



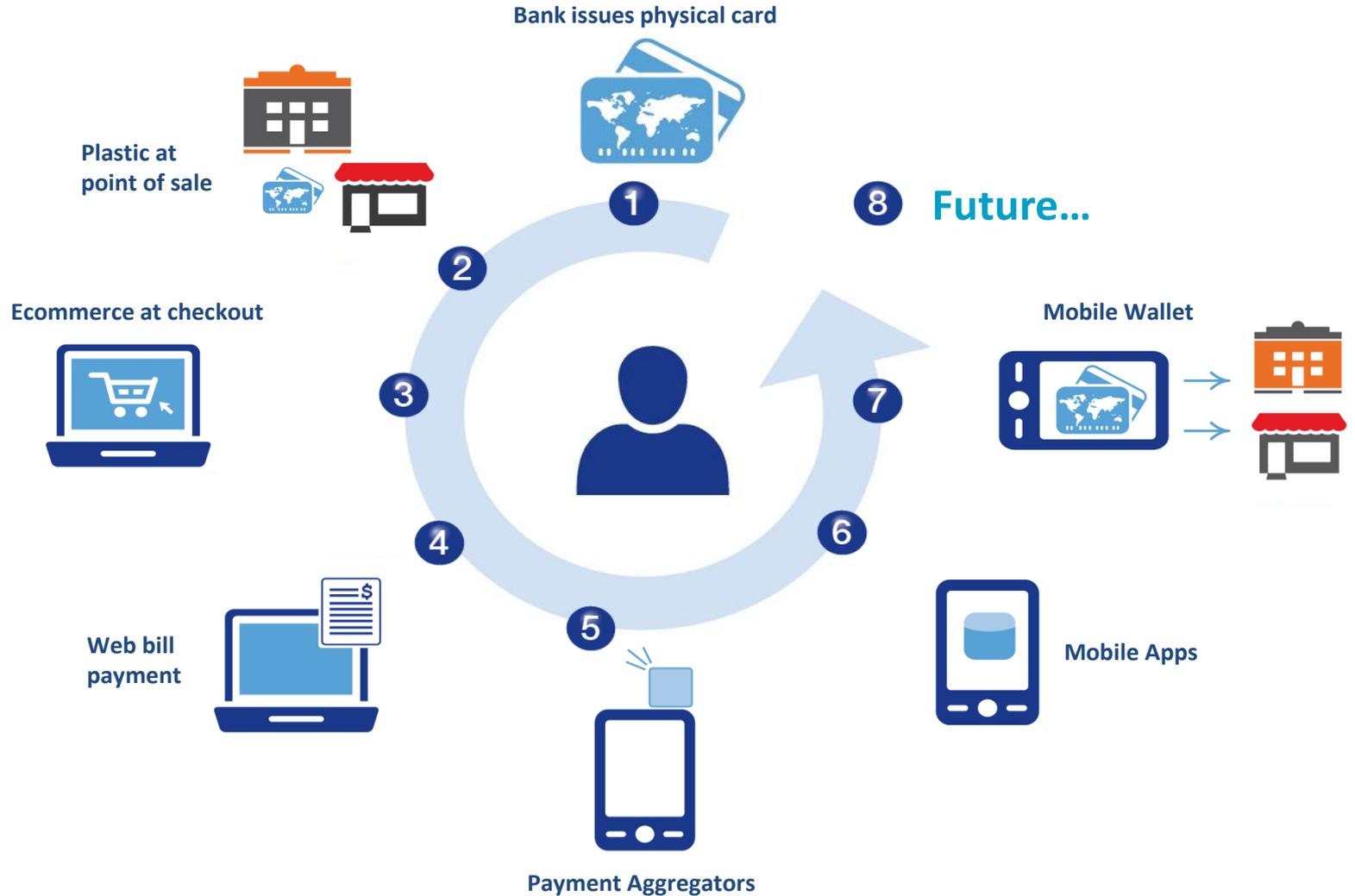
Enabling Trusted Interoperability Tokenization Overview

Dave Fortney, The Clearing House
dave.fortney@theclearinghouse.org

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PROBLEM STATEMENT: PROLIFERATION OF LIVE CONSUMER PAYMENT CREDENTIALS



TOKENIZATION

Tokenization can reduce or even eliminate proliferation of live customer credentials

Typical Attributes of Payments Tokens

- Format-preserving for legacy compatibility
- Either “dynamic” or “static”; if static, may be combined with a cryptogram
- Restricted in scope / not “general purpose”
- Can be used live to authorize / clear transactions or after-the-fact to sanitize data stores

Relationship to other technologies

- EMV: *Protects against card counterfeiting*
- Point-to-point encryption: *Protects data in-flight (e.g., against RAM-sniffing software)*
- Tokenization: *Eliminates use of static account numbers*

Tokenization

Substitutes a limited-use random number (secure digital token) for customer’s account numbers so that the sensitive information remains safe.

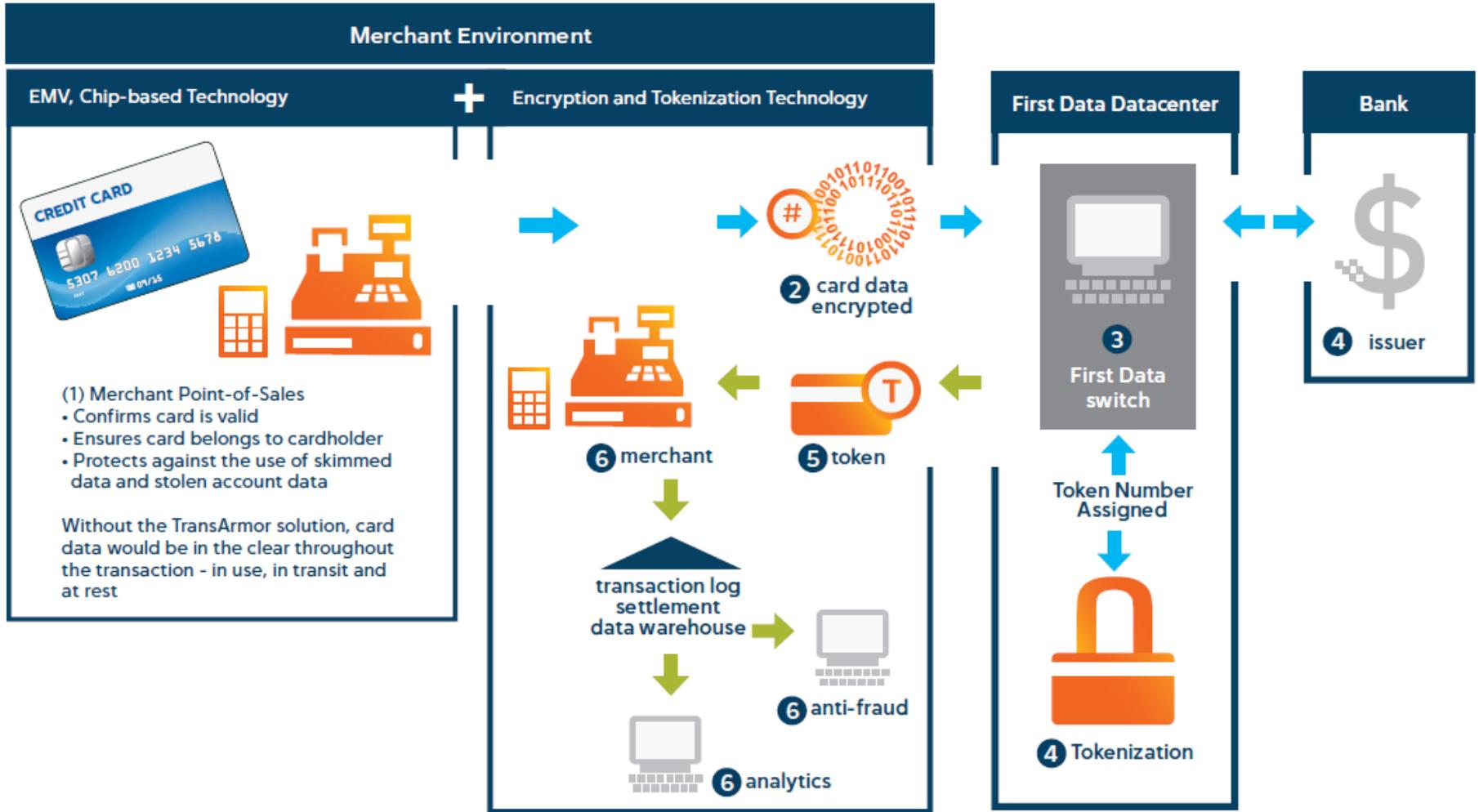
Even if compromised, the token is of limited or no use to cybercriminals

Token Vaults

Bank (or multi-bank) vaults create tokens, perform customer authentication and provision tokens to digital wallets or directories

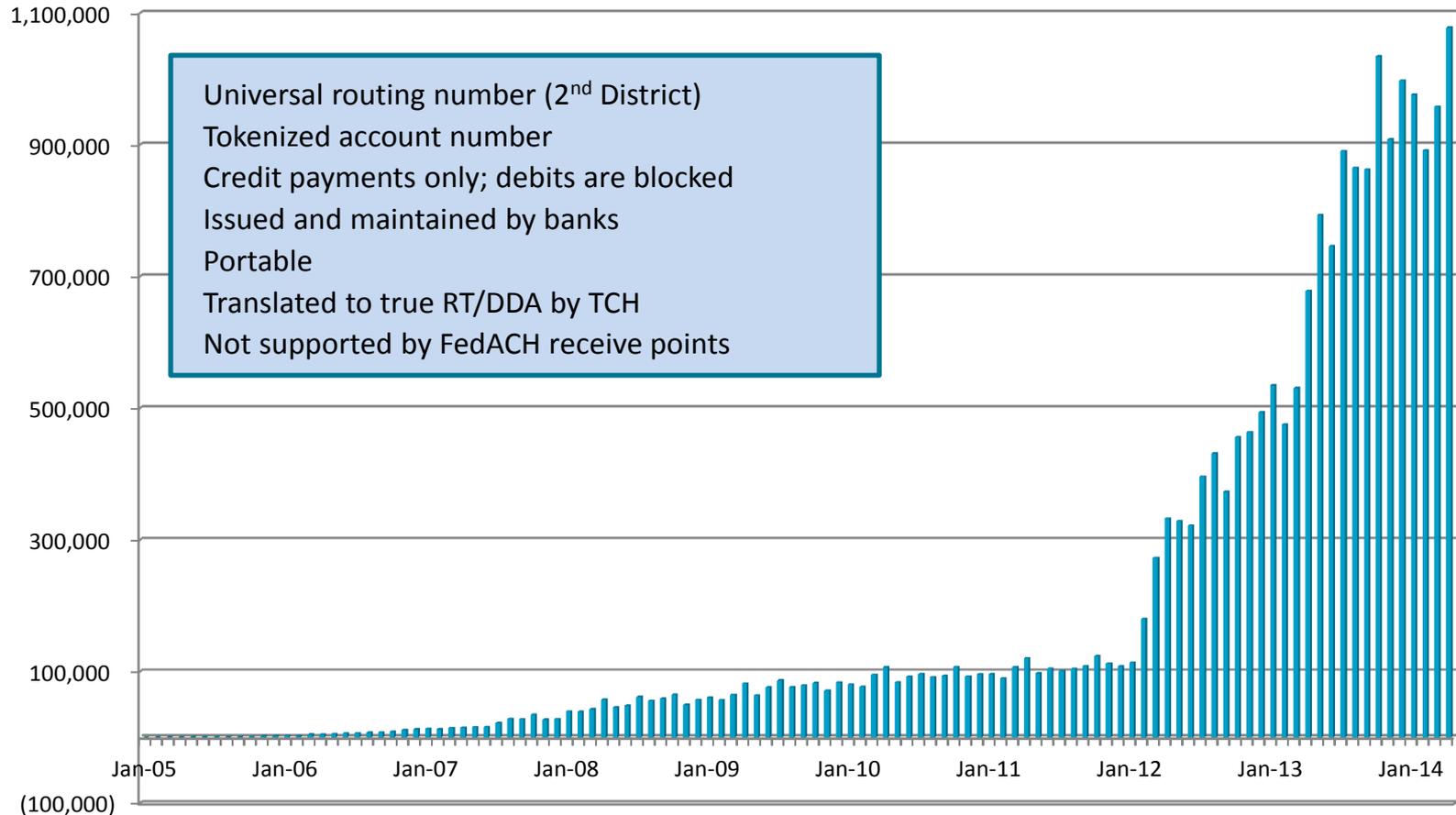


EXAMPLE #1: FIRST DATA TRANSARMOR (WITH ENCRYPTION)



Source: EMV and Encryption + Tokenization: A Layered Approach to Security, First Data, 2012

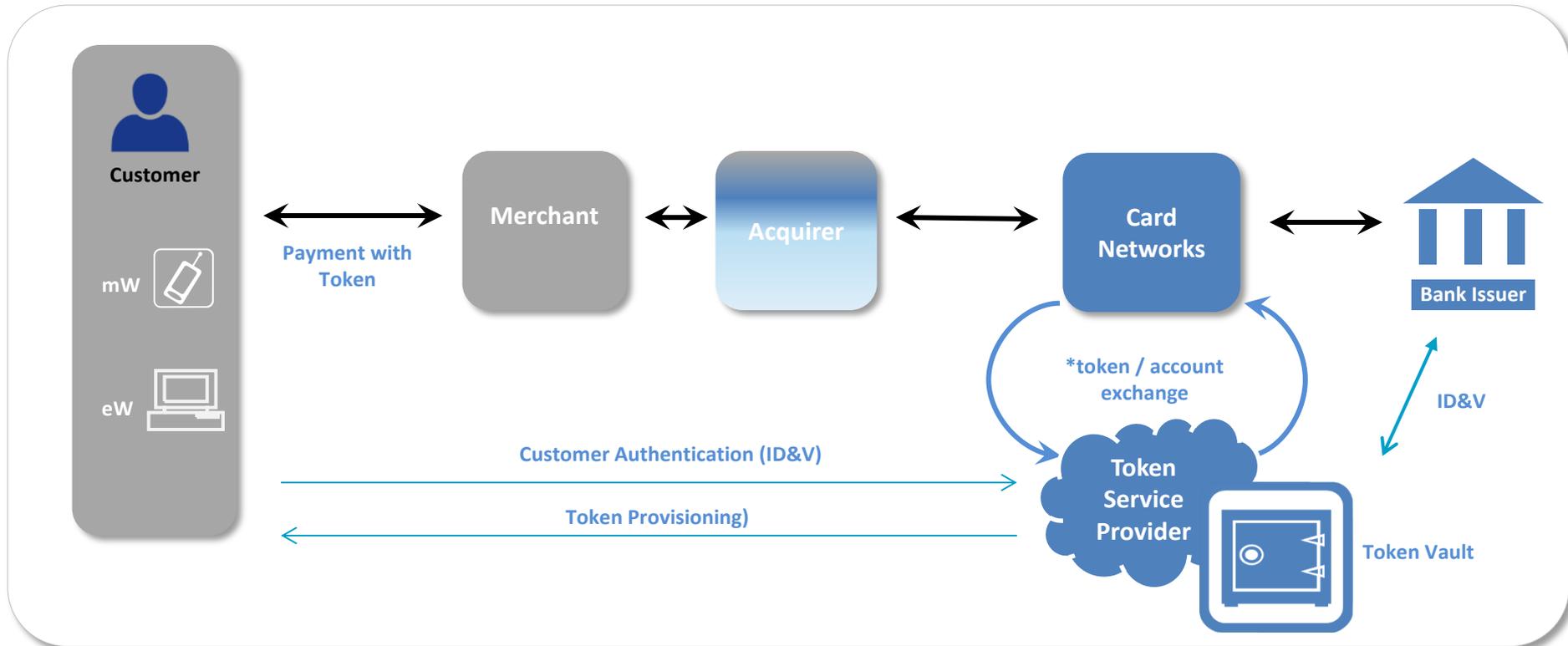
EXAMPLE #2: TCH'S UPIC — ACH TOKENS FOR B2B CREDITS



Ubiquitous DDA tokenization is a prerequisite for safe and secure faster payments

EXAMPLE #3: CARD TOKENIZATION FOR MOBILE AND E-COMMERCE

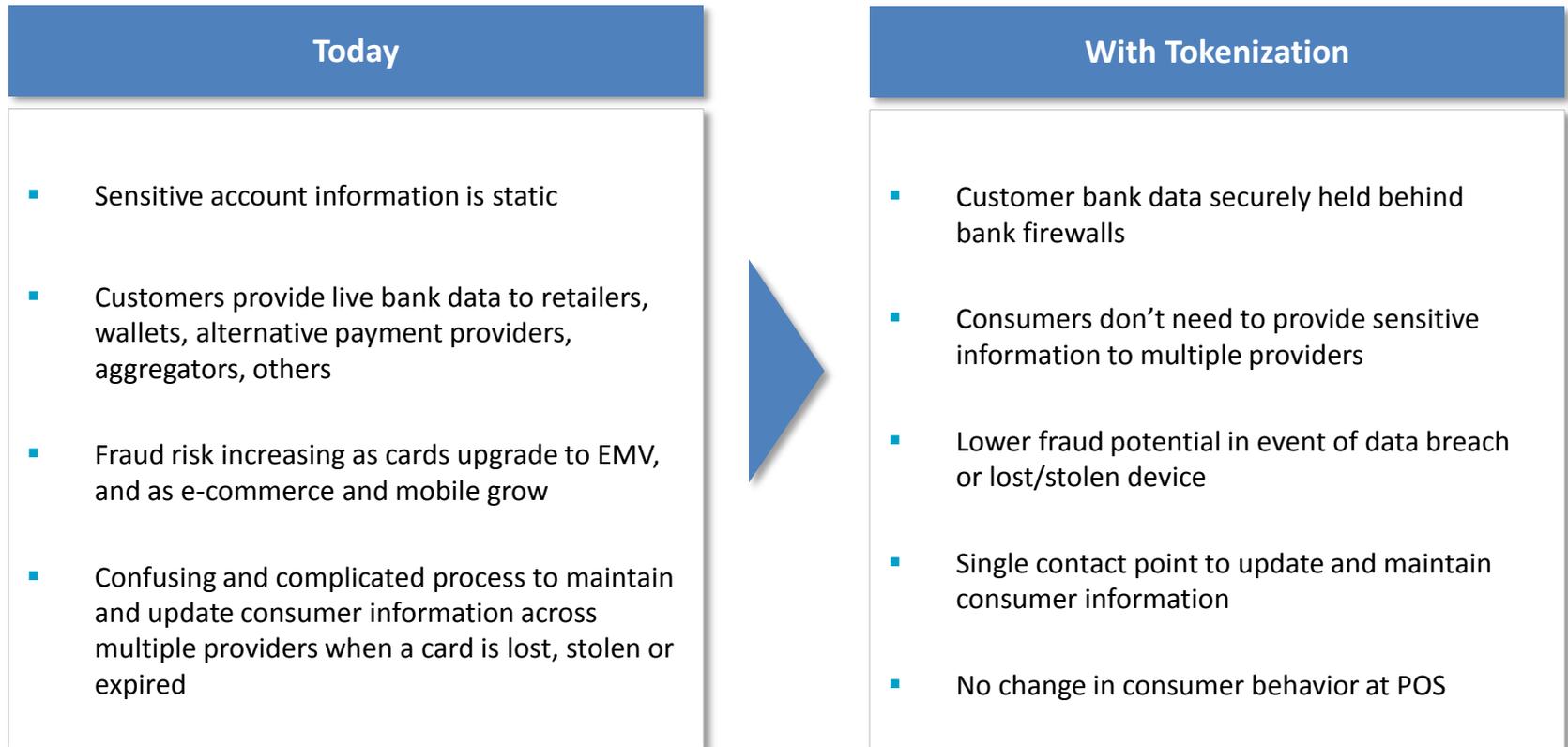
Example: EMVCo Tokenization and TCH's Secure Token Exchange



- No access to customer bank account information
- Access to customer bank account information

- Acquirers route tokens to credit and debit networks, just as they do today with PANs
- Token Service Provider / Vault could reside at bank, at card network, or at other party such as TCH

SOLUTION: SECURE TOKENIZATION PROVIDES BENEFITS TO ALL STAKEHOLDERS, INCLUDING CONSUMERS



U.S. has opportunity to lead the world by rolling out tokenization in conjunction with EMV to protect against card present and card not present fraud

ACHIEVING TOKENIZATION INTEROPERABILITY AND UBIQUITY

Six Safety and Soundness Principles

- 1. OPEN:**
 - Allows for different business models
 - Fosters innovation
 - Ensures competition among market participants (e.g., vaulting)
- 2. SAFE & SECURE:**
 - Protects confidential personal, financial, and transactional information within the mobile and e-commerce payments ecosystem
 - Facilitates secure interactions
- 3. RESPONSIVE TO END USER AND MERCHANT NEEDS:**
 - Provides for ease of use, speed, availability, security, transparency, choice and consistency for users
- 4. STANDARDS-BASED:**
 - Establishes clearly defined standards
 - Aligns with regulatory environment and avoids overlap with existing standards
 - Considers and respects int'l standards as a means of facilitating interoperability
- 5. SUSTAINABLE:**
 - Creates a path forward to support long-term viability
 - Adapts over time as technology evolves
 - Allows for economically viable business models that accelerate adoption
- 6. INITIAL FOCUS ON HIGH-RISK USE CASES:**
 - Mobile and e-Commerce
 - Supports exception flows, lifecycle management
 - Supports multiple form factors (e.g., NFC, QR codes)

TOKENIZATION FOR DDA-BASED PAYMENTS AND DIRECTORIES

- DDA Tokenization could mitigate ACH/Check fraud and encourage wider use of DDA payments by consumers
 - Critical as card payments become better secured with EMV, tokenization and encryption
- DDA Tokens are also an enabler for DDA directory services
 - Directory lookups translate known identifiers into information sufficient to route payments
 - Example Directories: P2P, EBIDS/Bill payment, Healthcare payments, B2B
- An enabler for future account number portability

“Financial institutions have always been the stewards of safe and sound payment systems. As an industry, we want to do what we can to ensure that privacy and fraud protection are built into all types of digital payments.”

Richard K. Davis
Chairman, President, CEO
U.S. Bancorp
Chairman, The Clearing House



Tokenization is an important building block for protecting digital payment streams from cyberattack and enabling trusted interoperability