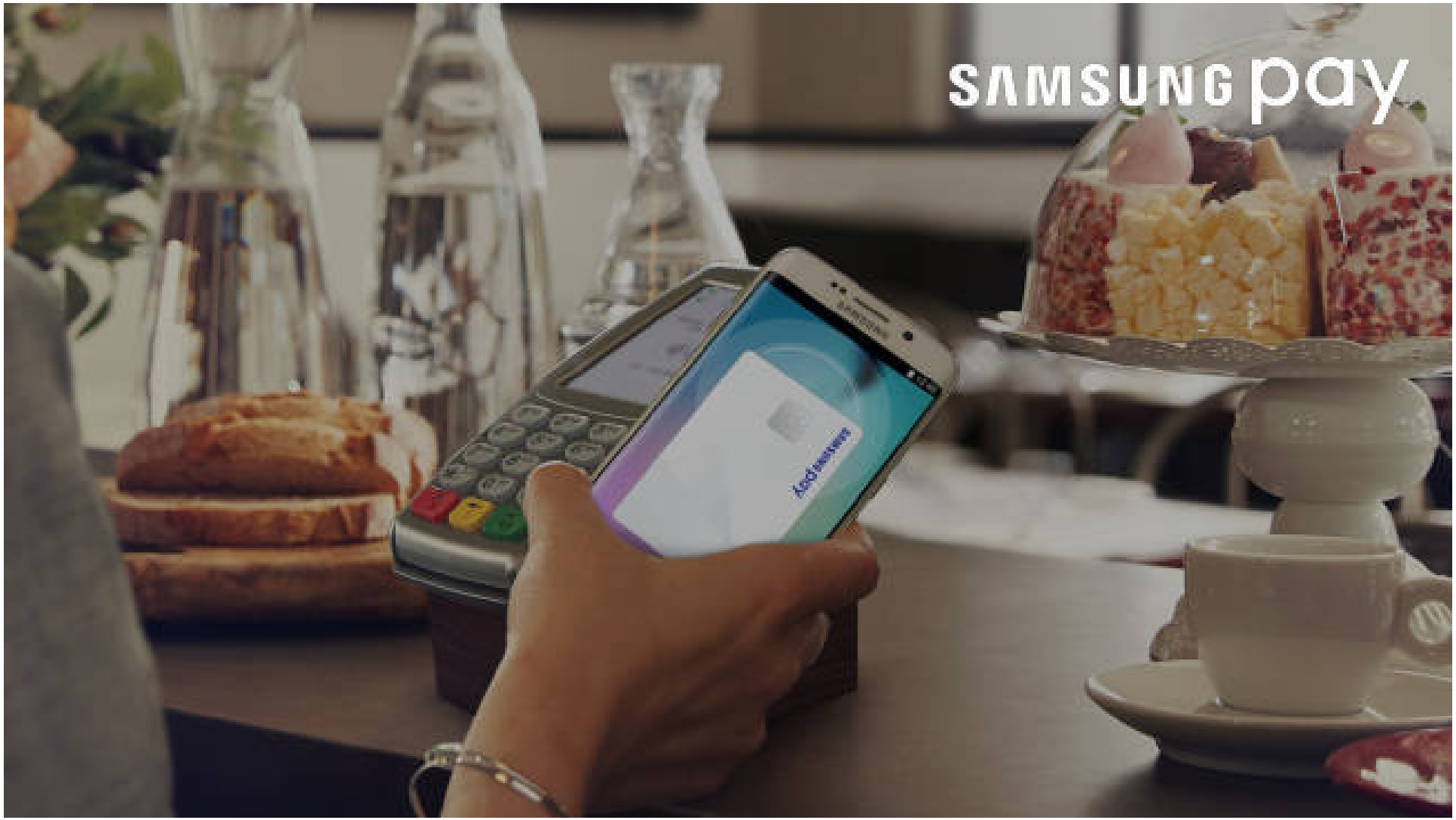
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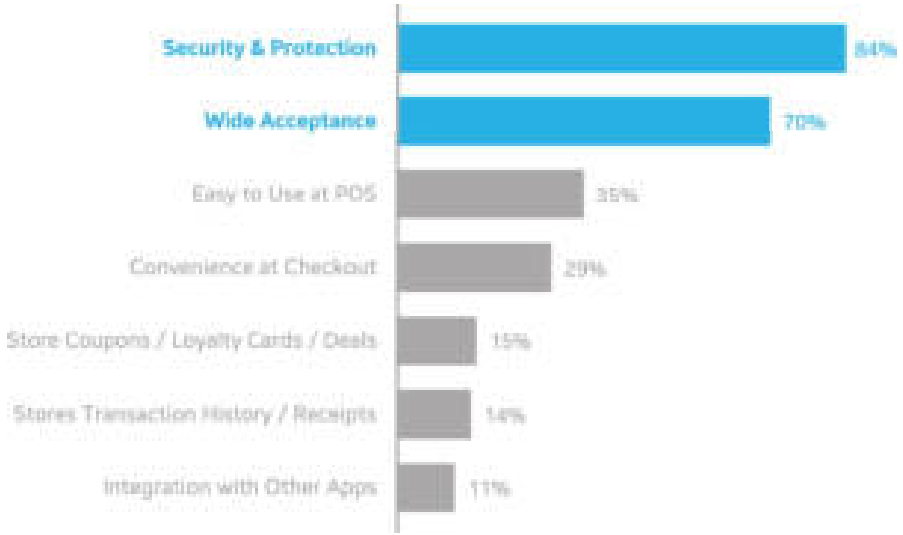
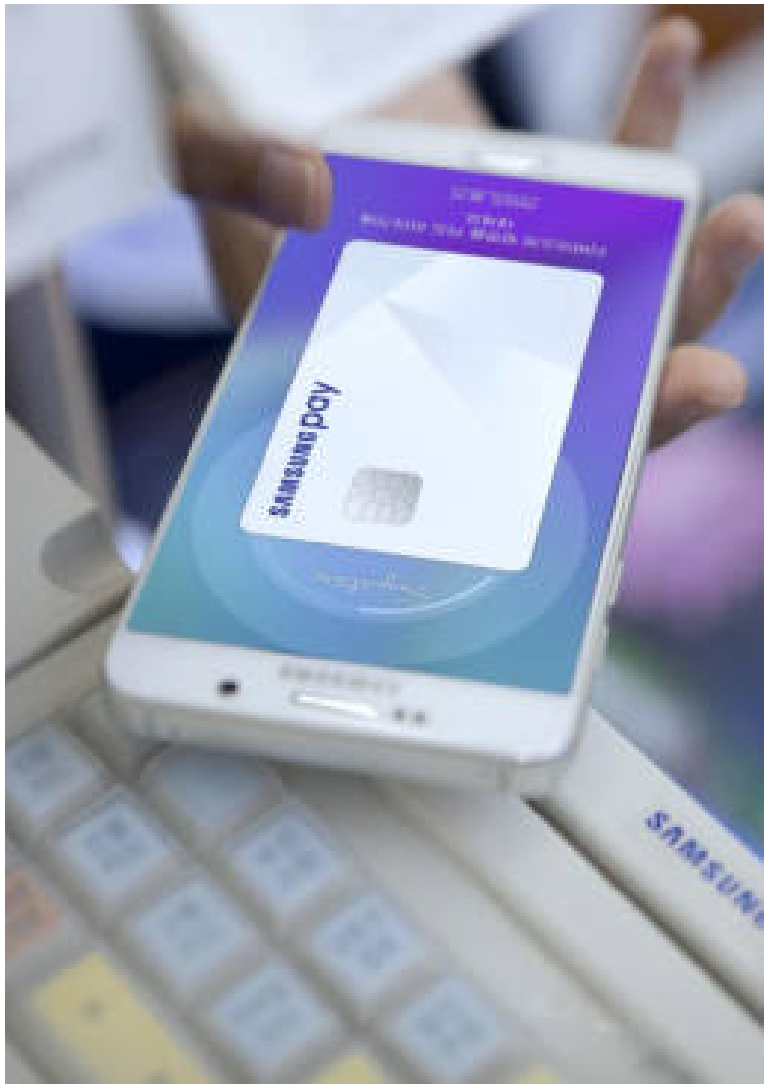
M-Payment Scenario

Most important factors to the end-user in a mobile payment app



* The data above is based on market research conducted by Samsung



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M-Payment Scenario

Wide acceptance is the biggest barrier of adopting m-payments across solutions

* The data above is based on market research conducted by Samsung.

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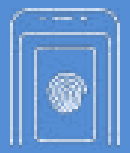
Safe and secure mobile payments

available virtually anywhere you can use your card.

Everywhere

Secure



Simple

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Everywhere – Widely Accepted

Works almost everywhere cards are accepted

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Secure - Device

Designed with our highest level of security available.

User Authentication

Samsung KNOX

TrustZone

SAMSUNG pay

Secure - Data

Designed with our highest level of security available.

Tokenization

Personal Data Protection

Remote Wipe

PII = Personal Identifiable Information

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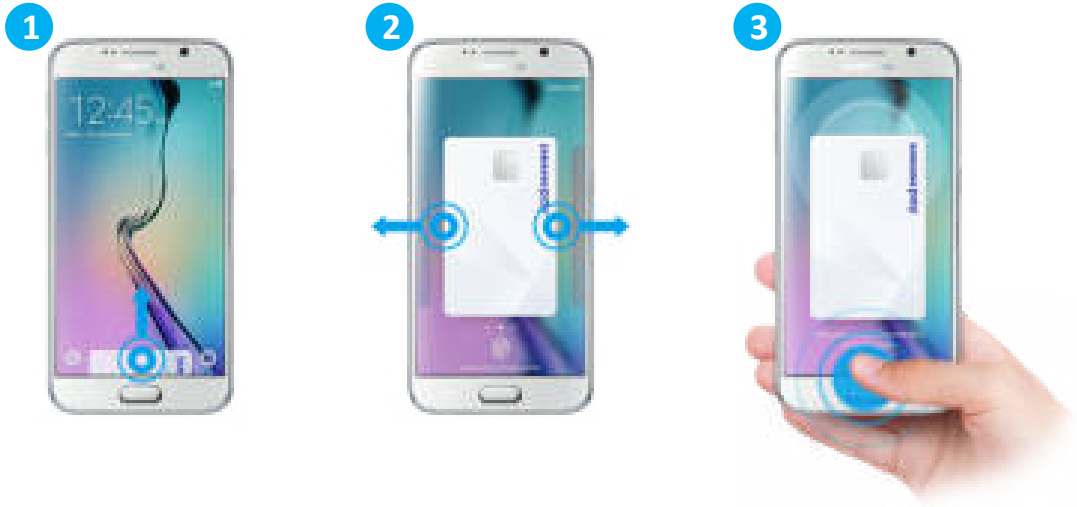
Simple

Designed to make paying with your phone fast, easy, and convenient.



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Eligible Devices

A510 & A520

A710 & A720

A910

G920* & G925*

G928

G930 & G935

N920

G950 & G955

* NFC only

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Partners - Launched

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Partners - Coming Soon

Market comparison

Software provider	Monetization	Safety	Offline (in-store) Range	Online (in-app/ e-commerce) Range	Consumer base Potential	Expansion Potential
Samsung Pay	No ISSUER transaction fee	TEE; Attestation; Finger Print; Token; Knox	NFC; MST		Premium → Premium + Mid Q2'17	
Apple Pay	ISSUER Transaction fee	TEE; Finger Print; Token	NFC		Premium	
Android Pay	No ISSUER transaction fee	HCE; Token	NFC		Android Users	
PayPal / Paysafecard	Transaction Fees		None		All	

Value Added Services

Issuer Apps Integration

Allows user to open issuer's bank application from Samsung Pay and also app-to-app ID&V

Membership and PLCC

Allows users to include personal (insurance, health care, etc), membership, PLCC and co-branded *cards*

Digital Promotions

Partner's promotion, push-notifications and geofence campaigns

Smartwatch

Payments thought Samsung Gear smartwatch

Transit

Include transportation cards to be used on subways, trains and buses

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Thank you!
Obrigado
감사합니다

Appendix

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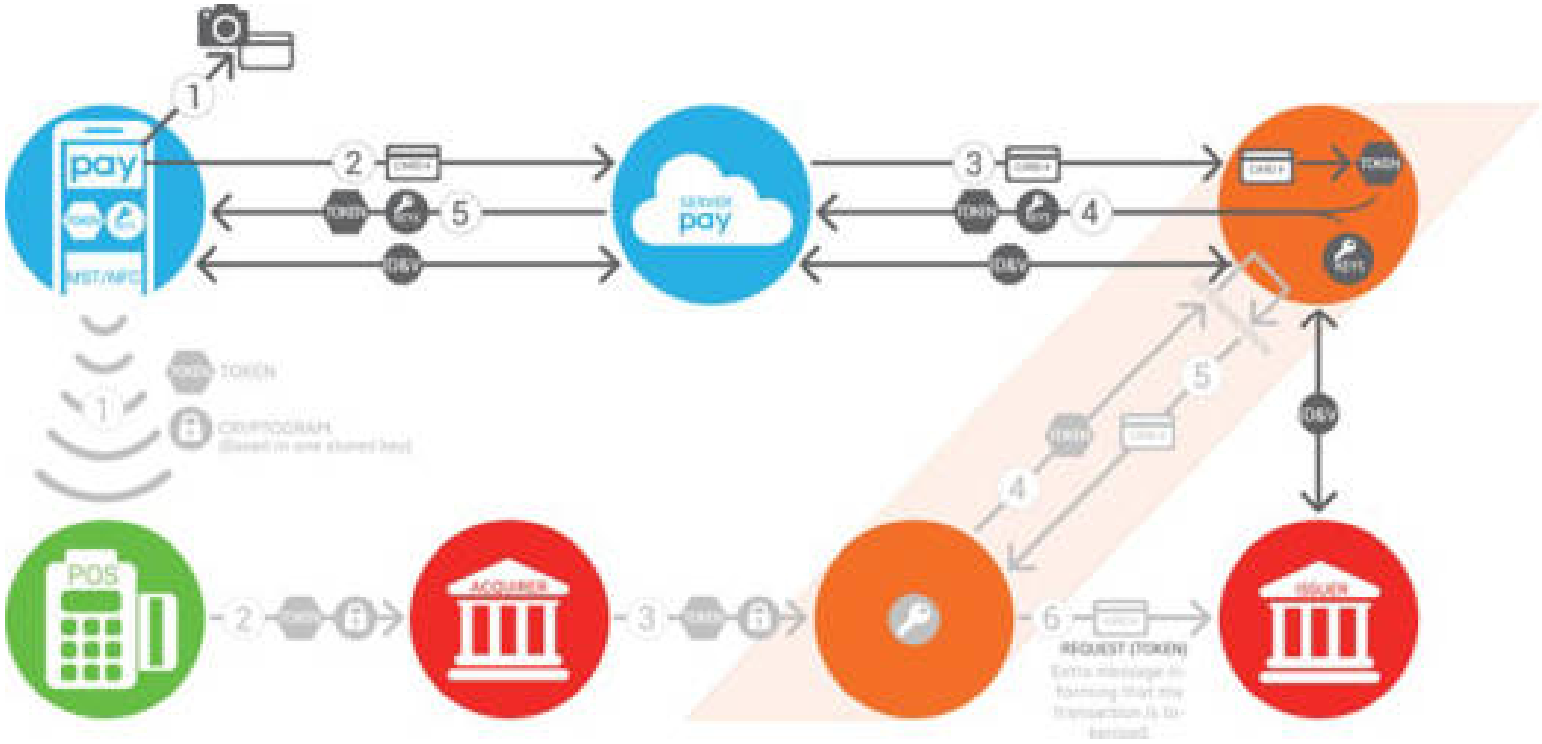
Process Overview



System Overview

Card Provisioning Mechanics

Sign-up

- User signs up for Samsung Pay using their Samsung Account.
- Card information is immediately encrypted and securely sent to the appropriate credit card network.

Tokenization

- Upon determining card validity, account info and device integrity, Network & Issuer send a **Token** to device.
- Token is stored in Trusted Execution Environment on the device, leveraging Samsung KNOX's Architecture.
- The Token (known as the Digital Card Number) is used in place of an actual credit card number.

Policy

- No Credit Card Information is stored on our devices or servers.

Payment Mechanics

Security Methodology

- At time of transaction, Samsung Pay sends Token and Cryptogram to the merchant POS.
- At the same time, the incremented ATC (in the discretionary field) is sent to prevent replay attacks.
- Cryptogram is effectively a *one-time use* digital signature or Verification Value (Visa) or Checksum (MC) that verifies the cryptogram from device with the one generated by TSP in the cloud.

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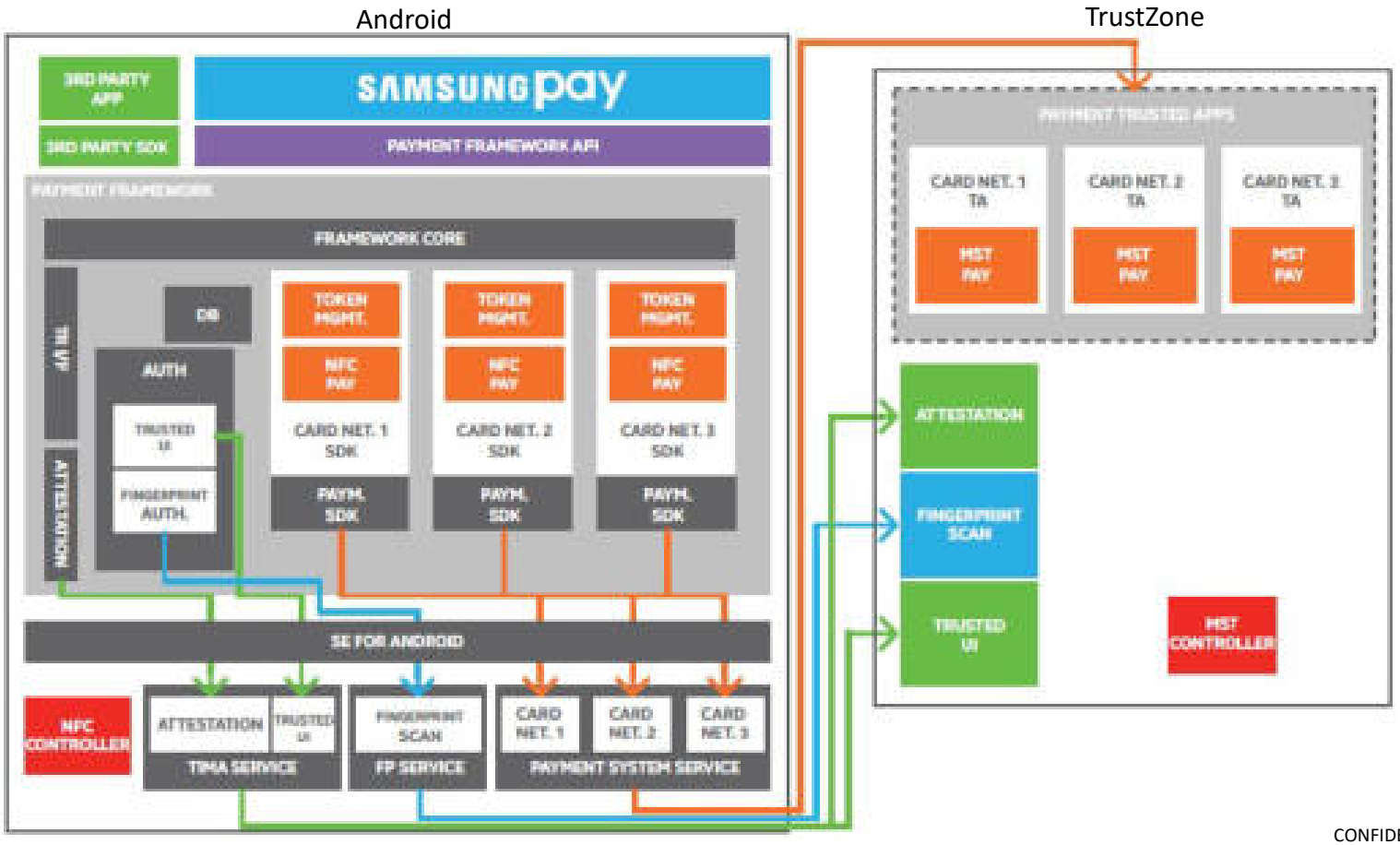
Trusted Execution Environment



Multiple Layers of Security

Cardholder protection

- Implemented ID&V process in cooperation with card issuers' best practices to prevent fraud during enrollment

Tokenization

- Token and keys provisioned to device

TEE-based security for device and data at rest

- Card data and keys protected by hardware based keys
- Trusted Application for each card network; handles crypto logic; assists in implementing public-key cryptography and more
- Trusted PIN pad and fingerprint authentication directly against TEE
- System integrity check via Secure Boot, Trusted boot and remote attestation, Verification of Trusted App and Mandatory Access Control

End-to-end encryption for data in transit

- Secure communication channel between card network trusted app in TEE and TSP with mutual authentication and end-to-end encryption
- Card data in transit not visible to Samsung servers

Remote management

- Manage lost of stolen phones using Samsung's Find My Mobile
- Issuers can remotely suspend or delete cards enrolled in Samsung Pay

KNOX and Four Pillars of Security

TrustZone – H/W based cryptographic keys
TUI – Trusted User Interface / Trusted PIN
Trust Zone Application Sand Boxing – Apps are isolated from each other
Trusted Boot – Boot Loaders & Kernel are measured before executed
TIMA Attestation – Device providers remote server software integrity check
Kernel Protection – Real Time Kernel Protection

Security against authorized account access in HCE with KNOX depends on four key concepts:

1. Limited use keys – Expire quickly preventing misuse, requires replenish.
2. Tokenization - Tokens reduce risk by replacing the PAN with limited use data.
3. Device Profiles (Fingerprinting/PIN) – validate user at time of transaction.
4. Dynamic risk analysis -user/device/account data is used to perform risk assessment for the transaction in real-time through the client app, MAP, and issuer backend.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Homologation Process

Homologation Process

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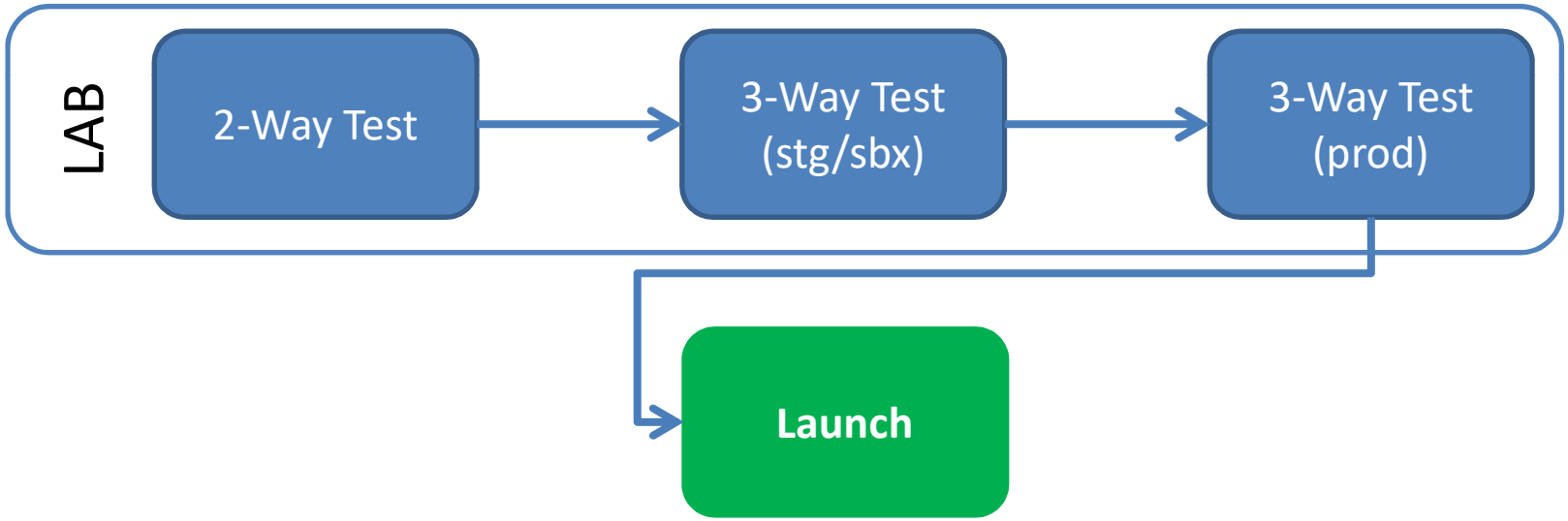
For each card type (debit/credit/combo) this is the process to homologate a new Issuer:



2-Way Tests

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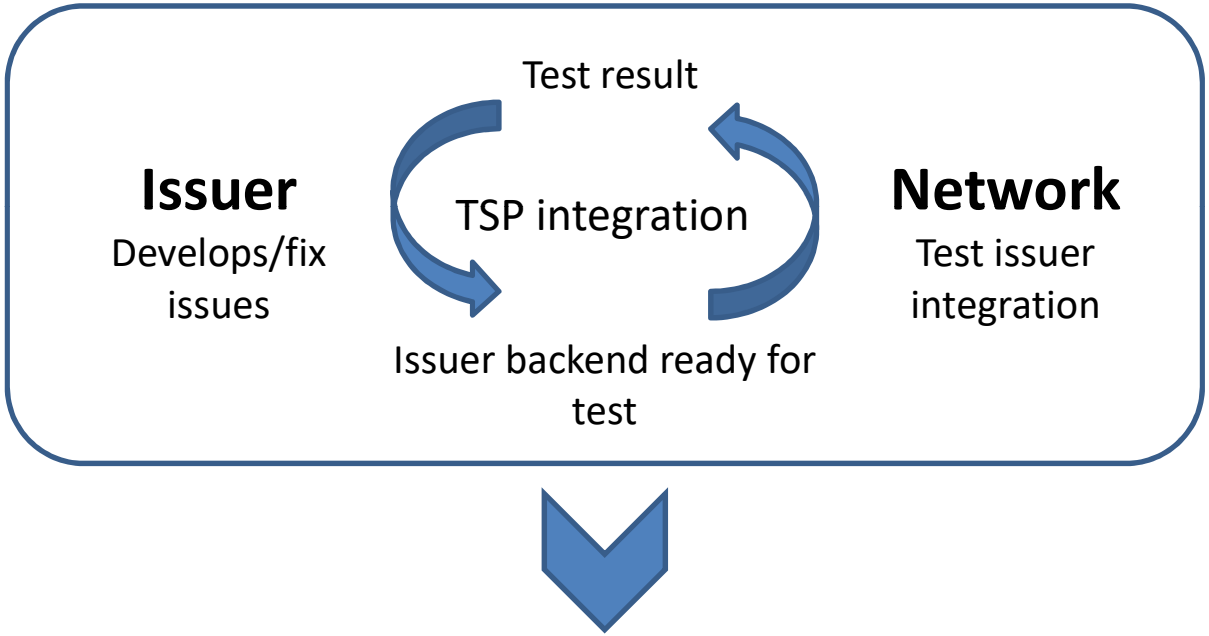
- Issuer integration with Network TSP



Cycle is repeated until NW approves issuer implementation

3-Way Tests (Stg/Sbx)

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- Samsung QA team verifies in stg/sbx environment SSPay integration with issuer and network
  - 3-way agreement to go stage test (Issuer + Network + Samsung)
  - Controlled 3-way E2E
  - All parties pointing to Network stg/sbx server
- Samsung needs eligible test PANs (one per card type)
  - PANs for stg/sbx environment
- Apk for stg/sbx environment
- Tests executed by Samsung
  - Issuer and Network participate during execution

3-Way Tests (Stg/Sbx)

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- Who participates:
  - Issuer: verifies logs, checks result of tests and control LCM portal
  - Network: verifies logs and control LCM portal (if issuer does not have access)
  - Samsung Tester: test execution

3-Way Tests (Stg/Sbx) – Test Cases

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- Provisioning – Enrollment
  - Green/yellow/red paths, card-art, T&C, CS information
- Id&V
  - Call center, SMS, A2A - options available on test environment
- LCM (Life Cycle Management) – Issuer initiated
  - Token states (activate, replenish, suspend, resume, deactivate)

3-Way Tests (Prod)

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- Samsung QA team verifies in prod environment SSPay integration with issuer and network
  - Issuer server goes live
  - Card Network prod
  - Live controlled 3-way
  - Real transaction/real money – prod POS
- Samsung needs eligible PANs (one per card type)
  - PANs for prod environment
  - PANs whitelisted
- Apk for prod environment
- Tests executed by Samsung
  - Issuer and Network participate during execution

3-Way Tests (Prod) – Test Cases

SAMSUNG pay

- Provisioning – Enrollment
  - Green/yellow/red paths, card-art, T&C, CS information
- Id&V
  - Call center, SMS, A2A - all options configured
- LCM (Life Cycle Management) – Issuer initiated
  - Token states (activate, replenish, suspend, resume, deactivate)
- LCM (Life Cycle Management) – User initiated
  - Find my mobile portal
- Transactions
  - MST, NFC, settlement, PIN, notification, cancel, installment, dummy CVV