Is Your Organization Ready for the EMV Challenge?

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• What is EMV?
• Key Definitions
• Why is the U.S. Switching to EMV?
• What EMV brings to the Market
• U.S. timeline for POS and ATM EMV Conversion
• Costs from EMV Transitioning
• Marketplace Perspective
EMV (An acronym of “Europay, MasterCard and Visa”) is an international standard for “smart” cards containing microprocessor chips, which store payment and other information.

More than 1.3 billion such chip cards have been issued, usable at more than 15 million payment terminals and tens of thousands of ATMs globally.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Chip-and-PIN</td>
<td>Requires a personal identification number to access customer’s authentication credentials in the card’s chip at payment terminals and ATMs</td>
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<td>Chip-and-Signature</td>
<td>An EMV transaction in which a signature is used for cardholder verification at the POS</td>
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<td>Contact Transaction</td>
<td>Initiated by inserting an EMV card into a payment terminal or ATM</td>
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<tr>
<td>Contactless Transaction</td>
<td>Initiated by tapping a card’s chip that uses RFID technology to transit card credentials to a similar chip in a merchant’s terminal</td>
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<tr>
<td>Dual Interface</td>
<td>Cards having both a contact and contactless function from the same EMV chip</td>
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<td>Near Field Communication (NFC)</td>
<td>Contactless two-way communication between devices with similar NFC chips for exchanging payment and other information, such as coupons</td>
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Why is the U.S. Switching to EMV?

- Fraud migrates along a path of least resistance, and the U.S. reliance on mag-stripe cards makes it a target.
- EMV cards are significantly more difficult to counterfeit; currently it is effectively impossible.
- Requiring a PIN to access the card’s chip boosts security.
- Card-authentication credentials with EMV cards are dynamic, meaning transaction information can be used only once.
- As other countries move to EMV, use of mag-stripe cards outside the U.S. is becoming a problem.
What EMV Brings to the Market

**Benefits**
- Reduces counterfeit losses
- Greater efficiency
- More secure process
- Global consistency

**Challenges**
- Cost
- PIN or signature?
- Contact and Contactless?
- Education
Fraud on Cards Issued in the U.K., 2001–2012

In Millions, GBP

Source: UK Payments Association, 2013

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U.S. Road Map for POS EMV Conversion

10/1/2012
PCI Relief for Early Conversion

4/1/2013
Merchant Acquirer Requirement

10/15/2015
Merchant Fraud Liability Shift

10/15/2017
Fraud Liability Shift for Gasoline Retailers

*Discover, Amex deadline is 10/1/2013

*Discover deadline is 10/16/2013

*Discover deadline is 10/1/2015

*Discover deadline is 10/1/2017
April 19, 2013 MasterCard: Liability shift for U.S. acquirers and subprocessors to process EMV transactions fully and to non-EMV-compliant ATMs accepting cross-border Maestro ATM transactions from internationally issued cards

April 1, 2015 Visa: U.S. third-party ATM acquirers, processors and subprocessors must be able to support EMV chip data

October 2016 MasterCard: Liability shift for acquirers and subprocessors to process EMV transactions from U.S.-issued EMV cards

October 1, 2017 Visa: Liability will shift in the U.S. to non-EMV ATMs

Sources: Company Announcements, Mercator Advisory Group, 2013
Costs from EMV Transitioning

- Replacing POS Terminals and Upgrading ATMs
- Card Reissuance
- Consumer Education
- Back-Office Upgrades
- Upfront Costs, Delayed Benefits
- Customer Service
- Dual Interface?
• The U.S. will not bypass EMV and jump directly to NFC
• Prudent issuers will issue dual-interface cards from the start
• Mag-stripes will be included on cards until EMV terminal presence approaches 100%
• Work with your vendors
Agenda

• Elan Participation in U.S. EMV Migration
• Magnetic Stripe vs. EMV Chip Card Comparison
• Chip Application Selection
• Choosing Your EMV Chip Card Profile
• Card Authentication Method
• Transaction Authorization
• Cardholder Verification Method
• Contact Chip vs. Dual Chip Interface
• Readying Your ATM Fleet for EMV
• Process to an EMV Conversion
Elan is an Active Participant in the U.S. EMV Migration

Smart Card Alliance EMV Migration Forum

- Debit Committee
- Communication and Education
- Testing and Certification
- EMV Deployment
- ATM Migration

Elan will be fully EMV compliant on or before October 1, 2015

Support of most EMV Card Profiles, including Online and Offline PIN Authorization and Authentication, Contact and Contactless Technology

- October 1, 2015 – Visa and MasterCard Acquirer Fraud Liability Shift, POS
- October 1, 2016 – MasterCard Acquirer Fraud Liability Shift, U.S. ATMs
- October 1, 2017 – Visa Acquirer Fraud Liability Shift, ATMs

Note: No announced network mandates for Card Issuers to support EMV.
Magnetic Stripe vs. EMV Chip Card Comparison

Magnetic Stripe
- Holds a limited amount of data
- Static - has no processing intelligence
- Simply provides information to any terminal
- Re-Issued when change is required

EMV (Chip) Card
- Holds much more data
- Dynamic – includes processing intelligence that affect how the card works and can be used
- Parameters can be changed once card is in the consumer’s hands
Chip Application Selection

### Application Code Memory
- Payment Brand 1 Application (code)
- Payment Brand 2 Application (code)

### Application Data Memory
- AID 1 application data
- AID application 2 data
- AID application 3 data

<table>
<thead>
<tr>
<th>Payment Network</th>
<th>Chip Application</th>
<th>Application Identifier (AID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visa</td>
<td>VSDC</td>
<td>A00000000031010</td>
</tr>
<tr>
<td>MasterCard</td>
<td>M/Chip</td>
<td>A00000000041010</td>
</tr>
<tr>
<td>Discover/PULSE</td>
<td>DPAS</td>
<td>A0000001523010</td>
</tr>
<tr>
<td>American Express</td>
<td>AEIPS</td>
<td>A00000002501</td>
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Choosing Your EMV Chip Card Profile

1. Card Authentication
2. Transaction Authorization
3. Cardholder Verification
4. Contact, Contactless or Dual Interface

No CVM
Offline PIN
Online PIN
Signature

Online
Offline

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1. Card Authentication Method (CAM)

Online Card Authentication Method
- Performed during online authorization
- ARQC: Dynamic cryptogram generated by the card
- Authenticates the card (prevents counterfeit cards / ATM skimming)
- Authenticates transaction data (transaction amount, currency…)

Offline Card Authentication Method
- Performed during an offline authorization
- SDA: Static Data Authentication
- DDA: Dynamic Data Authentication
- CDA: Combined Data Authentication
- DDA & CDA are dynamic (provides additional skimming protection)
2. Transaction Authorization

Online Authorization
- Performed by the issuer or issuer processor

Offline Authorization
- Performed by the card and terminal
- Does not require a connection to the issuer or issuer processor
3. Cardholder Verification Method (CVM)

- Cardholder verification authenticates the cardholder.
- A personal identification number (PIN) is a common cardholder verification method (CVM) used to authenticate the cardholder.
- EMV supports four types of CVMs, allows the use of multiple CVMs, and defines the conditions under which they may be used:
  - Online PIN
  - Offline PIN
  - Signature
  - No CVM
4. Contact Chip vs. Dual Chip Interface

- EMV card usage will be an education issue for most consumers.
- Contactless payments will have to be promoted by both banks and merchants as very few consumers use this method now.

- MasterCard PayPass
- Visa PayWave
Readying Your ATM Fleet for EMV

• Customer Experience and Education

• Dip vs. Motorized readers and screen change requirements.

• PIN management/changes/unlock at the ATM…… ‘scripting’.

• ATM networks must support EMV transactions.

• Contactless/NFC support at ATM.

• Liability Shift Dates
  – April 2013, Oct 2016, Oct 2017
  – MasterCard Fraud Manager
Process to an EMV Conversion

• **Find Out the Readiness of Players Involved**
  – Card Personalization vendors
  – Regional PIN Network
  – Processor

• **Program Cost**
  – $$$ is determined by chip selection and encryption type
  – Testing and Certification

• **Setting a Target Date to Begin your EMV Transition**
  – 4 - 6 months depending on the U.S. market readiness
  – Up to 9 months for Offline PIN capabilities

• **Booking a Space within the EMV Production Queue**
  – Discuss registration with your payment network
Questions?

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