SECURE TECHNOLOGY ALLIANCE

Dynamic Security Codes: A Primer

Secure Technology Alliance Payments Council

Mar. 23, 2021

Who We Are

The Secure Technology Alliance is a not-for-profit, multi-industry association working to stimulate the understanding, adoption and widespread application of secure solutions.

We provide, in a collaborative, member-driven environment, education and information on how smart cards, embedded chip technology, and related hardware and software can be adopted across all markets in the United States.

What We Do

- Bring together stakeholders to effectively collaborate on promoting secure solutions technology and addressing industry challenges
- Publish white papers, webinars, workshops, newsletters, position papers and web content
- Create conferences and events that focus on specific markets and technology
- Offer education programs, training and industry certifications
- Provide networking opportunities for professionals to share ideas and knowledge
- Produce strong industry communications through public relations, web resources and social media

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Our Focus

- Access Control
- Authentication
- Healthcare
- Identity Management
- Internet of Things
- Mobile
- Payments
- Transportation

Member Benefits

- Certification
- Council Participation
- Education
- Industry Outreach
- Networking
- Technology Trends

Payments Council

… focuses on **securing payments and payment applications** in the U.S. through industry dialogue, commentary on standards and specifications, technical guidance, **and educational programs** about the means of improving the security of the payments infrastructure and enhancing the payments experience.

SELECTED COUNCIL RESOURCES

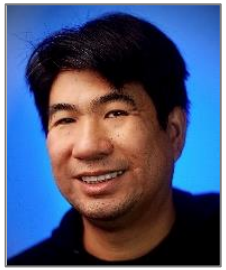
- Biometric Payment Card
- Contactless Payments: Proposed Implementation Recommendations
- Contactless Payments Security Q&A
- Dynamic Security Code Cards: A Primer
- Electric Vehicle Charging Open Payment Framework with ISO 15118
- EMVCo Payment Account Reference (PAR): A Primer
- Implementation Considerations for Contactless Payment-Enabled Wearables
- IoT and Payments: Current Market Landscape
- Blockchain and Smart Card Technology

Webinar Topics and Speakers

Francine Dubois
IDEMIA

Cyril Lalo
Ellipse

Oliver Manahan
Infineon Technologies



Gerry Glindro
IDEMIA

Tom Rapkoch
Visa

1. **Introduction**
2. **Benefits of Dynamic Security Code Cards**
3. **Issuer perspective**
4. **Stakeholder implementation considerations**

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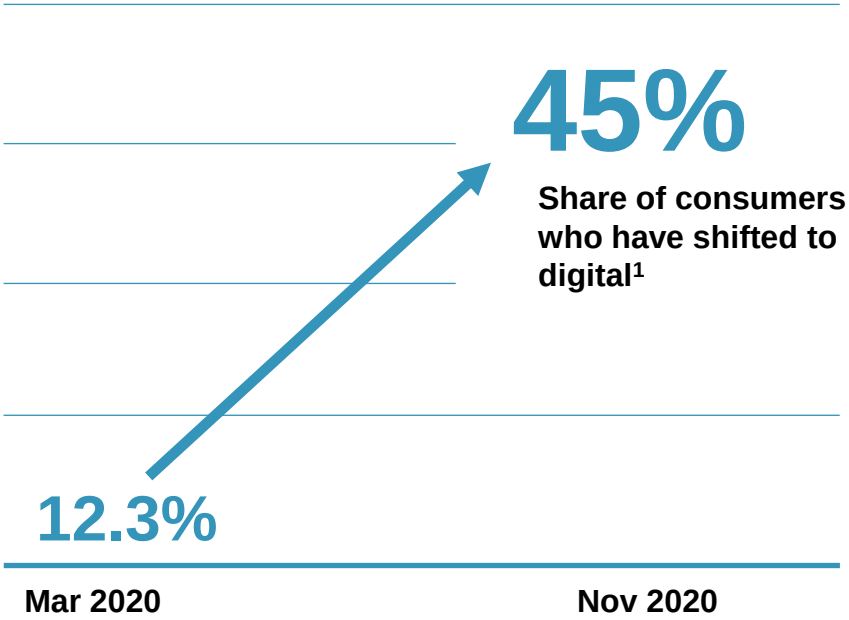
Introduction

Francine Dubois, IDEMIA

The Shift to Digital Commerce Is Here to Stay



79%

of consumers plan to continue the **digital shopping practices** they adopted during the pandemic[1]

+42% North America digital transactions from June 2019 to June 2020[2]

2020 CNP fraud **x2**[3]

1. PYMTS.com, Online security and the DEBIT-CREDIT divide, January 2021
2. CNP Newsletter, February 11, 2021
3. Robert Tharle, Fraud Prevention, November 21, 2020

CNP Fraud and COVID

- **Opportunistic fraud tied to Pandemic**
  - Fraudulent e-commerce shops set up to steal card data with CVV
  - Bot and “carding” attacks increasing. Fraudsters deploy bots to make small purchases to identify valid cards, followed by more frequent higher value transactions.
    Target = vulnerable merchants with less robust fraud systems like small to medium eCom businesses, QSRs or charitable websites
  - Huge increase in click and collect or Buy Online, Pickup In-Store (BOPIS) which helps fraudsters evade robust in-store EMV defenses and gain access to goods the same day with compromised credentials[1]

- **40 million cards exposed in 2020** (50% issued in the US) and a corresponding 20% YoY increase from 2019. Similarly, demand for CNP records rose in 2020 with a 20% YoY increase[2]

1. FIS, Early indicators of fraud trends emerging from COVID-19, July 13, 2020
2. Gemini, Annual Report 2020, December 17, 2020

False Positives/Declines

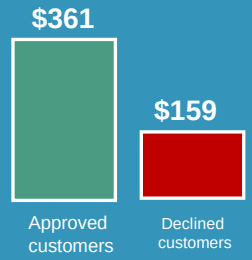
Legitimate purchase made with a valid payment card that is incorrectly rejected by the card issuer

- **Prevalence**
  - New shoppers 2x greater than pre-Covid and 5-7x more likely to get declined[1]
- **Impact on eMerchants**
  - 40% of declined users never come back to that site[1]
  - Millions in lost revenue[1]
- **Impact on Issuers**
  - Loss of market share to competitor
  - 68% Reduction in cardholder spend
  - Cost of customer support call, etc…
- **Impact on Consumers**
  - Frustration

25% of cardholders move a declined card to the **back of their wallet**[2]

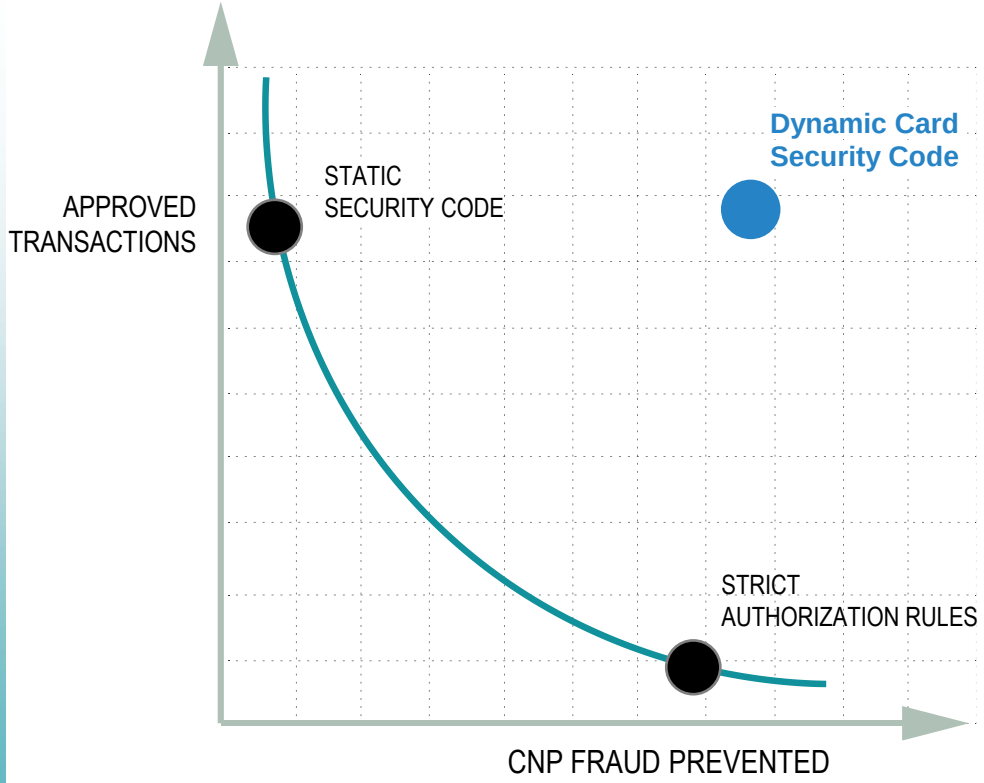
39% of cardholders change their **payment method** after a decline[3]

68% average spend reduction per order after a decline[4]



1. Forter "New User Missed opportunity"
2. Ethoca Research, "Solving the CNP False Decline Puzzle, Collaboration is Key" 2016. Referencing: *Javelin, Future Proofing Card Authorization, August 2015*
3. Ethoca Research, "Solving the CNP False Decline Puzzle," 2017.
4. Radial, False Positives White Paper, The monster that's really killing you and how to survive, 2018

The Need for New Solutions



The **right balance** between **security** & **transaction approval**

- **Increase in security**
  - Lower CNP fraud rate
  - Lower fraud management costs
  - Less card reissuance
- **Increase in revenue**
  - Less false positives & missed opportunities

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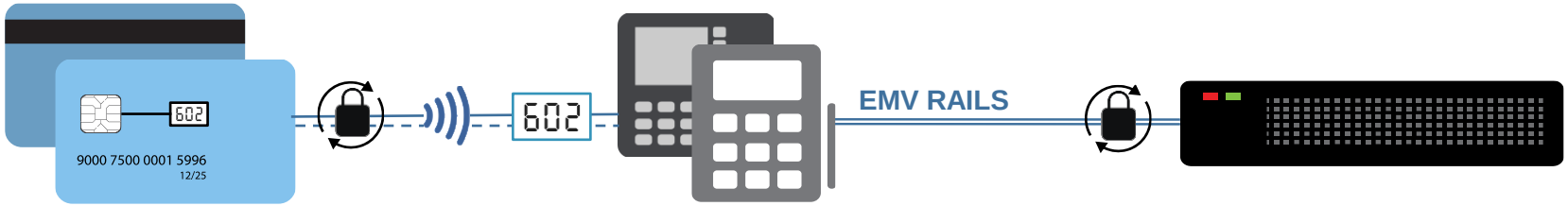
What Are Dynamic Security Code Cards?

Cyril Lalo, Ellipse

The Natural Evolution of Payment Cards

Extending the security enhancements of EMV to eCommerce



- Card & transaction data
- Contact EMV
  - Contactless
  - **DCVx2**

AE61266750D01
9063512516C7E
E01968012C81F
25A896A38517D
CD5A7E99FE264

- Authorization
- Authentication & synchronization
  - Speed & convenience
  - Dynamic Card Security Code for more secure CNP transactions

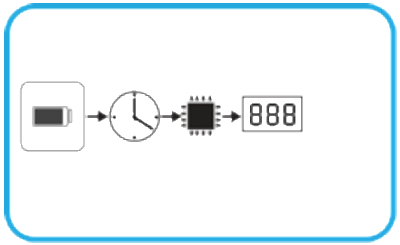
What Are Dynamic Security Code Cards?

Regular EMV Dual Interface payment card with embedded mini-screen

- **Electronic paper display**
- **Security code refreshes automatically**
  - Using a timer or
  - During every EMV transaction
- **Identical characteristics of regular payment card**

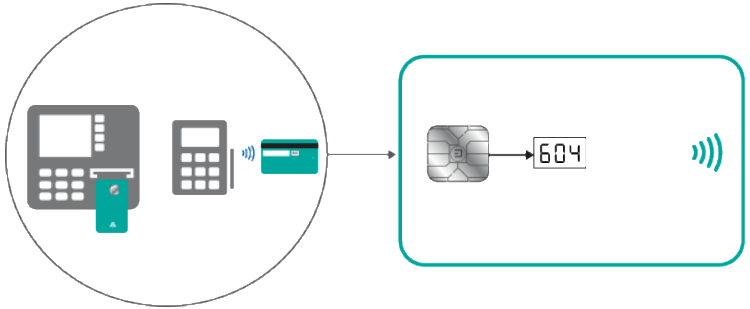
Dynamic Security Code cards – Overview

Time-based solution



- Code changes automatically, at set intervals
- Utilizes an internal real-time clock (RTC)
- Battery powered

EMV integrated solution



- New code generated natively by the EMV App during every EMV transaction
- Powered by terminal
  (POS, ATM, contact or contactless)

Dynamic Security Code Cards

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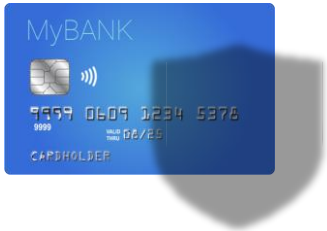
Benefits of Dynamic Security Code Cards

Oliver Manahan, Infineon Technologies

Increase in Security

Additional layer to other CNP fraud solutions

Combats fraud at the source



- Provides protection at the **card level**
- Deters card information theft

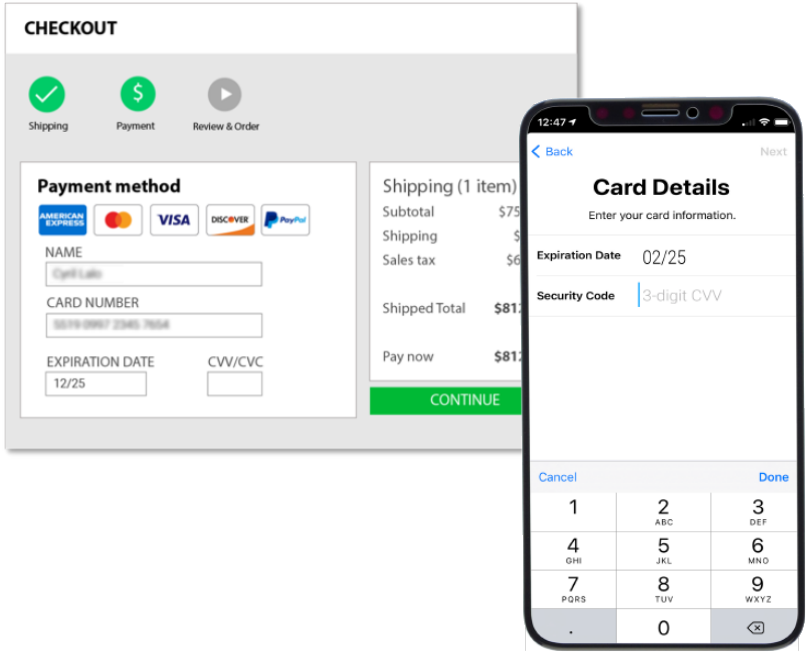
Addresses false positives

- Brings **issuer-controlled** dynamic data point to verification process
- Enables more accurate and reliable authorizations

Disrupts points of collection

- Provides date, time and place of origin for each DCVx2 *(EMV integrated)*
- Benefits all cards, including those with static security codes

Consumer Purchase Experience



Familiar & easy to use

- Used exactly the same way as regular static security codes
- Works on any channel
- Does not require additional apps or plugins
- Provides peace of mind

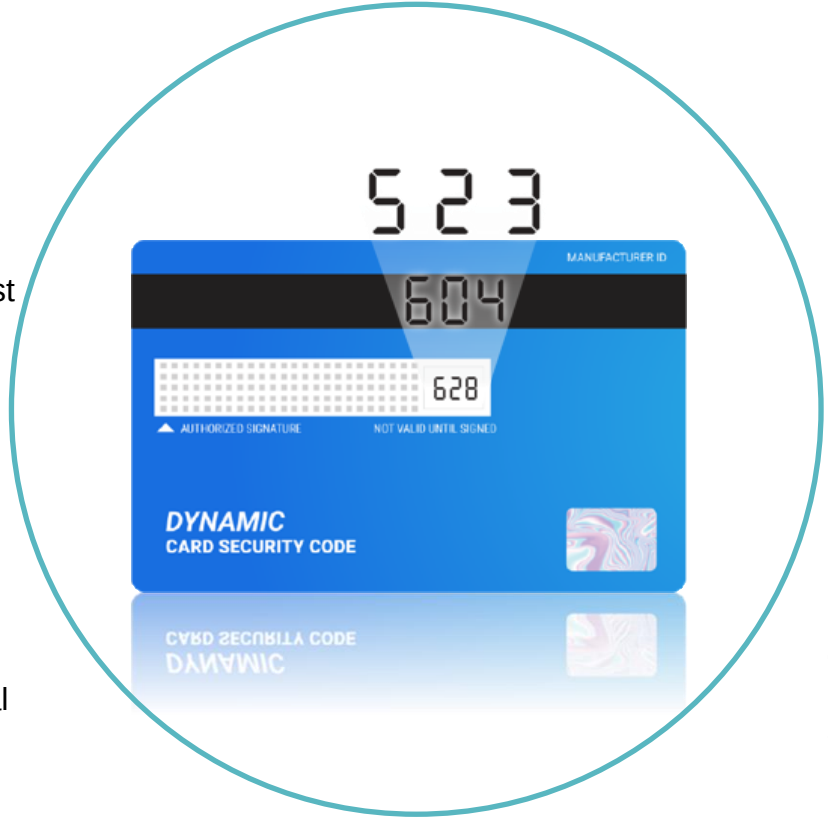
Transparent to Merchants

Transparent to eMerchants

- No additional action required to process dynamic security codes
- No impact on infrastructure, checkout page, and ordering systems
- Works on existing card not present channels

Issuer Advantages

Stronger card security
- Reduction of CNP fraud
- Lower fraud management cost
- Less card reissuance



Revenue increase
- New customer acquisition
- Value add service

Market differentiation
- Brings real consumer appeal
- Improve brand image

Improve cardholder trust and confidence

Top of wallet for in-person transactions, eCommerce, and eWallets

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Stakeholder Implementation Considerations

Gerry Glindro, IDEMIA

Tom Rapkoch, Visa

Implementation: Issuer

Time-based solution

Dynamic Security Code refresh frequency

Decisions on validation server

- In-house development/Off-the-shelf software
- Payment network service

Proper Card/battery disposal

EMV integrated solution

Educate users on regular POS transactions to refresh

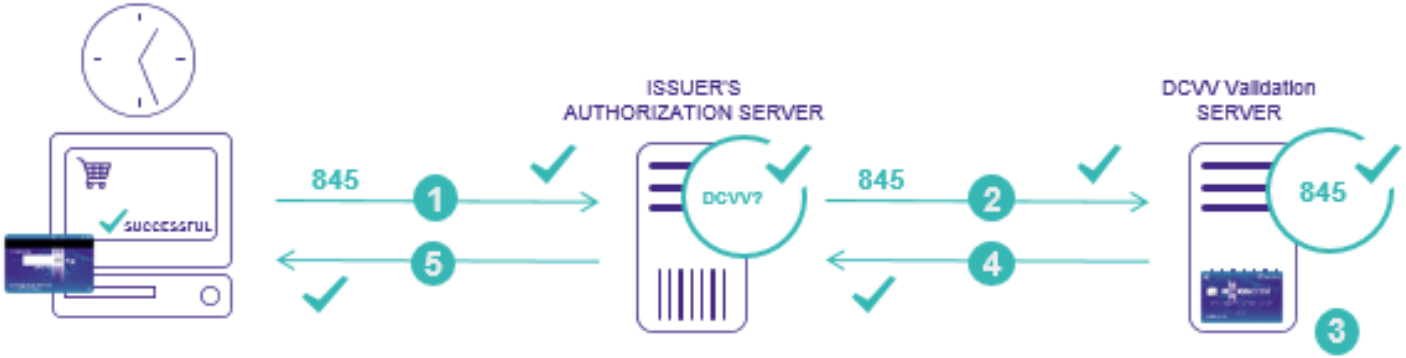
Implementation: Personalization Bureau

	Time-Based Solution 	EMV-Integrated Solution 
Personalization Timeframe	Some battery drain while in vault storage.	No change
Hardware	2nd contactless module required (ISO 154693)	No change
Personalization	EMV chip and display personalization	Regular EMV personalization
Certification	Payment network certification	Payment network certification
Time server	Synchronization with UTC time used with Verification Server	Not applicable
Perso Scrap	Proper removal of battery from scrapped cards	Not applicable
Fulfilment/packaging	Special fulfilment and special mailing packaging	Regular fulfilment and mailing
Visual inspection	Visual check – sufficient sampling size to ensure DSC refreshes tied to refresh period	Automated inline camera inspection during EMV personalization or visual check with card reader

Implementation: Issuer Processor

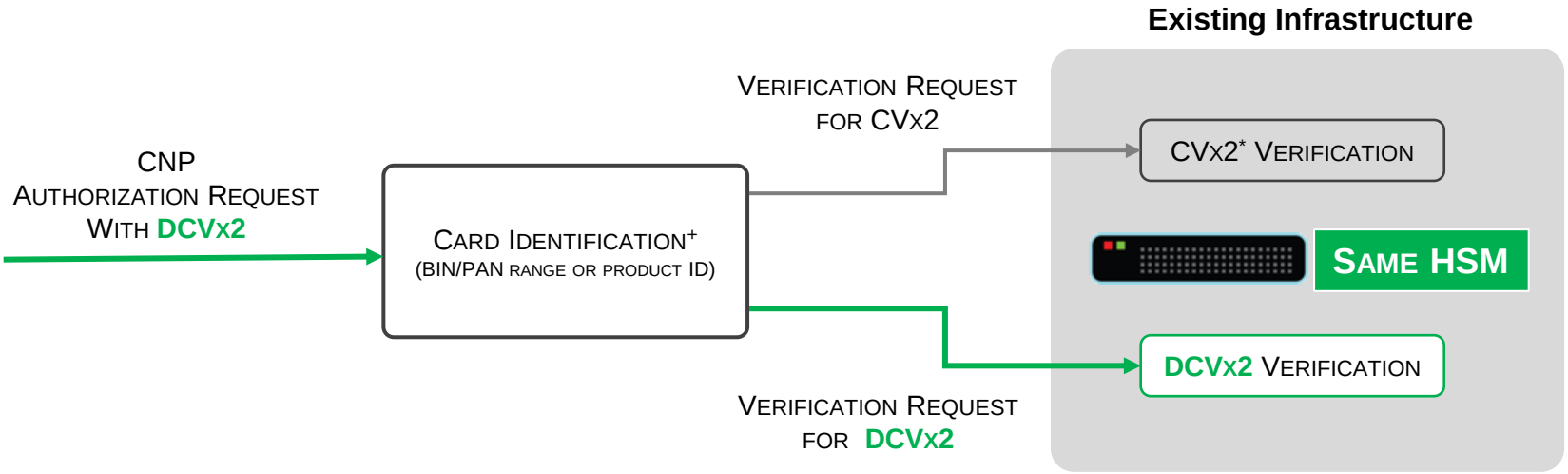
	Time-Based Solution 	EMV-Integrated Solution 
Change mechanism	Time based. Automatically updated at configured intervals.	Updated during a card-present EMV transaction.
Change frequency	The change interval is based on the issuer's risk policy and can range from 15 min. to 24 hrs.	The change interval is based on the frequency of card-present EMV transactions.
Clock management	Yes	Not Applicable
Infrastructure integration	Requires light integration	Leverages existing EMV infrastructure
Algorithms	OATH, Visa, others	Leverage algorithms available in current authorization platforms (i.e., algorithms used to generate static CVV or contactless magnetic stripe CVV)
Verification server	• Proprietary server software • Visa solutions	Leverages existing Issuer processor HSM

Implementation: Processor – Time Based



1. Card data (PAN, expiry date and DCVV Value) **sent "normally" via Payment Service Provider** up to the issuer's authorization server, just as a transaction with a "normal" card
2. Card is recognized as a Dynamic CVV by its PAN or BIN: as a result, **DCVV check is routed for validation towards the DCVV server**
3. **The DCVV server compares the DCVV Value submitted** with the one it calculates
4. **Result (Valid / Invalid) is routed back to the issuer' server**
5. **Transaction is approved/rejected**

Implementation: Processor – EMV Integrated



DCVx2 verification request replacing CVx2 verification request

+BIN/PAN range or product ID
*CVx2 = CVV2 (Visa) or CVC2 (Mastercard)

Implementation: Network

Time-based solution

Disable static security code checking

Network and card must be in sync
- Time Window Unit

Key designation

In-flight transactions, deferred authentication

EMV integrated solution

Disable static security code checking

Transparent, no change

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Conclusions

Cyril Lalo, Ellipse

Conclusions

Dynamic Card Security Codes are more secure than static data

Card level security addresses fraud at the source

An issuer-centric solution

Transparent for cardholders

Robust addition to analytical/behavioral-based security layers

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Q&A

Payments Resources

- Secure Technology Alliance Knowledge Center - https://www.securetechalliance.org/knowledge-center/
- Dynamic Security Code Cards: A Primer white paper
- EMV Connection web site
- mDL Connection web site
- U.S. Payments Forum – https://www.uspaymentsforum.org

Speaker Contact Information

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