MasterCard

Innovation and Cybersecurity

Role of Networks

- Provide processing technology and operational systems
- Set standards and rules of the road
- Build and manage global brand to promote usage
- Develop new marketplace opportunities and promote acceptance

Payment System Benefits

Retailer Benefits

- Reliability
- Security
- Efficiency
- Guaranteed Payment
- Increased Sale Potential
- More Business Channels
- Access to More Customers

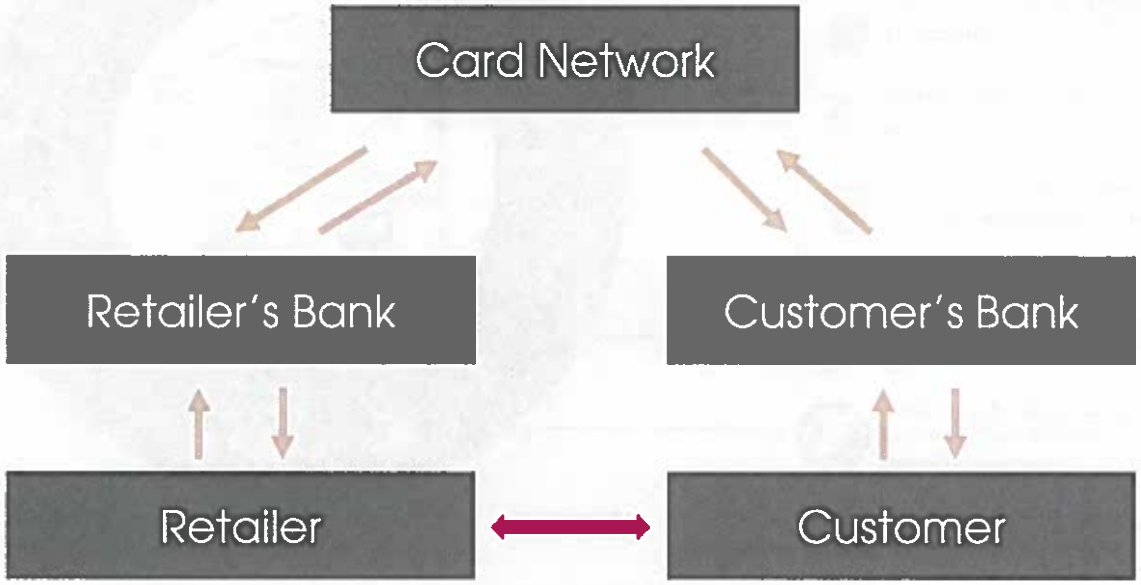
Cardholder Benefits

- Convenience
- Security
- Fraud Protection
- Global Acceptance
- Reliability
- Budgeting

©2016 MasterCard. Proprietary

MasterCard

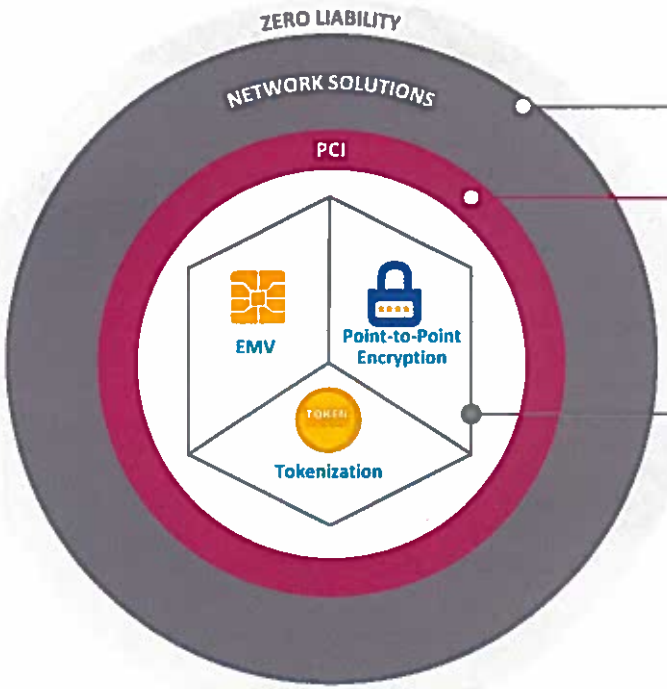
The Payment Ecosystem



©2016 MasterCard. Proprietary

MasterCard

Multi-Layered Protection to Secure All Channels



Network Solutions
(3D Secure, Fraud Scoring, etc.) Improves Payment Authentication

PCI
Secures Data at the Point of Transaction

Point-to-Point Encryption (P2PE)
Secures Data During Transmission

EMV Chip
Authenticates the Card

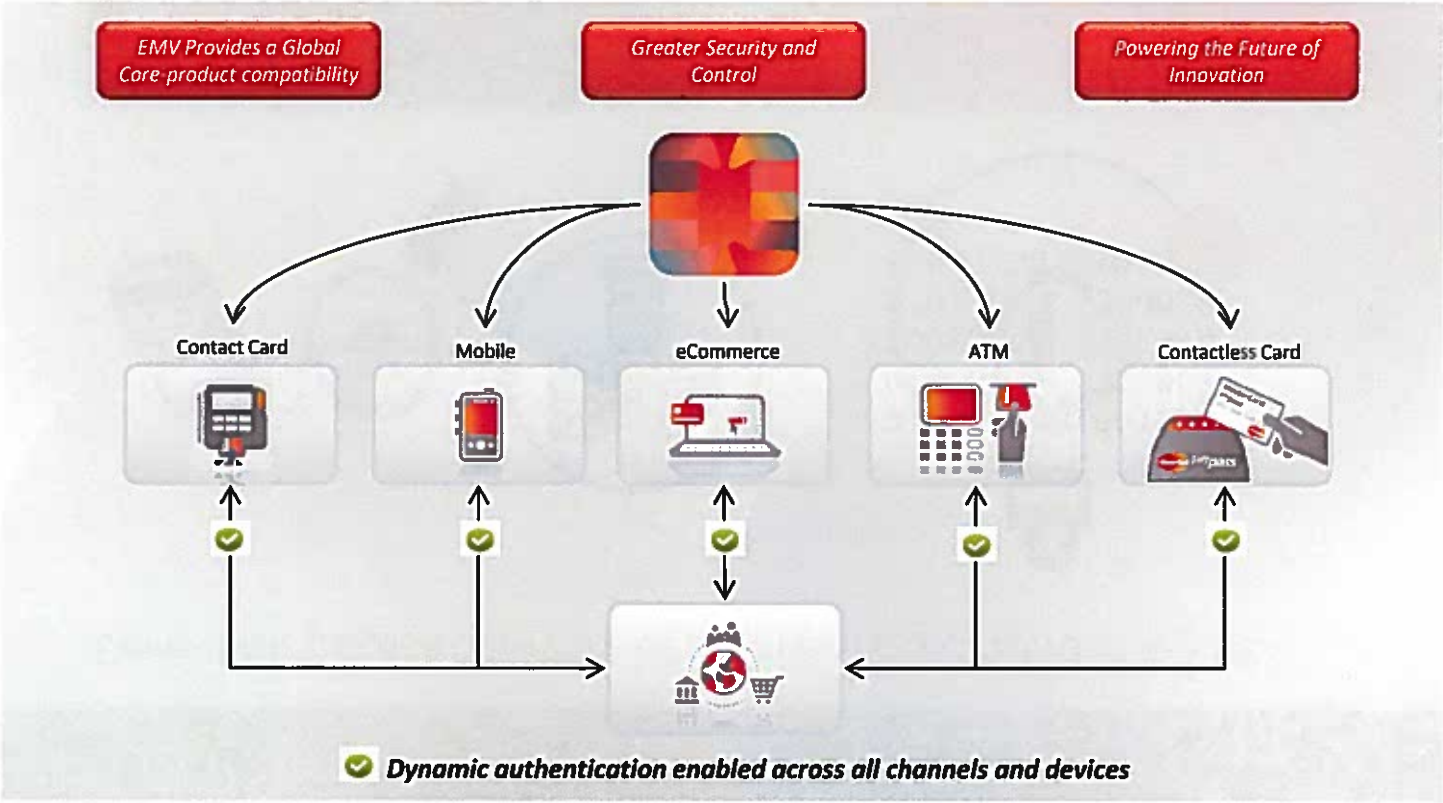
Tokenization
Minimizes Use of PAN Authenticates Mobile/CNP

©2016 MasterCard. Proprietary

MasterCard

EMV Chip: Why Now?

A foundation for the future of payments



©2016 MasterCard. Proprietary

MasterCard

US Payment Card Fraud

Data theft causes over 80% of payment card fraud in the US

80+% of fraud in US

EMV, Tokenization, and Point-to-Point Encryption are technologies designed to reduce risk from payment data being stolen and devalue the data if stolen

©2016 MasterCard. Proprietary

MasterCard

US Roadmaps to EMV Chip Technology

2011 **2012** **2013** **2014** **2015** **2016** **2017**

Roadmaps Announced

APRIL 2013
Acquirers and sub-processor mandates to fully process EMV transactions

OCTOBER 2015
Liability shifts take effect for face-to-face (excluding fuel)

OCTOBER 2016/2017
Liability shifts take effect for ATMs

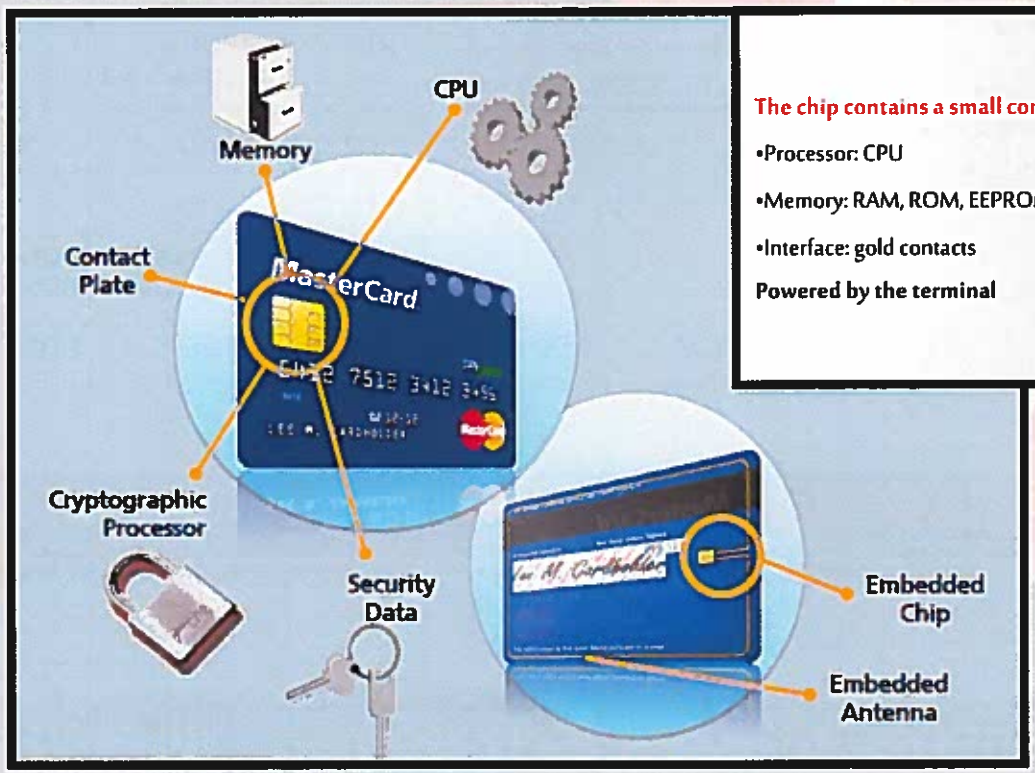
OCTOBER 2017
Liability shifts take effect for automated fuel dispensers

©2016 MasterCard. Proprietary

MasterCard

Chip Fundamentals

What makes a Chip card special?



The chip contains a small computer:

- Processor: CPU
- Memory: RAM, ROM, EEPROM
- Interface: gold contacts

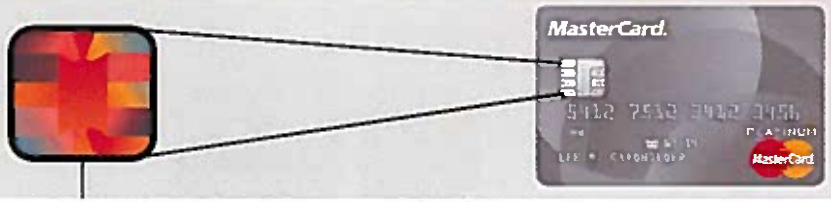
Powered by the terminal

©2016 MasterCard. Proprietary

MasterCard

Chip Fundamentals

The chip card framework

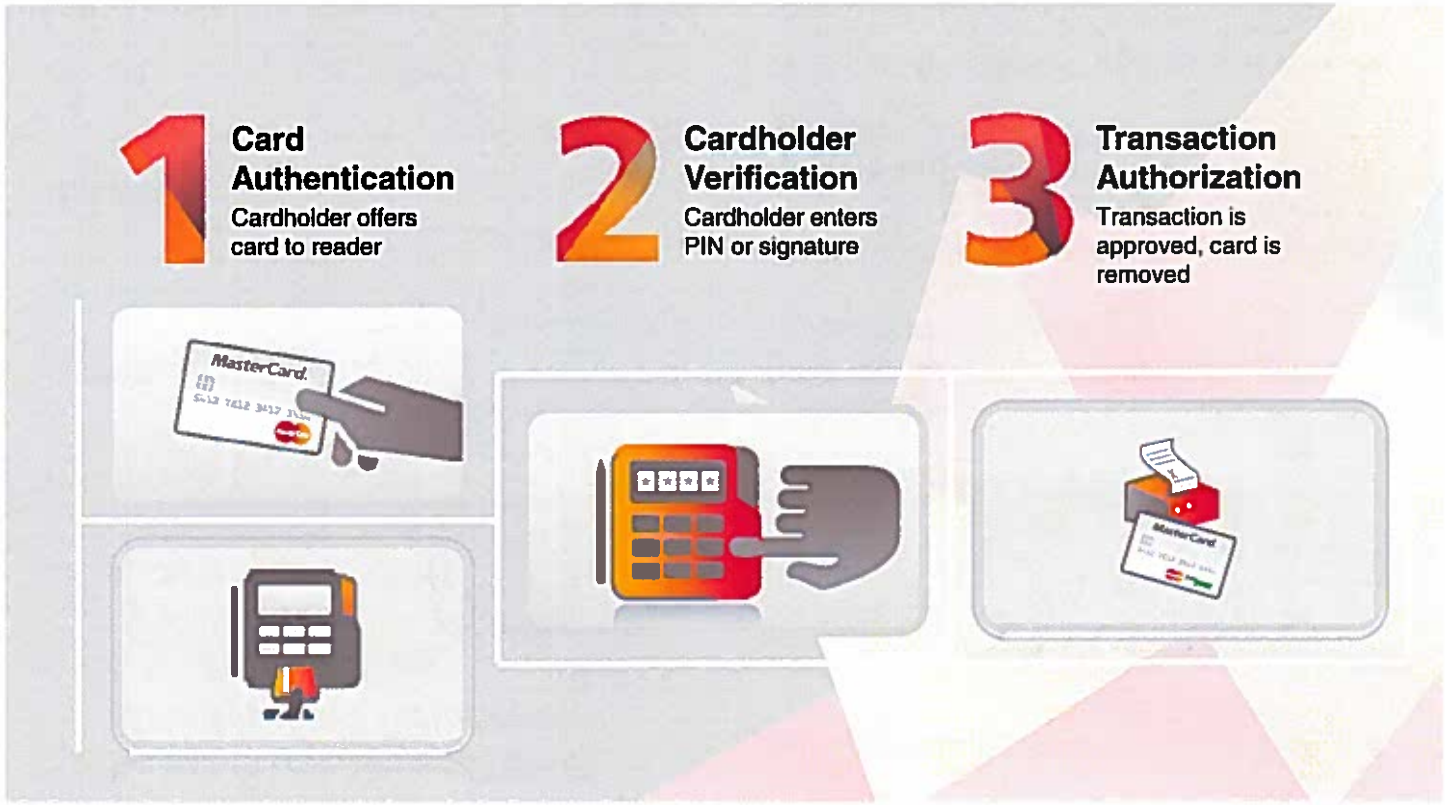
Card & Chip		
Standard	EMV	In order for the card to be compatible with terminals worldwide, the chip has to ***conform to the EMV standard***
Application	M/Chip	Within the EMV-compliant chip a payment application is installed. MasterCard's family of ***payment applications*** is referred to as ***M/Chip***.
Version	M/Chip 2 M/Chip 4 M/Chip Advance	The M/Chip payment application comes in different versions. The newest and most innovative is ***M/Chip Advance***, which enables the issuer to implement a platform for ***next generation payments***

©2016 MasterCard. Proprietary

MasterCard

Chip Fundamentals

EMV Chip transaction flow



©2016 MasterCard. Proprietary

MasterCard

Impact of EMV on Counterfeit Fraud

Domestic Counterfeit Fraud-- % Change from Q3 2008 to Q3 2013

	Brazil	Mexico	Hong Kong	Canada
Counterfeit	↓ -87%	↓ -77%	↓ -69%	↓ -83%

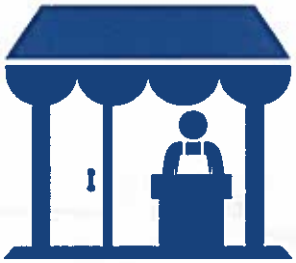
©2016 MasterCard. Proprietary

MasterCard

EMV Global Migration Progress

Current State

2.4B
cards



37M
terminals

29.7%
transactions

Global EMV Adoption Rates

Source. EMVCo, Q4 2014. data combined from Visa, MA, Amex and JCB

©2016 MasterCard. Proprietary

MasterCard

Progress on U.S. EMV Chip Migration

Payment Security Taskforce projections for U.S. EMV chip migration

Nine of the country's largest payment card issuers estimate that **60% of credit and debit cards will contain EMV chips by the end of 2015, rising to 98% by the end of 2017**[1]

Forecast of participating acquirers estimated that **40% percent of their U.S. merchant terminals will be EMV chip capable by the end of 2015**[1]

Source: [1]Payment Security Taskforce press release, September 30, 2015

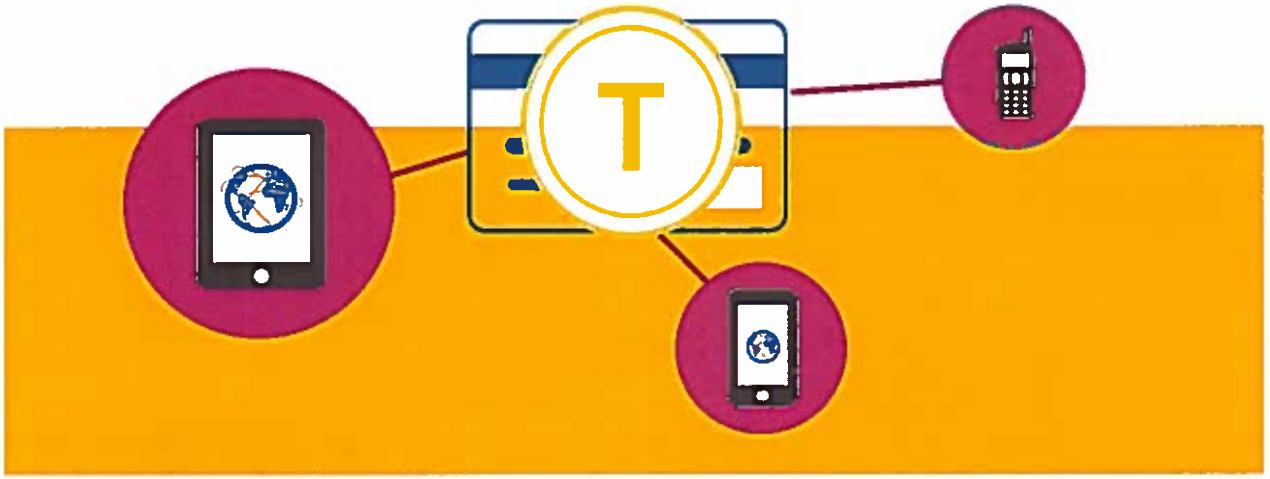
©2016 MasterCard. Proprietary

MasterCard

Tokenization - Devaluing Data

Tokenization provides enhanced security for services like Apple Pay, Android Pay and Samsung Pay – for both in-store and in-app purchases

Tokens replace sensitive account information, such as the account number, with a unique digital identifier. If the token is stolen by a criminal it cannot be used to commit online, mobile, or in-store fraud



©2016 MasterCard. Proprietary

MasterCard