Implementing EMV in the U.S.

How the U.S. Common Debit AIDs Facilitate Debit Transaction Routing and Ensure Durbin Compliance

August 7, 2017
Background

• Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1075, a.k.a. “Durbin Amendment” (paraphrased)

...all debit cards will need to participate in at least two unaffiliated networks so that transactions initiated using those debit cards will have at least two independent routing channels. The two unaffiliated networks could be one PIN network and one signature network (the most common configuration), two signature networks or two PIN networks (in each case so long as the two networks are not affiliated).

– Impacts POS debit transactions
– Read more about it starting on page 697 of: http://www.sec.gov/about/laws/wallstreetreform-cpa.pdf

• With the introduction of EMV
  – Durbin compliance is still required
  – Merchant routing choice must be preserved

• Durbin amendment
  – Applies to POS transactions initiated by U.S.-issued debit cards at U.S. terminals
  – Doesn’t mention credit transactions
  – Doesn’t mention ATM transactions
What’s on a Magnetic Stripe Card?

**Track 1**: maximum of 79 characters

<table>
<thead>
<tr>
<th>%B</th>
<th>Primary Account Number</th>
<th>^</th>
<th>Name</th>
<th>^</th>
<th>Expiration Date</th>
<th>Service Code</th>
<th>Discretionary Data</th>
</tr>
</thead>
</table>

**Track 2**: maximum of 40 characters

<table>
<thead>
<tr>
<th>;</th>
<th>Primary Account Number</th>
<th>=</th>
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</tr>
</thead>
</table>

**Track 3**: maximum of 107 characters

Not used in most financial applications
Magnetic Stripe Transaction: Authorization Request

1. Terminal reads track data

2. Request

3. BIN? PIN or signature?

4. Request

5. Issuer makes authorization decision

– Magnetic stripe card at magnetic stripe terminal
Magnetic Stripe Transaction: Authorization Response

– Magnetic stripe card at magnetic stripe terminal
Chip Card Technology

- Documents
- Web Pages
- Pictures

Information

Application

• Word Processor
• Browser
• Photo Editor

Application

• Application 1 Data

Application

• Application 1 – AID 1
• Application 2 – AID 2
• Application 3

Operating System

- e.g. Windows 10
- e.g. Multos

Hardware

- e.g. Intel/AMD
- e.g. Infineon
What’s on a Chip Card?

Data Required for Each Application on a Contact Chip Card:

- Keys for Authentication
- Risk Management Parameters
- Application-Specific Data
- Cardholder Data

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Track 3: maximum of 107 characters

Not used in most financial applications
Global Payment Networks and Global AIDs

- “Global AID”: an AID that is owned by the global/international payment network whose logo is on the card
- When a global AID is selected, the transaction is routed to the associated global payment network
Introducing EMV Brings Challenges

- The transaction is routed to the associated global payment network
- How can we preserve the routing choices we have today, and comply with Durbin?
- What AIDs can be used on cards that do not exclusively carry the brand of a global payment network?
One solution: U.S. Common Debit AIDs

U.S. debit chip cards will typically contain
  – A payment network-specific ("global") AID
  – A U.S. Common Debit AID
Available AIDs for Merchant Routing Choice

• U.S. Common Debit AID
  – Discover
  – Mastercard
  – Visa
  – UnionPay
  – Shared Debit AID from Debit Network Alliance (DNA)
    • www.debitnetworkalliance.com
Impact to U.S. Issuers: Debit Chip Cards that Support Global Payment Networks

- These debit chip cards typically contain:
  - A debit application from a global payment network
    - e.g. Discover, Mastercard, Visa
  - A global AID from that global payment network
    - Needed for use outside of the U.S.
  - A U.S. Common Debit AID from that global payment network
    - For use in the U.S. for transaction routing to any available debit network, including the global payment network

- Both AIDs point to the same funding account
  - For example, a single debit account

![Diagram of debit chip card showing AIDs and Debit Application](image)
Impact to U.S. Issuers:
Debit Chip Cards that do not Support a Global Payment Network

– These debit chip cards typically contain:
  • A debit application that meets the criteria specified by the DNA
  • The DNA Shared Debit AID (for use in the U.S.)
– No other AID will be on chip cards that support the Shared Debit AID
– Application Selection
  • Terminal will determine what AIDs are mutually supported between the chip card and the terminal
    – When there is more than one mutually-supported AID, the AID to use for the transaction may be selected by either
      » The merchant (via parameters setup in the terminal)
      » The cardholder
Application Selection – Same Funding Account

– Terminal selects AID based on terminal parameters set by the merchant
  • Preserves merchant selection of routing
  • Needed to support U.S. Common Debit AIDs
  • Can allow cardholder choice if supported

AIDs Supported by Terminal (Example)

<table>
<thead>
<tr>
<th>AID Type</th>
<th>AID Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visa Debit (Global) AID</td>
<td>A0000000031010</td>
</tr>
<tr>
<td>Visa U.S. Common Debit AID</td>
<td>A0000000980840</td>
</tr>
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AIDs Supported by Chip Card (Example)

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Terminal selects either:
- U.S. Common Debit AID for domestic payment network routing
- Global AID for global payment network routing
## Application Selection – Different Funding Accounts

### Cardholder selection
- Terminal presents short description of AIDs on screen

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<tr>
<td>Visa Debit (Global) AID</td>
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</tr>
<tr>
<td>A0000000003101001</td>
<td>A0000000003101001</td>
</tr>
<tr>
<td>Visa Credit</td>
<td>Visa Credit</td>
</tr>
<tr>
<td>A0000000003101001</td>
<td>A0000000003101001</td>
</tr>
</tbody>
</table>

Please select one of the following:
- Visa Debit
- Visa Credit

Cardholder selects either:
- AID for debit
- AID for credit
Impact to U.S. Terminal Owners and Acquirers

- U.S. terminals (ATM and POS) will need to support multiple AIDs if they participate in multiple networks
  - Global AIDs
    - For the global payment networks
  - U.S. Common Debit AID
    - For those same global payment networks and U.S. domestic payment networks
    - Shared Debit AID from the DNA
      » For U.S. domestic payment networks

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<th>Debit AIDs Supported by a U.S. Chip-Enabled Terminal (Example)</th>
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<td>Diner’s Club/Discover (Global) AID</td>
</tr>
<tr>
<td>Discover U.S. Common Debit AID</td>
</tr>
<tr>
<td>Mastercard Debit (Global) AID</td>
</tr>
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<td>Mastercard U.S. Common Debit AID</td>
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<tr>
<td>Visa U.S. Common Debit AID</td>
</tr>
<tr>
<td>DNA Shared Debit AID</td>
</tr>
<tr>
<td>Union Pay</td>
</tr>
<tr>
<td>Union Pay Common Debit AID</td>
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Routing Options When Using a U.S. Common Debit AID

When a U.S. Common Debit AID is selected, the transaction can be routed to any network the issuer has enabled for that card:

- The associated global payment network, or
- A U.S. domestic payment network
Routing Options When Using the DNA Shared Debit AID

– When the Shared Debit AID from the DNA is selected, the transaction can be routed to any domestic payment network with the DNA Shared Debit AID.
EMV Chip Transaction: Authorization Request

– Chip card at chip-enabled terminal

1. Card and terminal interact
2. Visa U.S. Common Debit AID selected
3. Card generates EMV data, including Authorization Request Cryptogram (ARQC)

Merchant or Acquiring Processor

Visa Network

U.S. Debit Network

Issuer or Issuer Processor

5. Issuer verifies EMV data and makes authorization decision
EMV Chip Transaction: Authorization Response

– Chip card at chip-enabled terminal
Testing and Certification

- U.S. Common Debit AID and DNA Shared Debit AID
- Issuers
- Terminal owners/acquirers
- Check with your payment network representatives to obtain their specific requirements and updated certification test plans
Resources and References

• EMV Specifications
  – www.emvco.com

• Dodd-Frank Wall Street Reform and Consumer Protection Act and the Durbin Amendment

• U.S. Payments Forum
  – Debit Technical Proposal
    • www.emv-connection.com/u-s-debit-emv-technical-proposal/
  – Minimum EMV Chip Card and Terminal Requirements – U.S.
    • http://www.uspaymentsforum.org/minimum-emv-chip-card-and-terminal-requirements-u-s/
  – Implementing EMV at the ATM, Appendix A (Transaction Scenarios involving U.S. Common Debit AIDs)
    • www.emv-connection.com/implementing-emv-at-the-atm-requirements-and-recommendations-for-the-u-s-atm-community/

• Debit Network Alliance white papers
Project Team

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Thank you!