



Mobile and Digital Wallet Webinar Series

Part 1: Landscape, Models & Process

January 9, 2019

U.S. Payments Forum Mission

- *... the cross-industry body focused on supporting the **introduction and implementation of EMV and other new and emerging technologies** that protect the security of, and enhance opportunities for payment transactions within the U.S.*

Current EMV-related Topics and Issues

- Petro, Transit and Hospitality merchants EMV-enablement issues
- EMV contactless/mobile acceptance testing & certification
- Issuer considerations for contactless EMV (dual interface, offline data authentication)

Beyond EMV – Advanced Payments Topics and Issues

- Mobile payment and tokenization
- Authentication: biometrics, future of CVM, new signature requirements
- 3-D Secure 2.0, Secure Remote Commerce and other CNP fraud tools

Forum Activities & Resources

- **Collaboration on projects to develop resources to assist with U.S. EMV migration and implementation of other new and emerging payments technologies**
 - White papers, educational resources
 - Best practices and technical recommendations
- **Education programs for members and the industry**
 - Webinars, workshops, Forum member meeting tutorials, published resources
- **Communications**
 - Market outreach with recommended best practices and industry positions
- **Networking**
 - Forum for industry stakeholders to interact with all payments industry stakeholders

Information and resources available at www.uspaymentsforum.org

Mobile & Digital Wallet Webinar Series

- **#1 – Mobile Wallet Landscape, Wallet Models and Processes – Jan. 9th**
Review of five commercially-available wallet models with technologies and processes used in their implementation
- **#2 – Mobile Wallet Security Technologies and Approaches – Jan. 23rd**
Review of different security technologies implemented in wallets
- **#3 – Strategic Considerations for Merchants – Feb. 6th**
Review of key strategic considerations for merchants implementing a mobile wallet strategy
- **#4 – Strategic Considerations for Financial Institutions – Feb. 20th**
Review key strategic considerations for financial institutions implementing mobile wallets

Today's Speakers



- Randy Vanderhoof, U.S. Payments Forum



- Deborah Baxley, PayGility Advisors



- Mina Malak, G+D Mobile Security



Mobile and Digital Wallet Landscape, Models & Processes

Deborah Baxley, Partner, PayGility Advisors

Mina Malak, Sr. Product Manager, G+D Mobile Security

Polling question: Which of the following mobile or digital wallets have you used?

1. Apple / Google / Samsung Pay
2. Chase Pay
3. Starbucks
4. Visa Checkout / Masterpass / Amex Express Checkout
5. Walmart Pay



Digital or mobile wallets enable transactions to be initiated by a mobile device at a POS, online, or in-app, using one of 5 models

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout



The wallet models vary mainly by device dependency vs cloud-based, whether proprietary or open, and how proximity works – contactless vs. QR code

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout

- Operating system specific
- Tokenized payment credentials stored in mobile device or cloud
- Provisioned by card issuer
- Open: accepts any eligible type of card from participating issuer, usable at any contactless merchant



The wallet models vary mainly by device dependency vs cloud-based, whether proprietary or open, and how proximity works – contactless vs. QR code

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout

- All of the above, plus:
- Works for participating merchant mobile apps/browsers with a “Pay” button

The wallet models vary mainly by device dependency vs cloud-based, whether proprietary or open, and how proximity works – contactless vs. QR code

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout

- Cloud-based and device agnostic
- Use QR codes to complete purchase at POS, authorize fuel pumps
- Typically usable only at specific merchant

The wallet models vary mainly by device dependency vs cloud-based, whether proprietary or open, and how proximity works – contactless vs. QR code

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout

- Payment credentials stored by merchant or Payment Service Provider for repeated or automatic payments without re-entering credentials
- Requires consumer enrolling a payment method, account creation
- Optional tokenization
- Usable by single or multiple merchants
- Device agnostic and open to any type of card, usable at any participating merchant

The wallet models vary mainly by device dependency vs cloud-based, whether proprietary or open, and how proximity works – contactless vs. QR code

Mobile/Digital Wallet Models

Device-Centric
Mobile Proximity

Device-Centric
Mobile In-App

QR Code

Card-Not-Present
Card-on-File

Digital Checkout

- Enables online purchases without entering payment credentials (or sometimes shipping address)
- Offered by payment networks to both FIs and merchants, often within their app
- Tokenized payment credentials (optional)

Providers determine what wallet model they support based on the technology they're implementing and solution they want to enable

Wallet Design Choices

- **Interaction method for proximity payments:**
 - Contactless **NFC**
 - **QR code**
 - **Magnetic Secure Transmission (MST)**
- **Storage of payment credentials:**
 - Credential related to NFC-enabled mobile device:
 - Handset secure element (**SE**)
 - Host Card Emulation (**HCE**)/cloud
 - Payment credential not tied to the mobile device: **Card-on-File**
- **Payment options:**
 - **Proximity** in-store
 - **In-app**
 - Remote **e-commerce** or **m-commerce** (web browser)
- **Acceptance mode:**
 - Card/**device-present**
 - **Card-Not-Present**
- **Payment credential use:**
 - **Staged**
 - **Pass-through**
- **PAN vs. Token**





Polling question: What do you find the “coolest,” most compelling thing about using a mobile or digital wallet?

1. Impress the cashier
2. Pay with wristwatch, very convenient
3. Payment “disappears” as with Uber
4. Easier checkout especially for mobile
5. Automatically stores loyalty/coupons



Each model has powerful established and FinTech players experimenting with implementations in a effort to gain adoption

Digital Model Examples

Model	Examples	Results
Device-Centric		<ul style="list-style-type: none"> • Potential for wake on lock screen, biometrics • Apple ties up access to NFC, Samsung offers MST • Limited to certain handset models
Bank-Centric		<ul style="list-style-type: none"> • Enriched payment data • Limited to that bank's cards
Network-Centric		<ul style="list-style-type: none"> • Frictionless payment • Platform for IoT, bank-branded
Merchant-Centric		<ul style="list-style-type: none"> • Loyalty, convenience, offers • Value add; e.g., order ahead, scan & go
MNO-Centric		<ul style="list-style-type: none"> • Consortium, business model challenges • HCE and SE technology emergence
In-App/ COF/eCommerce		<ul style="list-style-type: none"> • Wide variety of features; e.g., delivery, financing
Alternative Rails		<ul style="list-style-type: none"> • Instant payments • Includes Bitcoin & digital currency wallets
P2P		<ul style="list-style-type: none"> • Combined with social networks

Main focal points driving the consumer adoption and lifting the usage of the mobile/digital wallet include loyalty, new payment types and improved experience






Drivers for Consumer Adoption of Mobile/Digital Wallets

- **Incorporating loyalty functions**
 - Storing and using loyalty cards
 - Presenting offers, deals, discounts, and rewards
- **Offering new types of payments**
 - Transit fares
 - Scan and go, eliminating checkout
 - In-app and person-to-person
- **Enhancing the shopping experience**
 - Advance ordering
 - Delivery
 - First access to sales
- **Personalized recommendations based on customer preferences and history**

We can learn some lessons from the experiences of some wallet providers

Mobile/Digital Wallet Adoption Lessons Learned

Adoption ↑

Example	Result
	<ul style="list-style-type: none">▪ Highest adoption of any US wallet @ 30% of transactions
	<ul style="list-style-type: none">▪ Major percentage of US mobile contactless transactions
	<ul style="list-style-type: none">▪ 14 cities, 14,000 stores, >1.5m users
	<ul style="list-style-type: none">▪ Plagued by delays and bad publicity, shut down after 4 years▪ Technology acquired by JPMC
	<ul style="list-style-type: none">▪ Shut down after 2 years, assets acquired by Google

What worked ?

- Consumer experience and ease-of-use
- Providing incentives, like loyalty and offers, to drive consumer adoption
- Making payments invisible
- Reassurance of strong security
- Collaboration with industry stakeholders vs. circumventing some interests
- Avoiding POS changes and additional fees

What didn't work ?

- A model focused on driving down merchant's cost of payment acceptance
- Requiring merchants to change POS hardware or software
- Not collaborating with ecosystem players (merchants, banks, MNOs, etc.)
- Designing by committee/consortium
- Attempting to monetize data or charge additional fees

Polling question: What makes these wallets to be as secure as chip card payments?

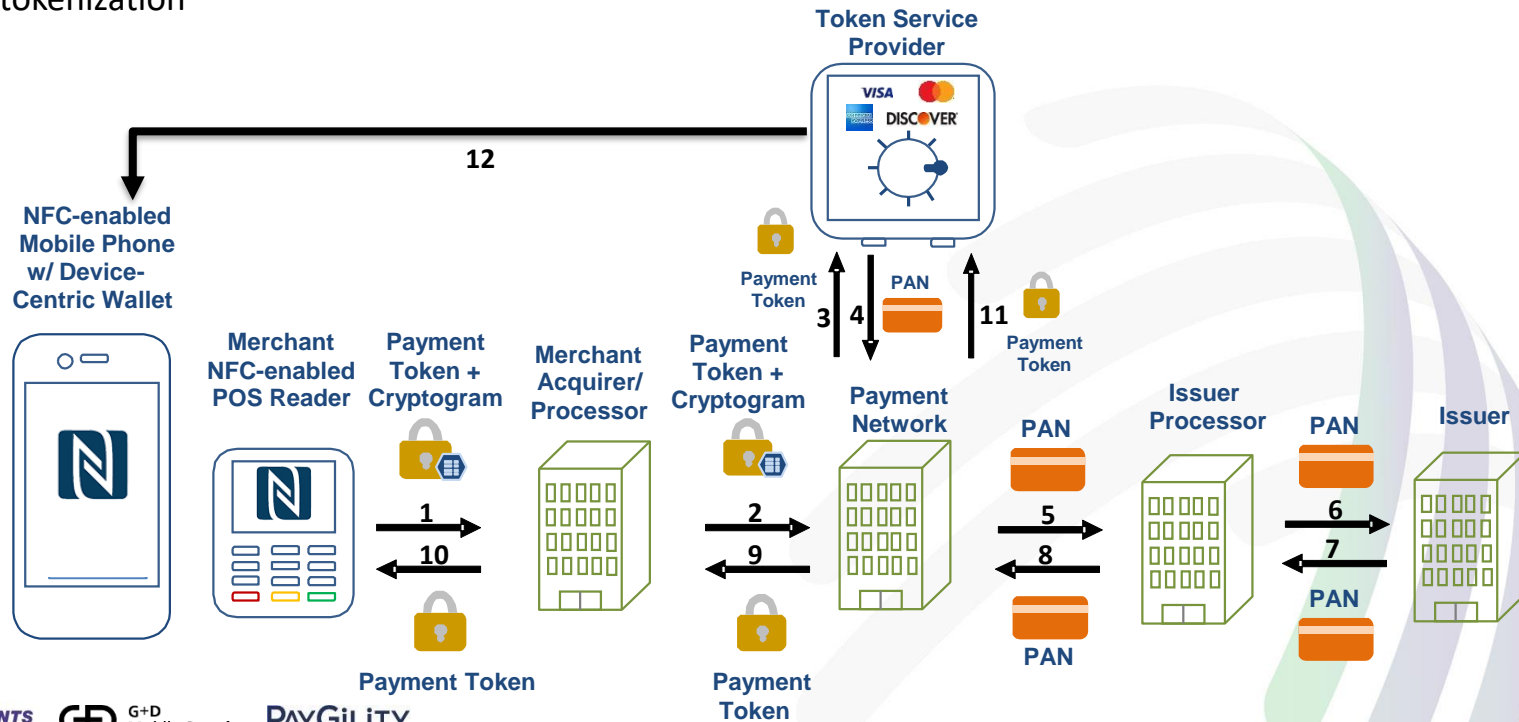
1. Tokenized payment credentials
2. Encryption
3. Biometric authentication
4. Bank identity verification processes
5. All of the above



The “Pays” use a common transaction flow using NFC and EMV payment tokenization

Device-Centric POS Transaction Flow

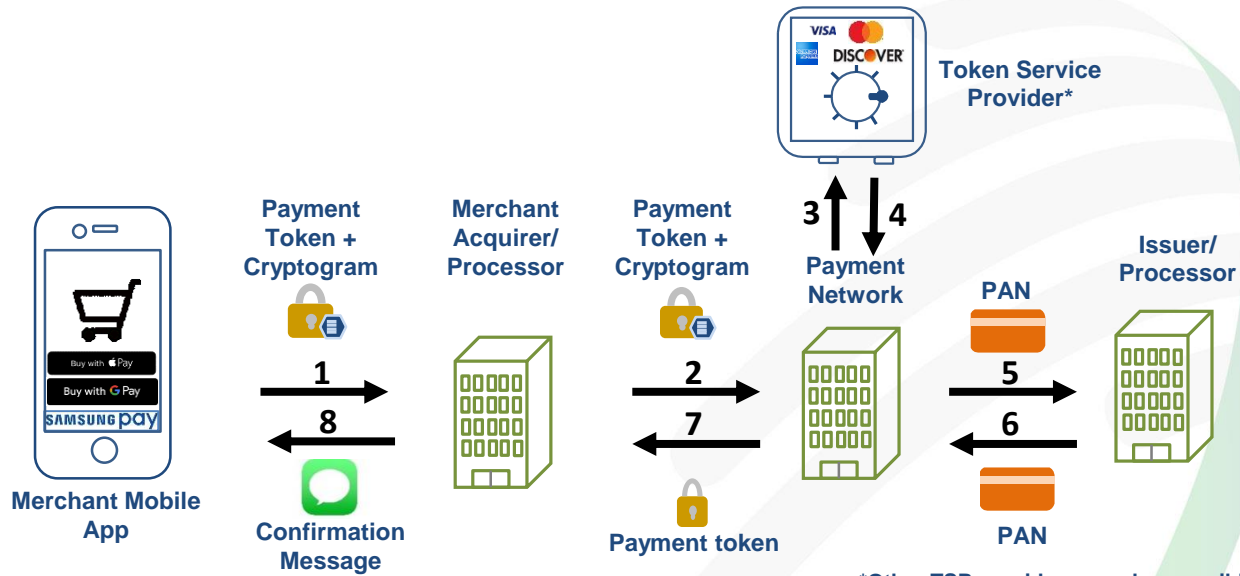
- This transaction flow is used by Apple Pay, Google Pay, or Samsung Pay with contactless and payment tokenization



The “Pays” use a common transaction flow for in-app transactions

In-App Device-Centric Wallet Transaction Flow with Tokenization on Merchant App

- Customer authorizes payment in merchant mobile application with a biometric, PIN or passcode
- Tokenized payment credentials and cryptogram are sent to the merchant app
- Customer’s billing information may also be passed to the merchant app

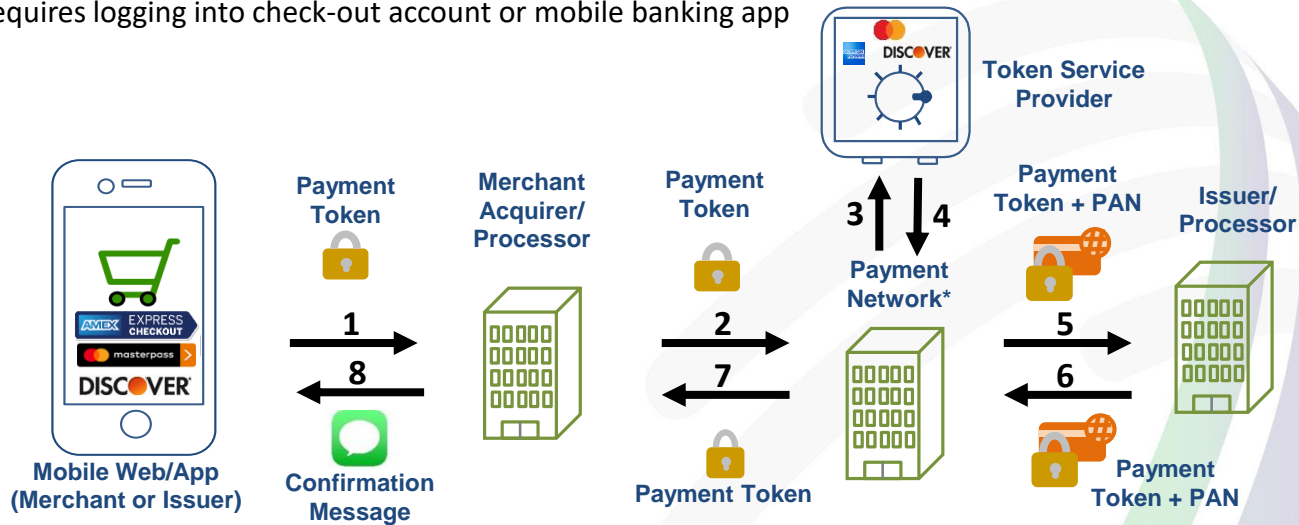


*Other TSP providers are also possible

Payment-network-centric cloud-based wallets simplifies buying experience for customers

Payment-Network Centric Cloud-Based Digital Checkout Wallets

- Mastercard/American Express work directly or with Financial Institutions to tokenize cards in cloud wallet
- In some cases, card from any brand can be added to cloud wallet (Brand agnostic)*
- Common enrollment options:
 - Financial Institution mobile application or online banking
 - Cloud wallets provider-hosted site
 - As part of 1st purchase
- Transaction requires logging into check-out account or mobile banking app

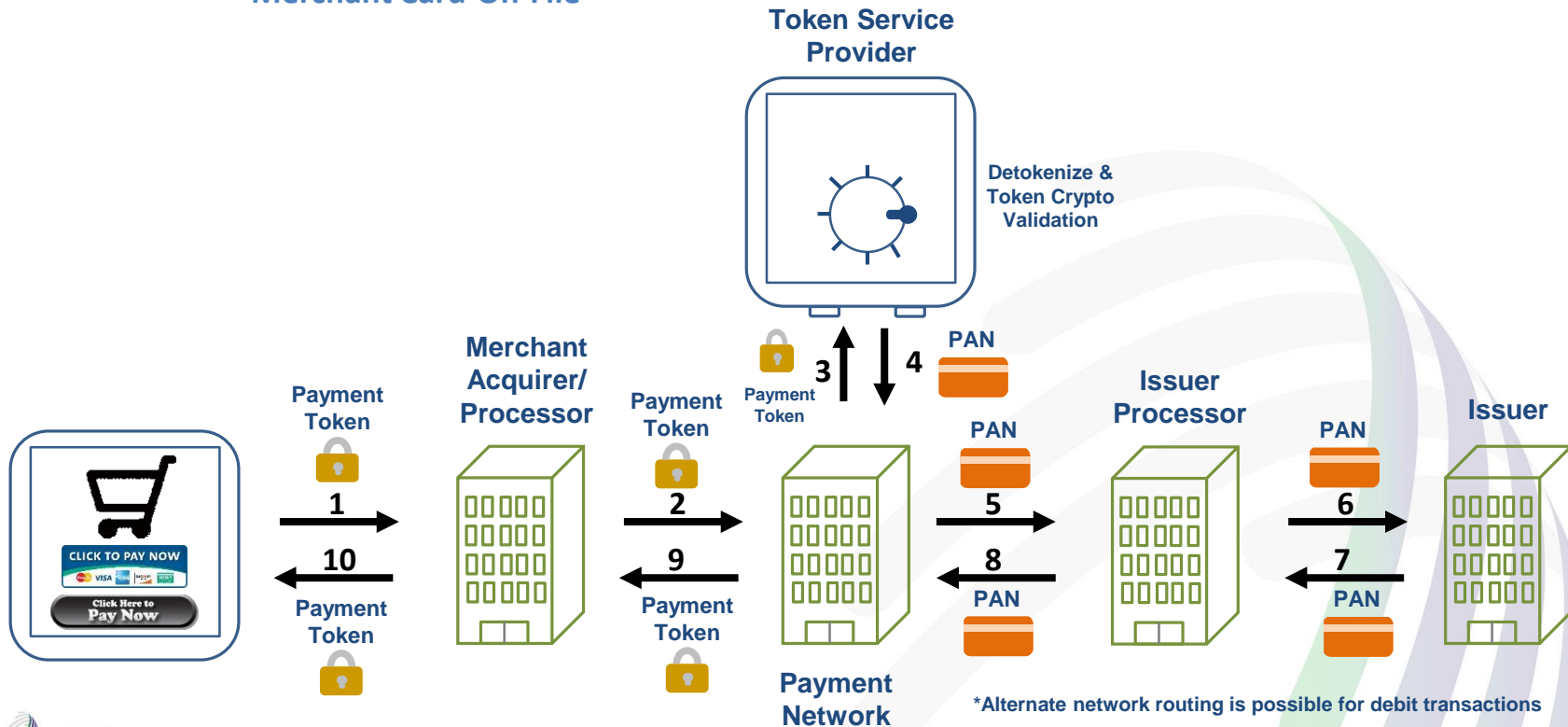


Payment network for in app refers to token requested corresponding to the card brand
Visa not depicted since Visa CheckOut is not a cloud based wallet.

* In that case would not be tokenized

Merchants use Card-On-File solutions to ease commerce – these solutions can optionally be secured using tokenization

Merchant Card-On-File



A QR code encodes a card number into a two-dimensional bar code that can be scanned and decoded quickly

Cloud-Based QR Code Wallets

- Considered as easy implementation since NFC not required, standard merchant scanners used, works on any phone, any payment type
- Consumer-presented QR code:
 - Consumer scans at POS reader
 - QR code previously downloaded and stored in mobile wallet
 - App-generated one-time dynamic QR code
 - Optional encrypt and/or tokenized credential
 - Optional automatic enrollment by FI (no new login credentials)
 - Optional pay with points
 - May work in-store, in mobile app, online, at fuel pump
- Merchant-presented QR code:
 - Consumer scans QR code generated by POS with mobile phone camera
 - Mobile app uses merchant info to initiate payment
 - Payment credentials not stored in phone or merchant terminal

Q&A



www.uspaymentsforum.org



Mobile Wallet Webinar Series: Online Assessment

- Online assessment quiz available for each webinar in the series
- Participate in all four webinars and assessments to receive a certificate and registration discount to the 2019 Payments Summit
- Assessment link:
<https://www.surveymonkey.com/r/walletwebinar1>

Additional Resources

- **March U.S. Payments Forum Member Meeting and 2019 Payments Summit**, Mar. 11-14, Phoenix, AZ
 - **Mar. 11-13 – Forum Member Meeting:** roundtables, SIGs, working committee and birds-of-a-feather sessions
 - **Mar. 12-14 – 2019 Payments Summit:** multiple tracks covering all things payments, including FinTech, EMV chip technology, mobile wallets, NFC, contactless, open transit systems and more
- **Mobile and Digital Wallets: U.S. Landscape and Strategic Considerations for Merchants and Financial Institutions** white paper, <http://www.uspaymentsforum.org/mobile-and-digital-wallets-u-s-landscape-and-strategic-considerations-for-merchants-and-financial-institutions/>
- Other resources available at: www.uspaymentsforum.org

Randy Vanderhoof, rvanderhoof@uspaymentsforum.org

Mina Malak, mina.malak@gi-de.com

Deborah Baxley, Dbaxley@PayGility.com



www.uspaymentsforum.org



G+D
Mobile Security

