGP's web-of-trust
  - Domain-validation method is fully-automated and instantaneous
  - Distributed nodes might make MITM and BGP hijacks even harder
- Public ledgers of certificates are already maintained for transparency
  - Certificate transparency is now mandatory
  - CA must log the cert
  - Cryptographic proofs that cert exists in the log (Merkle Trees)
- Financial incentives exists and are probably necessary
  - Major domains pay substantial amount for extended validation
  - Free certificates have been found to be abused by Malware/Phishing domains



Let's Encrypt has issued 15,000 SSL certificates to PayPal phishing sites

Security experts call on firm to refuse certificates for domains containing popular brand names

Existing solutions

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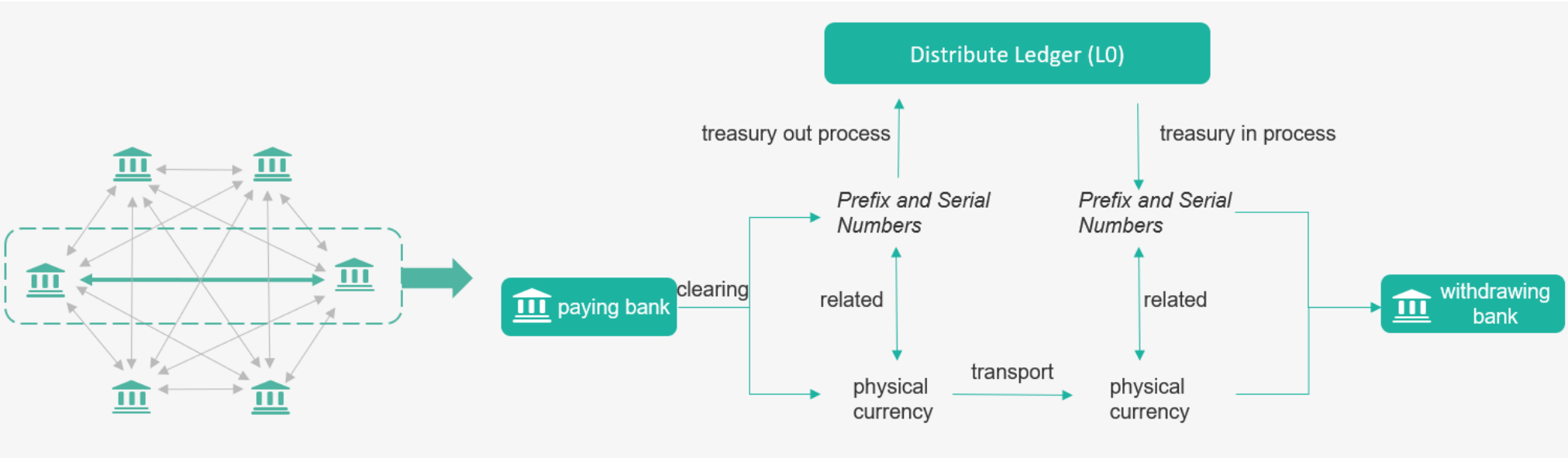
- Namecoin
  - One can register a new domain name on the blockchain with its public key
  - More like certificate transparency
  - If I register Symantec.com, how does Symantec get its name back?
- Instant-Karma PKI
  - A smart contract between domain and CA about financial liability
  - Financial incentives for miners to find abuse/mis-issuance
  - Supports the CA system, instead of replacing it
- Lot of open questions like validation, revocation etc. but this is an important use case
- X.509 is already an ITU standard!
  - ITU should think about a new standardized PKI? (currently under CA-Browser forum)
  - Standardization questions: Level of proof? Crypto? Consensus algorithm?

Cross-bank transfer system

- Minimalist Model



ITU-T Focus Group FG DFS (Digital Financial Services)

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- FG DFS - INTEROPERABILITY
  - Interoperability enables users worldwide to make electronic payment transactions with any other user in a convenient, affordable, fast, seamless and secure way – via a single transaction account.

- Regulations for Mobile Money
  - Mobile Money-Specific Guidelines and Regulations
  - Basic Characteristics of Regulations (Regulation, Law, Directive, Guidelines, Circular)
  - Operational Models: Bank-based vs Non-bank-based
  - Regulatory Safeguards, Agents

- Interoperability for Mobile Money
  - Types of Interoperability Regulations
  - Existing Interoperable Mobile Money Payment Schemes
  - Comparing Regulation and Market Types for Interoperable Mobile Money Schemes

ITU-T Focus Group FG DFC
(Digital Currency including Digital Fiat Currency)

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- Main Objectives
  - Study the economic benefit and impact of introducing DFC over mobile money;
  - Investigate the ecosystem of digital fiat currency implementation for financial inclusion;
  - Map the functional network reference architecture and process components required to implement digital fiat currency and integration with existing payment systems for interoperability;
  - Identify use cases, requirements and applications of digital fiat currency;
  - Develop better understanding of the security, regulatory implications, consumer protection, fraud prevention and counterfeiting issues of DFS and how can digital fiat currency can address these concerns;
  - Identify critical sovereign security, transparency and verifiability of DFC technology and provide guidelines towards the escrow of critical software and hardware components to ensure trust and verifiability; and
  - Identify new areas for standardization in ITU-T study groups.

ITU-T Focus Group FG DFC
(Digital Currency including Digital Fiat Currency)

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- Stakeholders
  - Central Banks
  - Telecom regulatory authorities
  - Financial service providers
  - Fintech Community
  - Payment Service Providers
  - Standard Setting Bodies
  - Academia

FIDO Alliance

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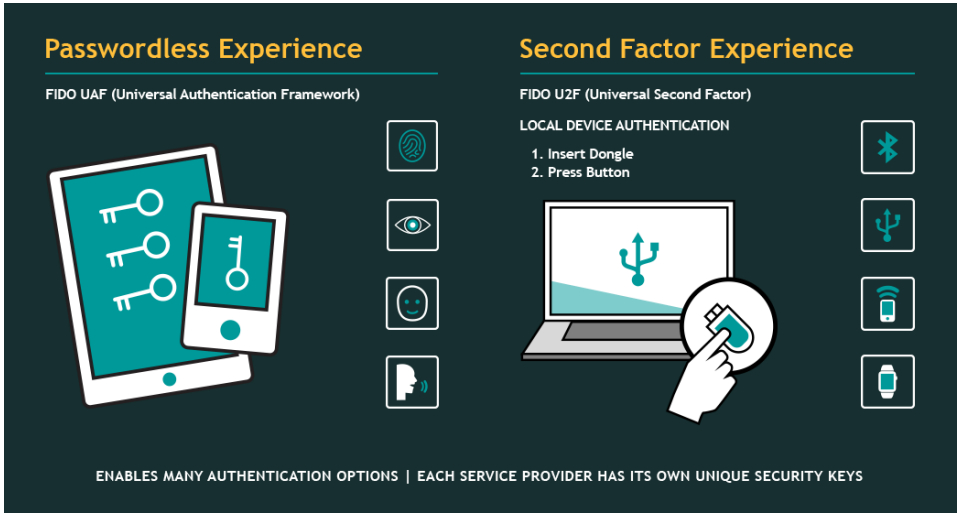
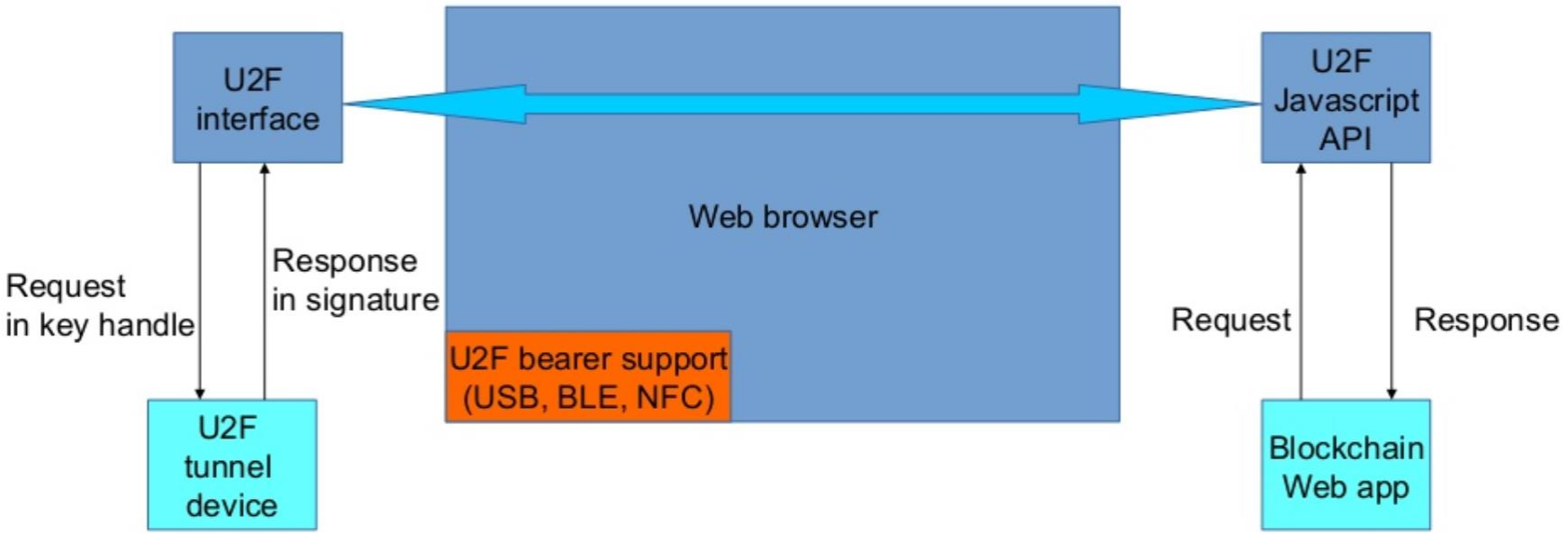
- Fido : Better identity, using strong cryptography
  - blockchain applications better trust, suing string cryptography
  - foundations of innovative privacy aware, user centric application relying on strong cryptography
  - Private keys are the corner stone of Blockchain application

- Asset ownership is linked to the ownership of private keys for all blockchains
  - Need for innovative solutions to create better backup schemes
  - Need to protect the user against malware



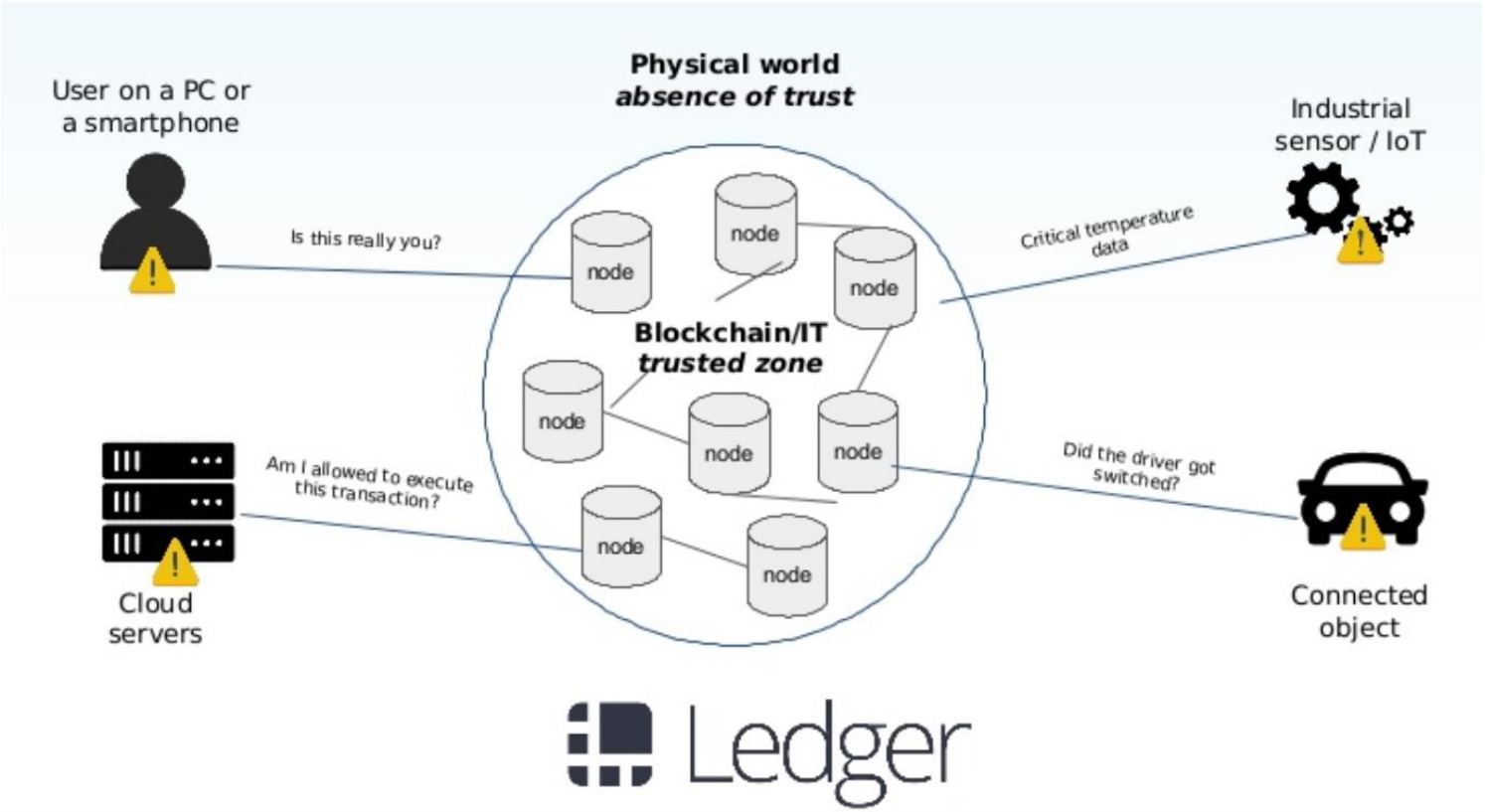
FIDO – Authentication

- U2F(Universal 2nd Factor Authentication)



FIDO with DLT

- Without trust, data has no actionable value



Combination of authentication method

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- Conventional method
  - KYC (Know Your Customer)
  - PKI (Public Key Infrastructure)
  - OTP (One Time Passwords)
  - Biometrics
- DLT(Distributed ledgers Technologies) + PKI
- FIDO(Bio) + Blockchain (DLT)
- PKI+ FIDO(Bio) + Blockchain (DLT)


Thank you