EMV® Migration Forum

Testing Best Practices

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Agenda

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- Process Improvements – EMVCo TITF Initiative
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- EMV Certification Process – Innovative New Approach
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Introduction

- All Payment Brands have acquirer host (already completed by Acquirers) and EMV terminal integration testing processes to maintain the integrity of the Payment Brand infrastructure and a frictionless cardholder acceptance experience.
- These testing requirements are global and adopted in the U.S. to reduce interoperability issues in production.
- These processes follow EMV requirements (the industry standard) and each Payment Brands specifications, but also aim to ensure interoperability between host systems, payment devices, and cardholder devices.
- By benefitting from global knowledge and experience, the Payment Brands have developed and improved these testing processes while maintaining the balance of when to test to minimize risk of deployment issues in production.

Certification Test Requirements
(Payment Brand Outline)

Terminal Integration Testing

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Terminal Integration Testing

- This section outlines the EMV chip process for completing the required terminal testing for the various Payment Brands.
- "Terminals" means all EMV-related terminal types, including POS devices, ATMs, bank branches, unattended devices, and on-board terminals.
- Terminal testing is the responsibility of the acquirer.
- Required terminal testing does not focus solely on the terminal; it examines anything that sits between the card and the Payment Brand.
- Figure 2 illustrates what areas are covered by terminal testing.

Terminal Integration Testing

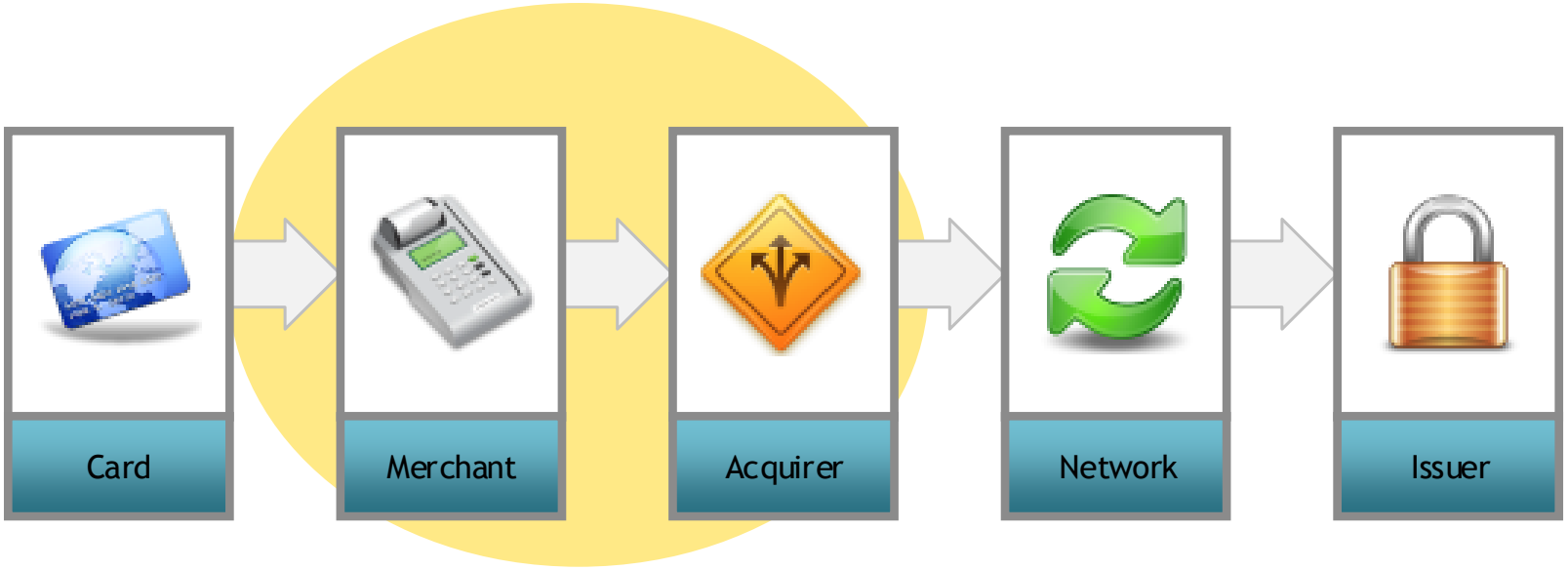
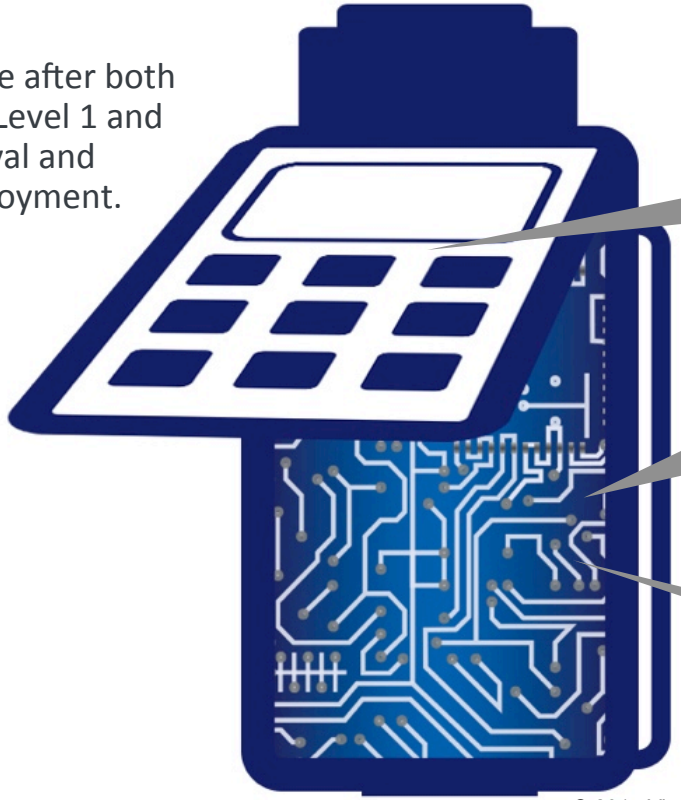


Figure 2: Areas covered by Terminal Testing

Terminal Integration – When is Testing Required

New or change to Terminal hardware and software

Payment Brand testing requirements take place after both EMVCo Type Approval Level 1 and Level 2 terminal approval and precedes terminal deployment.



Hardware
(including peripheral equipment and pin pad add on)

Software - Authorization
(CVMs, introduction of cashback or dynamic currency conversion)

Software
(EMV Kernel)

Currently, Payment Brand terminal testing is required any time there are changes to chip processing on the terminal or within its infrastructure.

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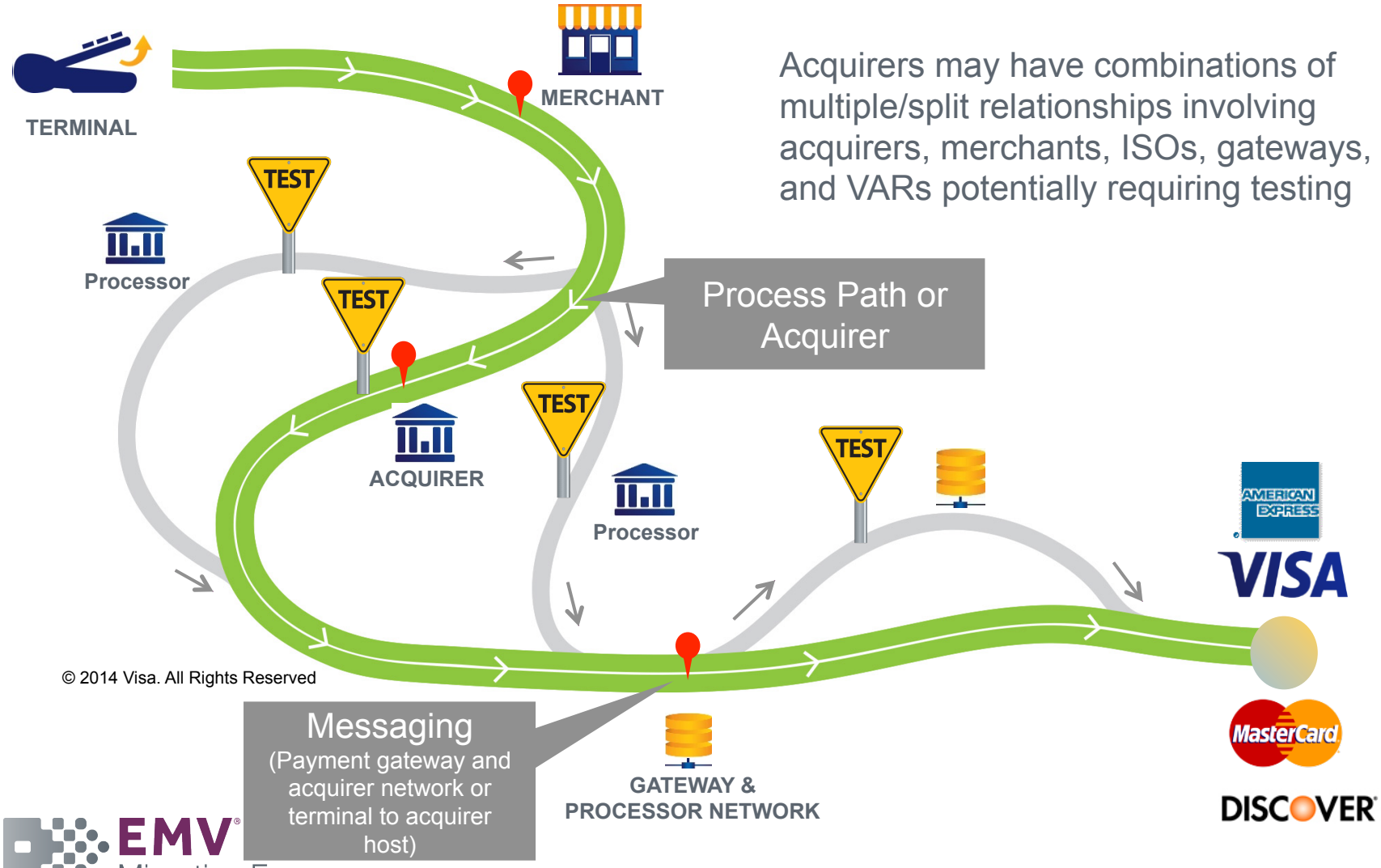
Terminal Integration – When is Testing Required

New or Change to Acquirer, Gateway & Processor Paths



Acquirers may have combinations of multiple/split relationships involving acquirers, merchants, ISOs, gateways, and VARs potentially requiring testing

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Terminal Integration Testing

- Ensures terminals properly integrated into EMV environment.
- Process Guidelines are published by the Payment Brands.
- Test Plans for each Payment Brand outline test case coverage.
- Test Plans updated to take account of new conditions to be checked/verified with obsolete test cases removed.
- Qualified Test Tools must be used to perform the tests.
- These qualified tools have been developed / enhanced over the years featuring extensive automation for maximum efficiency
- Lists of Qualified Test Tools are published.
- Testing is performed once on any unique terminal combination of EMVCo Level 2 kernel, payment application and Transaction Path.
- Appendix has further details for each Payment Brand.

Terminal Integration Testing - Typical Process Steps

- Requirements Capture and Validation
- Generate Test Lists
- Prepare for Accreditation
- Perform Accreditation Tests
- Obtain Formal Accreditation from the Payment Brand

Payment Brand Reference Information

The following links provide additional reference material on EMV testing and certification. Note the Payment Brands' sites require registration and login.

American Express

- American Express technical specification web site, www.americanexpress.com/merchantspecs

Discover

- Contact your assigned Discover representative.

EMF

- EMV T&C White Paper: Current U.S. Payment Brand Requirements for Acquiring Community http://www.emv-connection.com/emv-testing-and-certification-acquiring-community-white-paper/

EMVCo

- EMVCo web site, http://www.emvco.com
- EMVCo Approvals and Certifications, http://www.emvco.com/approvals.aspx

MasterCard

- MasterCard Connect web site, https://www.mastercardconnect.com/

Visa

- Visa Online web site for Visa clients, https://www.visaonline.com
- Visa Technology Partner web site for vendors, https://technologypartner.visa.com/

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EMV Certification Process

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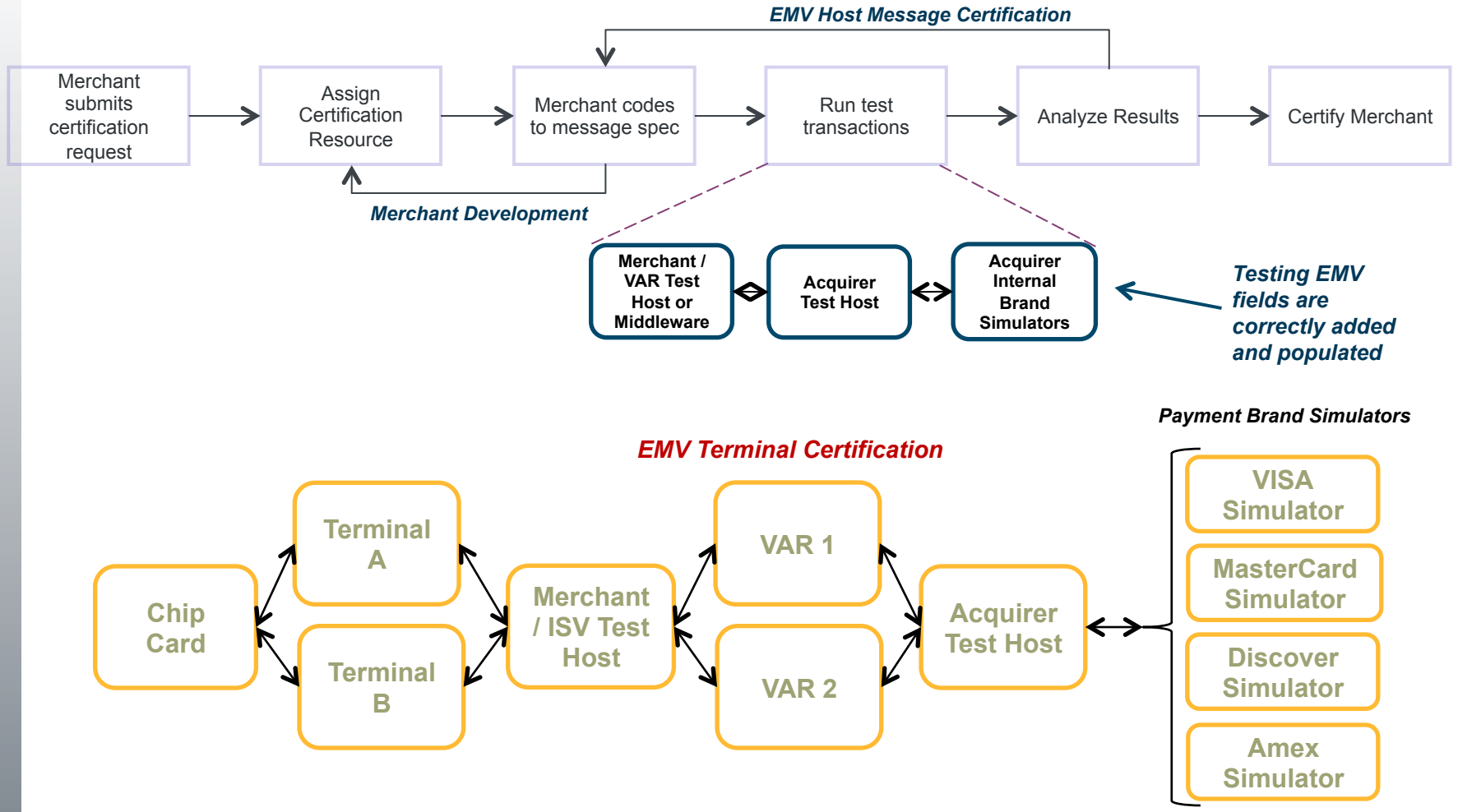
EMV Certification Process



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EMV Certification Process – Payment Brand Tool Kits

- American Express
  - American Express ICC Payment Specification (AEIPS)
  - Expresspay Contactless Specification
- Discover
  - D-PAS Acquirer-Terminal End-to-End (E2E)
- MasterCard
  - MasterCard Terminal Integration Process (M-TIP/ PayPass M-TIP)
- Visa
  - Acquirer Device Validation Toolkit (ADVT)
  - Contactless Device Evaluation Toolkit (CDET)
  - quick Visa Smart Debit Credit Device Module (qVSDC DM)

Number of tests to be performed is dependent on the terminal type (ATM/POS) and features supported (CAM, CVM etc.)

EMV Certification Process – Test Phases

- Acquirer Host Message Testing
  - Merchant/ISV/VAR code to Acquirer message specification.
  - Typically 200-300 tests to be performed.
  - After completing, Acquirer Host Message Certification is scheduled with Acquirer followed by Terminal Integration testing with Acquirer.
- Terminal Integration Testing
  - Acquirer coordinates with Payment Brands.
  - Test Case Lists supplied by Acquirer to Merchant/ISV/VAR.
  - Merchant/ISV/VAR personnel run transactions sending results to Acquirer for submission to Payment Brands for Accreditation.

Qualified Test Tool Walkthrough

the recognised leader in EMV test tools and service provision

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Best Practices to ensure Greatest Efficiency

- Easy to follow installation and operation guides with tool.
- Test case lists generated by direct import into qualified tool.
- Operator instructions supplied on screen at each test stage.
- Test logs results automatically verified against pass / fail criteria giving real time information.
- Ability to generate test log formats required for accreditation.
- Ability to import host log(s) at end of test campaign automatically verified against pass / fail criteria.
- Ability to export test results and logs etc. for direct submission to Payment Brands in required formats.
- Standardise on common terminal configurations and transaction paths will enable deployment in multiple locations without needing to re-certify each time!

EMV Certification Process

– Innovative New Approach

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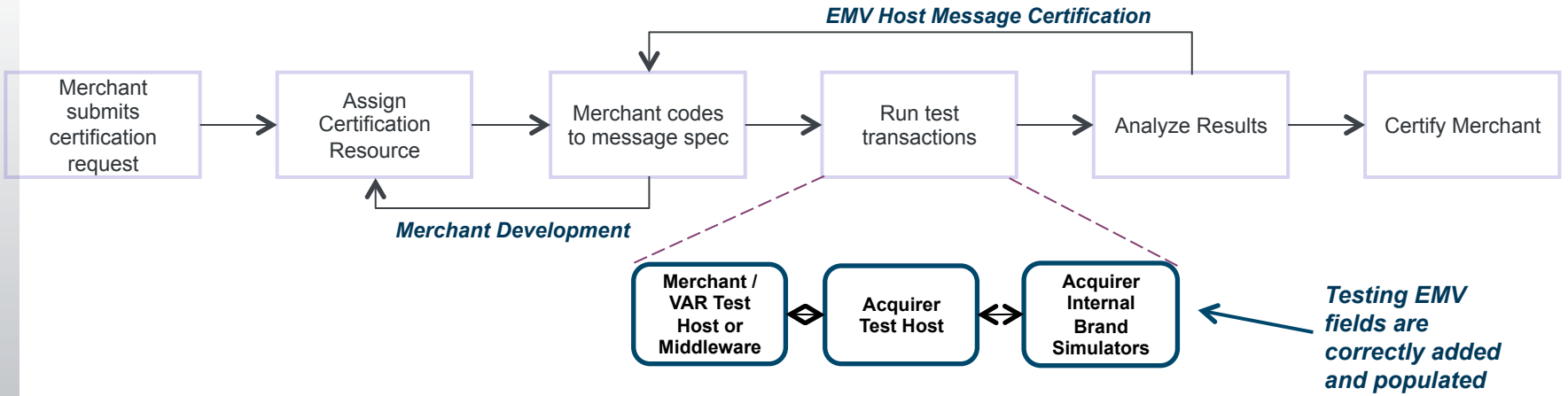
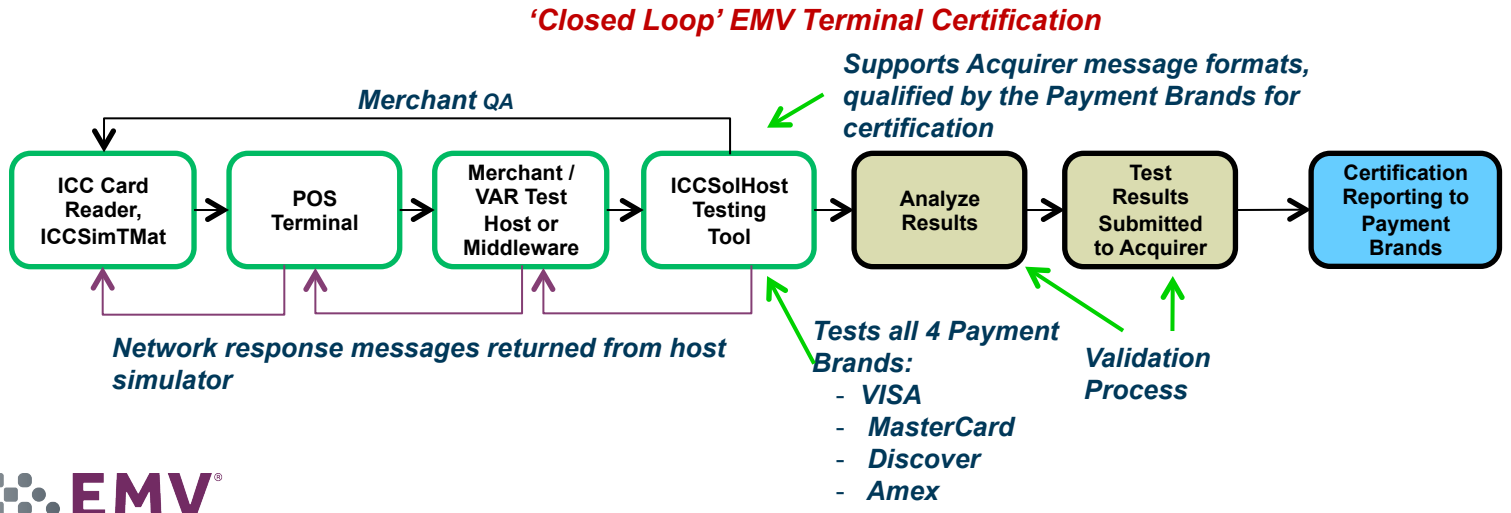
New Approach - Objectives

- Puts Merchant/ISV/VAR in control of certification process
- A self-certification program addresses the inefficiencies in the current EMV certification process:
  - *Reduces labour* requirement for ISVs/VARs
  - Process *is scalable*
  - ISV/VAR *controls* certification process
  - Payment Brand acceptance process is *not required*
  - Payment Brand escalation overhead *is removed*
  - Rigor of ISV/VAR host certification process *is leveraged*

EMV Certification Process - New Approach





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Benefits of a Closed-loop Testing Environment

- Merchant/ISV/VAR unattended testing with the qualified Toolkit.
- Merchant/ISV/VAR performs all Payment Brands testing requirements for all form factors (contact, contactless) using the qualified Toolkit.
- All Acquirer EMV acquiring host functionality is built into the Toolkit, representing the acquirer host interface.
- Payment Brand test requirements are built into the qualified Toolkit to ensure transaction establishment.
- Qualified Toolkit supplied to Merchant/ISV/VAR using distributed model.
- Current Merchant/ISV/VAR host cert process is leveraged with acquirer.
- This example implementation is available and in use TODAY.
- Merchants/ISVs/VARs benefiting TODAY from huge efficiency. savings!

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Industry Process Improvements

In progress

EMVCo TITF Initiative

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Background from EMVCo

- EMVCo continually aims to streamline and simplify processes.
- Terminal Integration Task Force (TITF) assigned to investigate the feasibility of establishing a single, consolidated EMV terminal integration process globally across payment organisations.
- Collaborated with the EMV Migration Forum Acquirer Subcommittee to ensure concerted effort.
- Review in progress to identify areas of opportunity for testing processes after EMVCo Level 1 and Level 2 terminal approvals.
- Determine the synergies across multiple payment organisations and agree on potential opportunities where consolidated processes benefit all participants.

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Thank you!
Questions?

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Appendix

Payment Brand Terminal Test Processes (Additional Detail)

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MasterCard Terminal Testing

- The MasterCard terminal integration process (M-TIP) is MasterCard's process for testing terminals integrated into an EMV environment.
- Testing can only take place after valid NIV approval obtained.
- Testing is performed once on any combination of EMVCo Level 2 kernel and payment application that is intended to be deployed in the field.
- M-TIP projects can be initiated for a contact and/or contactless terminal.
- A MasterCard end-to-end demonstration (ETED) is required for initial chip migration for either ATM or POS.
- Documentation outlining M-TIP Requirements, Registration, Qualified Tools, Questionnaire, Test Execution, Service Providers & Self Approval available on MasterCard Connect.

Visa Terminal Test Requirements

- Visa developed the Acquirer Device Validation Toolkit (ADVT) and Contactless Device Evaluation Toolkit (CDET) to provide a separate set of test cards and test cases for EMV contact chip and contactless acceptance validation.
- Toolkits are used to validate correct terminal configuration, assist with integration testing, and ensure that Visa's terminal requirements are met before terminals are deployed.
- The quick Visa Smart Debit Credit Device Module (qVSDC DM) was developed both to address specific product approval self-testing requirements and deployment of standalone Visa payWave contactless readers compliant with Visa Contactless Payment Specification (VCPS) and support quick Visa Smart Debit and Credit (qVSDC).
- The test results are submitted to Visa via the Chip Compliance Reporting Tool (CCRT).
- The Chip Vendor Enabled Service (CVES) engages third-party chip tool vendors to execute mandatory ADVT and CDET testing on behalf of acquirers, analyze results and submit reports to Visa.

Discover E2E Certification Testing

- Executing the D-PAS Acquirer-Terminal End-to-End (E2E) test ensures that acquirers demonstrate the following:
  - That the terminal accepts D-PAS products successfully.
  - That authorization requests and responses can be transmitted between a terminal, acquirer host, and the Discover network successfully.
  - That the terminal processes chip-based functions, including PIN support, fall-back transactions, and the card verification methods supported by the terminal.
- Full details of prerequisites (device type approval etc.), initiation documentation (certification request form, terminal data collection form etc.), test execution (qualified tools etc.), results (log submission etc.) and review process can be obtained by contacting the assigned Discover Account Executive.

American Express End-to-End Certification

- The American Express POS device certification process is designed to test end-to-end processing of American Express chip card transactions from the POS device, through an acquirer/acquirer processor or merchant network, to the entry point on the American Express network.
- Testing includes chip card/POS device interoperability, and the acquirer/acquirer processor's or merchant's capability to capture, format, and transmit required data, involving contact and/or contactless capabilities.
- POS device specifications are detailed in the American Express ICC Payment (contact) Specification (AEIPS), and the Expresspay (contactless) Specification documents.
- Certification requirements, process steps (certification resource assigned to project) and pre-requisites are available by contacting your American Express representative.