Session Overview

In this session: Fiserv answers your top questions on EMV

Why EMV?
What is the market status?
What should I be doing?
What is Fiserv doing?
Why EMV?
EMV Adoption in the U.S.
Why it Makes Sense

- Improved security
- Better experience for international travelers
- Worldwide interoperability
- Positioning the industry for other forms of payment - NFC
# Liability Shift Dates

Transfer liability for certain types of fraudulent transactions away from the party that has the most secure form of EMV technology.

<table>
<thead>
<tr>
<th></th>
<th>accel</th>
<th>Visa</th>
<th>MasterCard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P.O.S.</strong></td>
<td>October 2015</td>
<td>October 2015</td>
<td>October 2015</td>
</tr>
<tr>
<td><strong>ATM</strong></td>
<td>October 2017</td>
<td>October 2017</td>
<td>October 2017</td>
</tr>
<tr>
<td><strong>Pay at Pump/Gas</strong></td>
<td>October 2017</td>
<td>October 2017</td>
<td>October 2017</td>
</tr>
</tbody>
</table>

- **April 2013**
  - Specific to cross border Maestro transactions where the issuer is non-U.S. at a U.S. ATM

- **October 2016**
  - All transactions on any MasterCard network
Overview of Chip Cards

What is a chip card?

- Plastic card containing a chip or integrated circuit
- Chip uses an application structure to support various functions
- Cards have only one chip in the card, but may contain multiple applications
- Contact chip cards have the chip contact faceplate on the front of the card
- Chip cards issued in the U.S. will also have a magnetic stripe on the reverse side
- Chip cards can be contact chip, contactless, or dual interface cards (supports both contact and contactless)
Ubiquity in the U.S.

- All U.S. issued EMV chip cards will have a chip and a magnetic stripe
  - Contact chip and magnetic stripe
  - Dual interface chip (contact and contactless) and magnetic stripe
## Top Chip Terms

**Terms to Use**

- **Chip Card**
  (or potentially “EMV chip card” for first reference)

- **Insert**
  (as in “insert your chip card”)

**Terms to Avoid**

- **Integrated Circuit Card (ICC)**

- **Chipped Card / Chipped**
  (as in “your card will be chipped”)

- **Chip-and-Signature**
  (unless specifically referring to signature as a verification method on a chip card)

- **Chip-and-PIN**
  (unless specifically referring to PIN as a verification method on a chip card)

- **Microchip**

- **EMV Card**

- **Smart Chip**

- **Smart Card**

- **Dip**
  (a popular marketing phrase used during the U.K. chip migration)

---

Source: EMV Migration Forum
Chip Card Complexity

The EMV chip is a computer chip with an operation system, application and data storage. The terminal and chip card interact according to EMVCo specifications to process transactions. Magnetic stripes are simple. The complexity created by turning a mag stripe into a computer is enormous.

Sample Magnetic Stripe Data - Easy to read, easy to replicate.
BHEREISYOURCARDNUMBER^HEREIS/YOURNAME^EXPIREDATESERVICESCODECVV

Sample Chip Data
## Worldwide EMV Deployment and Adoption

<table>
<thead>
<tr>
<th>Region</th>
<th>EMV Cards</th>
<th>Adoption Rate</th>
<th>EMV Terminals</th>
<th>Adoption Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada, Latin America, and the Caribbean</td>
<td>471M</td>
<td>54.2%</td>
<td>7.1M</td>
<td>84.7%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>942M</td>
<td>17.4%</td>
<td>15.6M</td>
<td>71.7%</td>
</tr>
<tr>
<td>Africa &amp; the Middle East</td>
<td>77M</td>
<td>38.9%</td>
<td>699K</td>
<td>86.3%</td>
</tr>
<tr>
<td>Europe Zone 1</td>
<td>794M</td>
<td>81.6%</td>
<td>12.2M</td>
<td>99.9%</td>
</tr>
<tr>
<td>Europe Zone 2</td>
<td>84M</td>
<td>24.4%</td>
<td>1.4M</td>
<td>91.2%</td>
</tr>
</tbody>
</table>

*Figures reported in Q4 2013 and represent the latest statistics from American Express, Discover, JCB, MasterCard, UnionPay, and Visa, as reported by their member institutions globally.*

<table>
<thead>
<tr>
<th></th>
<th>EMV Cards</th>
<th>Adoption Rate</th>
<th>EMV Terminals</th>
<th>Adoption Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Estimates</td>
<td>~17-20M</td>
<td>~1-2%</td>
<td>~2M</td>
<td>~20%</td>
</tr>
</tbody>
</table>

Source: Estimates stated from The Smart Card Alliance/EMV Migration Forum, May 2014

Source: EMV Migration Forum
Example of a Secure EMV Transaction

EMV introduces a change to the consumer experience at POS. The chip card and terminal must stay in constant contact due to the dynamic exchange of data that provides increased security.

Payment Method
- Contact or Contactless

Card Authentication
- Online (using Dynamic Cryptogram)
- Offline (using SDA, DDA or CDA)*

Cardholder Verification
- Signature
- Online PIN
- Offline PIN*
- No CVM

Transaction Authorization
- Online Offline*

* Will not be supported in Fiserv solution

“Offline” relative to EMV is unique. Offline means the chip card and terminal are able to authenticate and authorize a transaction based on logic, within the payment application, without a host approval.
Which Comes First: Issuer or Merchant?
Cardholder Predicament

- How do I get a chip card?
- When do I need to sign for a purchase?
- If I am using my credit card, why do I have to enter in a PIN?
- Is personal information stored on the chip?
- What is EMV?!!
- How do I know if I should swipe or insert the card?
- Will the merchant charge me more?
- Will all my cards have a chip?
- Where can I use this chip card and how will I know?
- How do I get cash from an ATM?
- What does contactless mean?
- Will my mag stripe still work?

Source: EMV Migration Forum
Merchant Dilemma

- What if I am not ready by October 2015?
- What about my gift and private label card – can I accept those?
- What is the best CVM method?
- None of my customers have chip cards, so why upgrade?
- How will I know when a customer needs to insert or swipe?
- How will my customers know I am chip ready?
- What if the chip card isn’t working or my customer forgets their PIN?
- What about mobile payments or accepting contactless?
- What is EMV?
- I don’t have fraud – do I have to upgrade?
- Will it cost more to accept a chip card?
# U.S. EMV Deployment

<table>
<thead>
<tr>
<th>EMV Chip Cards</th>
<th>Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit</strong></td>
<td><strong>Debit</strong></td>
</tr>
<tr>
<td>U.S. credit card issuers beginning to deploy cards with chip.</td>
<td>U.S. debit card implementation is unique from other markets due to U.S. regulatory requirements.</td>
</tr>
<tr>
<td>U.S. EMV credit card implementation is no different from other global markets.</td>
<td>U.S. debit cards must support the U.S. Common Debit AID to support multiple debit networks, e.g. Accel.</td>
</tr>
<tr>
<td>Credit EMV is universal. U.S. issued EMV credit cards work in U.S. and internationally.</td>
<td>It will take time for U.S. Common Debit AID standard to proliferate broadly.</td>
</tr>
</tbody>
</table>
The Importance of Communication
Inaccurate and Inconsistent Communication = Confusion

Every credit card in the U.S. will be replaced by October 2015 with new cards that contain the chip-and-PIN technology that the rest of the world has had for years,

The U.S. is moving to new chip cards based on a global standard called EMV, already in use in 2.37 billion payment cards worldwide, to enhance in-person payment security for consumers, merchants and issuers.

Throughout this year, consumers should start receiving their new chip cards, and by 2015 will be able to use them more frequently to pay at retail outlets.

…Chip-and-PIN cards, often referred to as EMV cards due to the common standard for the technology created by Europay, MasterCard and Visa, have gained popularity because the cardholder data stored on the chip is encrypted and the cards are almost impossible to duplicate.....

EMV chip cards contain secure computer chips that validate the authenticity of the card and include a one-time use security code in every transaction, making chip payment data virtually impossible to use for counterfeit card fraud.

Source: EMV Migration Forum
Cardholder Experience

How a chip card works in a mixed acceptance device environment

- There are many terminals in market today with the chip reader that do not support chip cards. This could cause some cardholder confusion/frustration.
- If a chip card is swiped in a chip card enabled terminal the terminal will prompt the cardholder to insert the card into the reader.

Source: EMV Migration Forum
Merchant / Device Differences

Different merchant and device environments will have unique experiences and timelines for EMV deployment.

Restaurants
- Terminal to table
- PIN or signature
- Add tip on device prior to making a payment

ATM
- Online PIN—required

Automated Fuel Dispensers (AFD)
- Pay at pump with PIN
- Pay at pump No CVM
- Pay inside with PIN or signature

Source: EMV Migration Forum
Who Educates the Cardholder?

- **Issuer**
  - Chip awareness
  - Usage instructions
  - Chip value proposition
  - FAQs
  - Merchant/ATM location finder

- **Merchant**
  - Acceptance awareness at POS
  - Assistance at POS

- **Payment Network**
  - Chip awareness

- **POS / ATM Owner / Operator**
  - Instructions on / around POS / ATM
  - Messaging on LED screen

---

Source: EMV Migration Forum

© 2014 Fiserv, Inc. or its affiliates.
Who Educates the Merchant?

- **Acquirer**
  - Acquiring Processor
  - ISO
    - Specifications
    - Operating Rules
    - Testing & Certification requirements

- **Standards Body / Regulators**
  - Specifications
  - Regulations

- **POS / ATM Owner / Operator**
  - Product capabilities
  - Operating instructions

- **POS / ATM Manufacturer / Supplier**
  - Product capabilities
  - Operating instructions
  - Specifications
  - Testing & Certification requirements

- **Merchant (Tier 3 & 4)**
  - Best practices
  - Educational resources
  - Standardized terminology
  - Lessons learned
  - Acceptance awareness at POS
  - Assistance at POS

- **Industry Organization**

*Tier 3 and 4 Merchants: Less than 1 million transactions per year, though precise classification can vary.*

Source: EMV Migration Forum
Recommendations and Next Steps
## The Cost Factor

<table>
<thead>
<tr>
<th>Initiative</th>
<th>EMV Potential Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraud Reduction</td>
<td>An EMV chip card is only authenticated in a card-present transaction and makes counterfeiting more difficult, if not impossible. Chip cards do not offer security benefits for Card-Not-Present transactions. Current fraud estimates are as follows: 3 Basis Points <em>(Source: Fiserv Risk Office client best-in-class average)</em> 9 Basis Points <em>(Source: Federal Reserve Board published card fraud average)</em> Cost savings associated with card-present fraud reduction will vary greatly by financial institution</td>
</tr>
<tr>
<td>Program Implementation</td>
<td>$5,000-$10,000 one-time fee from vendor and partner engagements $1,000 per BIN for Visa and MasterCard fees</td>
</tr>
<tr>
<td>Incremental Cost per Card</td>
<td>$1.50 chip plastic $.50 personalization</td>
</tr>
<tr>
<td>Incremental Transaction</td>
<td>$.005 - $.01 per transaction</td>
</tr>
<tr>
<td>Authentication Fee</td>
<td></td>
</tr>
<tr>
<td>Device Upgrades POS/ATM</td>
<td>Device: $250-$300, depending on device type POS/ATM: $2,000-$5,000 per device <em>(Fiserv solution requires ATMs utilize a Windows 7 OS)</em></td>
</tr>
<tr>
<td>Instant Issuance Equipment</td>
<td>As high as $25,000 per branch location, varies greatly by supplier</td>
</tr>
<tr>
<td>Upgrade Staff Training</td>
<td>Varies by financial institution</td>
</tr>
<tr>
<td>and Consumer Education</td>
<td></td>
</tr>
</tbody>
</table>
# Recommendations for EMV Deployment

| Create a plan | • Time to plan is now |
| Prioritize | • Focus on credit first.  
• Issue debit cards personalized with the Common AID to avoid reissuance |
| Transitional approach | • Migrate card portfolios and ATMs over time |
| Go with a simplified, compliant strategy | • Deploy EMV with the capabilities required for security benefits/compliance protection; extras can come later |
| Take action | • Start migration soon to ensure timely conversion of portfolio  
/ Submit a project to get in the queue |
| Evaluate investments as part of a larger initiative | • Prepare ATMS with an EMV compliant reader as part of a larger initiative to upgrade ATM relative to end of life of Windows XP operating systems |
What You Can **AND** Should Be Doing

Understand your card personalization options and expenses
- **Contact** vs. dual interface
- **Online** vs. offline

Address how you assign PAN numbers
- EMV requires each cardholder to use a unique PAN for application transaction counter (ATC) increment authentication
What You Can **AND** Should Be Doing

**Review Your Card Designs**
Consider reducing the number of designs to optimize plastic inventory requirements
What You Can AND Should Be Doing

- Analyze your portfolio
- Identify international travelers
- Evaluate current reissuance cycles
- Consider reducing the duration
- Budget, plan and educate
- Create internal awareness and engage your partners
**EMV Chip Card Program Implementation Timeline**

<table>
<thead>
<tr>
<th>Planning Month 1</th>
<th>Requirement Definition</th>
<th>Implementation Execution</th>
<th>Institution Readiness</th>
<th>Launch Month 4-6</th>
</tr>
</thead>
</table>
| Develop business case  
  • Discuss with all vendor partners  
  • Obtain cost estimates  
  • Consider ROI | Determine personalization profile | Generate EMV keys | Develop card issuance/replacement strategy (i.e. portfolio segmentation; international travelers, credit) | Launch pilot (consider smaller, less complicated segment) |
| Determine card stock design and quantity, considering chip placement | Submit network paperwork | Inform and educate internal staff (i.e. branch and back-office) | Validate and monitor transactions at EMV enabled merchants/ATMs |
| Determine card mailer design and collateral needs | Order card stock | Inform and educate cardholders | Rollout chip card issuance according to your replacement strategy (card reissuance, replacement and newly issued) |
| Identify certification requirements (if applicable) | | Update instant issuance equipment (if applicable) |
| Decide on card and transaction authentication method (online or offline) | | |
| Decide on card interface (contact, contactless, dual interface) | | |
| Decide on cardholder verification method (signature, online PIN, offline PIN, no CVM) | | |

Note: this document represents a high-level EMV card program timeline and does not include all necessary steps in the process. Phases/milestones do not need to be performed sequentially and may occur in parallel.
The Fiserv EMV Solution

- Strategic guidance & portfolio optimization
- Plastic procurement & card personalization
- Risk management
- Transaction processing
- FI and consumer education
Solution Objectives

Enable financial institutions to transition their card and ATM portfolio to EMV via a cost effective, streamlined, efficient and transitional approach

Provide a consultative solution based model, not a technology answer

Avoid EMV “disruption” in achievement of our clients’ business goals and priorities

Offer standardized and packaged EMV solutions to simplify implementation process and economize cost and investment
Plastic Procurement and Personalization

• **Authentication:** Online or offline SDA, DDA CDA

• **Plastic:** Custom Litho, Print-on-Demand (white plastic) and Card Collection™

• **Payment applications:** Visa VSDC 2.7. or 2.8, MasterCard M/Chip™ Lite or Select 4, Discover D-PAS and American Express AEIPS

• **Operating platforms:** Java/Global & Multos

• **Card types:** Contact and dual Interface

• **Chip:** Variety of sizes
Transaction Processing

- Process debit, credit and ATM EMV transactions
- Perform EMV transaction authentication
- Generate, store and manage EMV keysets
- Gradually transition portfolios to EMV chip cards, without mass reissuance
- Automatically reissue mag strip card as chip card
- Drive EMV-enabled ATM machines
Seamless, integrated and highly effective multi-layered "deep defense" fraud mitigation strategies.

Defend against increasingly complex and changing fraud scenarios for both card-present and card-not-present behaviors.

Incorporate EMV data into holistic fraud defense system focused on mitigating portfolio risk.
Communication and Education

One Integrated Solution

- Analytics
- Campaign Design
- Creative Services
- Multi-Channel Customer Delivery

- EMV consumer and FI education
- Carriers, inserts, direct mail, email, webinars
- Improve the customer experience
- Ensure a smooth migration
# EMV Product Line Strategy

<table>
<thead>
<tr>
<th>Credit</th>
<th>Debit</th>
<th>ATM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategy</strong></td>
<td><strong>Time to move is now! “Submit a project”</strong></td>
<td><strong>Get your ATM EMV ready (EMV reader)</strong></td>
</tr>
<tr>
<td>• Lead with credit.</td>
<td>• <strong>Time to move is now! “Reserve a slot”</strong></td>
<td>• U.S. Common Debit AID proliferation still in process to ready all debit rails.</td>
</tr>
<tr>
<td>• U.S. implementation same as global markets.</td>
<td>• U.S. Common Debit AID proliferation still in process to ready ATM / kernel software.</td>
<td>• Prioritize ATMs with liability exposure. (Maestro Cross Border)</td>
</tr>
<tr>
<td>• Smaller portfolios to gain experience in EMV deployment.</td>
<td>• EMV enable your BIN, measured approach to card issuance.</td>
<td></td>
</tr>
</tbody>
</table>

## Status
- **Credit**: MasterCard and Visa pilots in process.
- **Debit**: Awaiting card vendor support for personalization of U.S. Common Debit AID card products.
- **ATM**: ATM Device level certification in process for Fiserv driven ATMs. Pilots planned for Fall.
  
  Note: clients that drive their own ATMS require device level end to end certification with Visa and MasterCard.
# Recommended Issuer Guidelines

<table>
<thead>
<tr>
<th>EMV Options</th>
<th>Visa</th>
<th>MasterCard</th>
<th>Fiserv Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Card Interface</strong></td>
<td>Issuer choice</td>
<td>Issuer choice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dual-interface or contact chip card with companion contactless mobile application</td>
<td>Dual-interface recommended for best cardholder experience</td>
<td>Contact Only</td>
</tr>
<tr>
<td><strong>Card Authentication</strong></td>
<td>Online</td>
<td>Online DDA/CDA if offline is supported (issuer choice)</td>
<td>Online</td>
</tr>
<tr>
<td><strong>Transaction Authorization</strong></td>
<td>Online</td>
<td>Online Offline if issuer opts to support</td>
<td>Online</td>
</tr>
</tbody>
</table>
| **Cardholder Verification** | Issuer choice Signature, online PIN (debit), no CVM | Issuer choice signature, online PIN, offline PIN, no CVM        | **Credit:** Signature, NO CVM (online PIN for ATMS)  
**Debit:** Online PIN/Signature/No CVM |

### Fiserv Solution ATM EMV Enablement

<table>
<thead>
<tr>
<th>Network</th>
<th>EMV cards supported</th>
<th>Diebold Windows 7 Agilis 3</th>
<th>NCR Windows 7 Edge 5</th>
<th>All other ATMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MasterCard</td>
<td>International Debit International Credit US Credit</td>
<td>Supported Pilot Fall 2014</td>
<td>Supported Pilot Fall 2014</td>
<td>Future Support</td>
</tr>
<tr>
<td>Visa</td>
<td>International Debit International Credit US Credit</td>
<td>Supported Pilot Fall 2014</td>
<td>Supported Pilot Fall 2014</td>
<td>Future Support</td>
</tr>
<tr>
<td>Accel / U.S. Debit Networks</td>
<td>US Common Debit AID Future support Currently not available</td>
<td>Future support</td>
<td>Future support</td>
<td>Future Support</td>
</tr>
</tbody>
</table>

EMV is not supported on ATMs using Windows XP or OS2 operating systems.
Further Education and Information

EMV Web site resources: www.Fiserv.com/EMV

EMV Quick Reference guides on client portals

Contact your Card Services Account Manager or sales representative
Wrap-up

Questions?
Thank you!

For more information, please contact

Allison Edwards
allison.edwards@fiserv.com
973-682-5521