The Evolution of Payment Specifications and Tokenization

Smart Card Alliance and EMVCo Webinar
October 1, 2015
Presenters and Agenda

- **U.S. Market Progress**
  - Randy Vanderhoof
  - Executive Director
  - Smart Card Alliance & EMV Migration Forum

- **EMVCo: Mission, Structure, Activities and Industry Engagement**
  - Brian Byrne
  - Director of Operations
  - EMVCo
Progress for the U.S. Market in Adopting EMV Chip Payments, Contactless Mobile Payments and Payment Tokenization

Randy Vanderhoof
Executive Director
Role of Payments Industry Associations

• “to address issues that require broad cooperation and coordination ...... to ensure the successful adoption of EMV-enabled cards, devices, and terminals ...... to ensure that migration in the US market is efficient, timely and effective.”
EMV: Why Now? What at All?

- EMV migration is not just about security but also about migrating to a global standard that not only offers better security, but is the baseline for new payment products and solutions like mobile payments.

- Key reasons:
  - Security & fraud – last major market for counterfeit cards
  - Future innovation
  - Global standard and interoperability
  - Fewer fraud events benefit consumers and merchants
  - U.S. travelers experience fewer acceptance problems when traveling internationally
EMV Migration Forum Timeline: Summarizing Major Activities

**August 2012**
- EMV Migration Forum announced

**September 2012**
- First Forum meeting

**August 2013**
- Current U.S. Payment Brand Testing & Certification Requirements

**April 2014**
- U.S. Debit EMV Technical Proposal

**December 2014**
- Cryptogram Animation Chip Infographic

**March 2015**
- PIN Change at the ATM Minimum EMV Chip Card & Terminal Req’ts

**July 2015**
- Petroleum Working Committee CHIP IN Education Initiative

**October 2015**
- Liability Shift

**February 2013**
- Standardization of Terminology Glossary

**August 2014**
- Implementing EMV at the ATM

**February 2015**
- Recommended Communications Best Practices

**Industry Education**
- EMV 101 Communications Webinar Merchant Webinar Knowledge Center

**April 2015**
- Recommended Communications Best Practices

**April/July 2015**

**Market Education**
- CVM Video CNP Fraud Webinar CHIP IN

**Industry Education & Collaboration**
- PIN Bypass Testing & Certification Industry Best Practices
Progress in EMV Adoption in the U.S.

✓ Currently U.S. has 200+ million EMV cards issued
✓ Visa chip card issuance in the U.S. is now higher than any other country
  ▪ 151.8 million Visa chip cards issued in the U.S. as of Sept. 15, 2015
✓ Estimated 314,000 merchant locations are now accepting EMV chip transactions
  ▪ SMB retailers account for 50% of Visa’s chip payment volume
✓ Largest retailers report significant number of chip-on-chip transactions
✓ Payments Security Task Force estimates that about 40 percent of terminals will be capable of accepting chip cards by the end of 2015
Resources from the EMV Migration Forum

**EMV Resources on**
www.EMV-Connection.com

- **Web:** GoChipCard.Com
- **Marketing:** CHIP IN campaign
- **Video:** EMV video b-roll
- **White Paper:** “Understanding the 2015 U.S. Fraud Liability Shifts”
- **White Paper:** “Near-Term Solutions to Address the Growing Threat of CNP Fraud”
- **Technical Guidance:** US Debit Technical Proposal
- **Webinar:** Implementing EMV at the ATM – July 14, 2015
EMVCo

• History, Mission and Scope
• Structure

EMVCo’s Activities

• Contact and Contactless Chip Specifications for Card and Mobile Payments
• Type Approval – Terminals, Chip Security, Mobile Handsets
• The Next Generation of EMV Chip Specifications
• Payment Tokenisation
• 3D Secure 2.0

Industry Engagement
History, Mission and Scope
EMV Chip Facilitates Global Interoperability

- Banks conducted pilots of chip cards to reduce high levels of fraud
- Individual countries were adopting the ISO secure chip standard
- Implementing domestic chip standards and specifications did not reduce cross-border fraud
- Three international payment systems developed a global specification

Pilots
ISO
Domestic deployments
Worldwide interoperability
To facilitate the worldwide interoperability and acceptance of secure payment transactions by managing and evolving the EMV Specifications and related testing processes.
Structure
Participation

- Europay, MasterCard, Visa
- Board of Advisors
- JCB joins
- American Express joins
- Expanded industry participation
- UnionPay & Discover Join
Roles of EMVCo and Payment Systems

**EMVCo**

- Manage and evolve EMV Specifications
- Perform product testing & certification
- Enhance payment security
- Support emerging payment technologies

**Global, Regional and Domestic Payment Systems**

- Product development
- EMV roadmap
- Commercial incentives
- Fraud liability shift policy
Activities
Contact and Contactless Chip Specifications for Card and Mobile Payments
## Contact EMV Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Transaction Initiation</td>
<td>Chip Card Insertion</td>
</tr>
<tr>
<td>Transaction Time</td>
<td>1 – 2 seconds</td>
</tr>
<tr>
<td>Form factors</td>
<td>Contact Chip on Card</td>
</tr>
<tr>
<td>Security</td>
<td>EMV cryptography</td>
</tr>
<tr>
<td>Implementation</td>
<td>Global Interoperability</td>
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<tr>
<td>Specifications</td>
<td>EMV 4.3 Contact Chip</td>
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</table>
EMV chip technology is both mature and evolving

- Regularly updated with a focus on increased security, worldwide interoperability and acceptance.
- Actively engaging regional payments industry stakeholders in shaping the specifications.
- Security and interoperability actively addressed via bulletins and specification updates.
## Contactless EMV Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction Initiation</td>
<td>Tap [2-4cm]</td>
</tr>
<tr>
<td>Transaction Time</td>
<td>Fast [&lt; 500ms]</td>
</tr>
<tr>
<td>Form factors</td>
<td>Multiple: Cards, Stickers, Fobs, Watches, Phones</td>
</tr>
<tr>
<td>Security</td>
<td>Secured using the same strong cryptography as contact EMV</td>
</tr>
<tr>
<td>Implementation</td>
<td>Global Interoperability</td>
</tr>
<tr>
<td>Specifications</td>
<td>EMV Contactless 2.5</td>
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</table>
Type Approval – Terminals, Chip Security, Mobile Handsets
Testing and Approval

Terminal Type Approval

- Designed to assess whether EMV chip enabled acceptance terminals sufficiently conform to the functional requirements
- Level 1: verifies conformance to mechanical, electrical and protocol specifications
- Level 2: verifies whether the software demonstrates sufficient conformance

Card / Mobile Handset Type Approval

- Designed to assess whether the chip hardware and embedded EMV functionality sufficiently conforms to electro-mechanical and functional requirements
- Manage the type approval process for payment applications that are compliant with the EMV Common Core Definition (CCD) and Common Payment Application (CPA).
- Expanding to include Level 1 Approval for Mobile Handsets

Chip Security Evaluation

- Designed to assess whether a chip demonstrates sufficient assurance of minimum levels of security
- Including security mechanisms and protections designed to withstand known attacks
Testing and Approval

**EMVCo Role**

- Assess the compliance of vendor products developed to the EMV Specifications
- Terminal Type Approval
- Card Type Approval
- Chip Security Evaluation

**Payment Systems Role**

- Specify the rules regarding how long approved products may be used in the field
- Host system and terminal deployment testing and approval
- Type approval process for chip cards that comply with their card application specifications
- Card functional security evaluation
- Card personalisation approval
EMV Next Generation
To establish a single kernel for acceptance with a common, robust technology platform supporting contact and contactless / mobile interfaces for both online and offline transactions.

- **Future proof EMV security**
- **Employing a layered, modular and flexible design**
- **Simplified device design (e.g. only one offline data authentication method)**
- **Integrated type approval process for contact and contactless**
Project Milestones

2011
Start the EMV Next Generation effort

2012
EMVCo Next Generation scope finalisation

2013
EMV Next Generation high-level architecture completed

2014
EMV Next Generation proof of concept

2015
EMV Next Generation Draft Specification completed

2016
EMV Next Generation Specification completed

2017
Terminal Type Approval Process availability

2025
Payment systems may sunset the issuance of legacy contact/contactless cards

2030
Payment systems may remove legacy cryptography (i.e. keys) from terminals

*The timeline and milestones presented are provisional and subject to change*
Payment Tokenisation
Overview of EMV Payment Tokens

EMV payment tokens further enhance security of digital payments and simplify purchase experience when shopping on mobile, computers or other smart devices.

- Replaces a traditional card account number with a unique payment token
- Restricts the use of a payment token by device, merchant, transaction type or channel

Fraudulent activity reduced because:

- Payment token is limited to a specific acceptance domain
- Payment token can be unlinked from card account number as required
- Card account numbers are less available for compromise
One Example of the Payment Tokenisation Process

Cardholder

Merchant

Acquirer

Payment Network

Issuer

Mobile/Digital Wallet Interaction

Authorisation Request:
• Token
• Token Exp. Date

Authorisation Request:
• Token
• Token Exp. Date

Token Service Provider

Token Vault

De-Tokenise

Token Service Provider

Authorisation Request:
• PAN
• PAN Exp. Date
• Token + Token Exp. Date

Authorisation Request:
• Token
• Token Exp. Date

Authorisation Response:
• Token

Authorisation Response:
• Token
Examples of Token Activity

Broad proliferation of models (remote and proximity) has accelerated token usage:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td>Card-on-File</td>
<td>Merchant uses tokens in lieu of PANs in card-on-file database.</td>
</tr>
<tr>
<td>QR and Bar Code</td>
<td>QR or Bar Code supplier put a “bar-code” in front of card-on-file.</td>
</tr>
<tr>
<td>NFC</td>
<td>Tokens in NFC device.</td>
</tr>
<tr>
<td>EMV Chip</td>
<td>Tokens in EMV chip device.</td>
</tr>
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## EMVCo Payment Tokenisation Goals

### 2015 Goals

#### Q1-3 2015

**TSP registration & listing programme management:**

- List and registration process to be made available on the EMVCo website
- Ongoing work with PCI SSC for investigation of industry standard TSP security requirements

#### 2015 - 2016

**Payment Tokenisation Specification – Technical Framework Updates:**

- Clarifications – including more clarity on assurance levels and aggregator concept
- Payment account reference (PAR)
- Expanded token use cases – transit, EMV chip card offline, 3rd party TSP, ATM, split shipment, receipt-less returns.

### 2015 - 2016

**Ongoing industry engagement:**

- Regional payments bodies
- Global standards bodies
- Merchants, processors, issuers, acquirers
- Payment innovators and others

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### Upcoming Tokenisation Engagement Opportunities:

- **October 21 & 22:** Board of Advisors | Boston, USA
- **October 15:** Seminar | Barcelona, Spain
- **November 3:** Seminar | Jakarta, Indonesia
- **November 4th:** Webinar in conjunction with SCA
3D Secure 2.0
3DS is a messaging protocol which enables consumers to directly authenticate their card with the card issuer when shopping online.

The additional security layer reduces fraudulent use of online credit and debit transactions by...

... preventing unauthorised use of cards online...

... and protecting merchants from exposure to fraud-related chargebacks.

Three domains consist of:

- Merchant / acquirer domain
  - Merchant Integrator (MI)

- Interoperability domain
  - Directory Server (DS)

- Issuer Domain
  - Access Control Server (ACS)
Why a New Version of the 3DS Specification is Required

Support non-browser e-commerce transactions

- In-app purchases (covers all connected device purchases)

Better integration with a merchants offering

- Enabling a smooth process for the challenge response that does not interrupt the merchant check-out experience

Facilitate a cleaner experience without sacrificing security

- Encourage frictionless authentication (where possible)
- Better use of dynamic one-time-passwords
Other Benefits of the New Specification

- Deliver web-based service messaging to be used across multiple platforms
- Offer advance intelligent risk-based decisioning
- Add support for ID&V and digital wallet in addition to enriching current payment authentication flows
- Align to country-specific and regulatory requirements
Support of application based authentication with focus on frictionless experience

Improve the challenge response experience for the consumer when needed

Browser-based payments will continue to be a core function of the 3DS 2.0 framework and will be enhanced to leverage the new features

ID&V flows enabled via the 3DS 2.0 framework

Digital Wallet integration with 3DS 2.0

2015 + Industry engagement to ensure alignment with market requirements

2016 EMV 3DS 2.0 specification published, testing and approval process defined

Continued enhancement and ongoing maintenance of the specification and related processes based on industry feedback

* The content and timeline presented is provisional and subject to change.
Industry Engagement
EMVCo actively engages the payment community in shaping future specifications

<table>
<thead>
<tr>
<th>Industry Engagement</th>
<th>Interactive Forums</th>
<th>Information Sharing</th>
</tr>
</thead>
</table>
| • EMVCo Associates Programme  
  • Business Associates  
  • Technical Associates  
  • Subscriber meetings  
  • Partnership & liaison activity | • Speaking engagements  
  • Panels  
  • Seminars  
  • Webinars | • Website  
  • LinkedIn  
  • Press releases  
  • Specifications  
  • White papers  
  • Other publicly available content |
Engagement with Global Organisations

- PCI SSC: Data Security
- NFC Forum: Contactless
- GlobalPlatform: Multi-Application Secure Platform
- EMVCo: Security Interoperability and Emerging Payments
- GSMA: Mobile Applications

ISO Standards
**Objective** – Engage with regional and national bodies as needed to support the continued migration to EMV technology

Other bodies

EMVCo
Security
Interoperability and Emerging Payments

Examples include:

- Asia Pacific Smart Card Association (APSCA)
- European Payments Council (EPC)
- Association Francaise du Sanger Contact Mobile (AFSCM)
- ETSI
- Smart Card Alliance
- EMV Migration Forum

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EMVCo Associates Programme (EAP)
Benefits:

Access
Engage and connect with EMVCo’s Executive Committee, Board of Managers and Working Groups

Insight
Learn more about EMVCo’s work programme, including future initiatives

Influence
Contribute to the future evolution of the EMV Specifications by sharing expertise, experience and requirements

Foresight
Receive advanced updates on EMV Specifications and technical amendments
Sample EMVCo Associate Engagement Topics

- Payment Tokenisation
- Next generation migration
- Terminal security
- Terminal integration testing
- Mobile acceptance
- Handset approvals
- 3DS 2.0
**EMVCo serves as an industry utility to promote secure & interoperable payments worldwide by:**

| **Actively engaging regional payments industry stakeholders in shaping the specifications** |
| **Promoting interoperability through global monitoring & specification enhancements** |
| **Providing royalty free access to specifications aligned with ISO standards** |
| **Developing underlying security mechanisms to provide robust protection within EMV environments** |
| **Continuously evaluating new payment technology developments relevant to EMVCo’s scope** |
Wrap-Up
Wrap-Up

• **Next Smart Card Alliance and EMVCo Webinar: Focus on Tokenization**
  ▪ NEW date: November 4, 2015, 1:00pm ET/10:00am PT
  ▪ Register at: [https://attendee.gotowebinar.com/register/9008007764697218561](https://attendee.gotowebinar.com/register/9008007764697218561)

• **Events**
    • October 15, Barcelona, Spain
    • November 3, Jakarta, Indonesia
  ▪ Smart Card Alliance Payments Summit, April 5-7, 2016

• **Resources**
  ▪ EMVCo web site, [http://www.emvco.com](http://www.emvco.com)
  ▪ Smart Card Alliance web site, [http://www.smartcardalliance.org](http://www.smartcardalliance.org)
  ▪ EMV Connection web site, [http://www.emv-connection.com](http://www.emv-connection.com)
  ▪ GoChipCard.com web site, [www.gochipcard.com](http://www.gochipcard.com)
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