

EMV

Byte 1: Introduction



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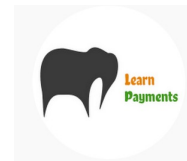




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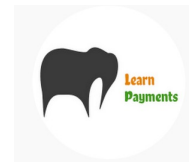
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EMV Card Issuance

HL Process

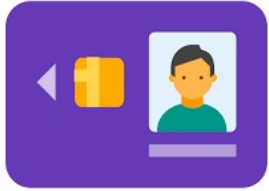
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Types of Smart Cards



Smart Cards everywhere. ID Cards, Payment Cards, Memory Cards, SIM Cards etc.



There are 2 types of Smart Cards

- 1) Memory Cards (*Memory ONLY*)
- 2) Intelligent Smart Card (*Memory + Microprocessor*)



Memory Cards = Phone Memory SD cards or Flash drives

Intelligent Smart Cards = ID Cards or Payment Cards






Types of Intelligent Smart Cards



IC Cards (Contact)

- These are cards which have the chip exposed for contact
 - Example: GSM SIM cards, Payment cards
 - Governed by ISO7816 protocol
- 



Proprietary Proximity Cards

- Contactless cards that can be used by waving or tapping
- Eg: ID Cards
- Manufacturers have their own proprietary protocols (No standards)

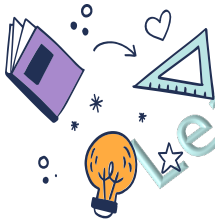


IC Cards (Contactless)

- Enhanced Proximity cards
- Example: Contactless Credit Cards
- Usually doesn't have an exposed chip
- Governed by ISO14443 protocol



Smart Card – Protocols



- ISO7816, ISO14443 are generic Contact and Contactless protocols. Not specific for Payment Cards
- EMVCo a consortium of International Schemes was formed
- They adopted above ISO/IEC protocols and created new standard for Contact and Contactless Cards. This is called “EMV” protocols
- This EMV standard has commands specific for Payment protocols
- Earlier there were either Contact OR Contactless Cards. There are cards that offer both Contact and Contactless capabilities. These are called “Dual Interface Chips”. These are the new normal.

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Anatomy of Chip Cards

- Every computer has Hardware, OS, Applications
- Same with EMV cards

Browser, MS
Office



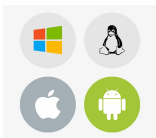
Applications



'Applets'

M/Chip,
VSDC

Windows,
Linux, MacOS

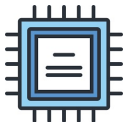


Operating
System



MULTOS,
JavaCard

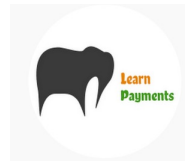
RAM, CPU,
HDD



Hardware



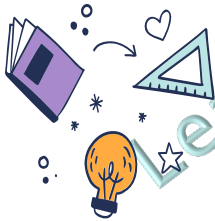
ICC Chip



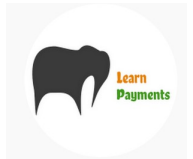
EMV Applets for different Schemes



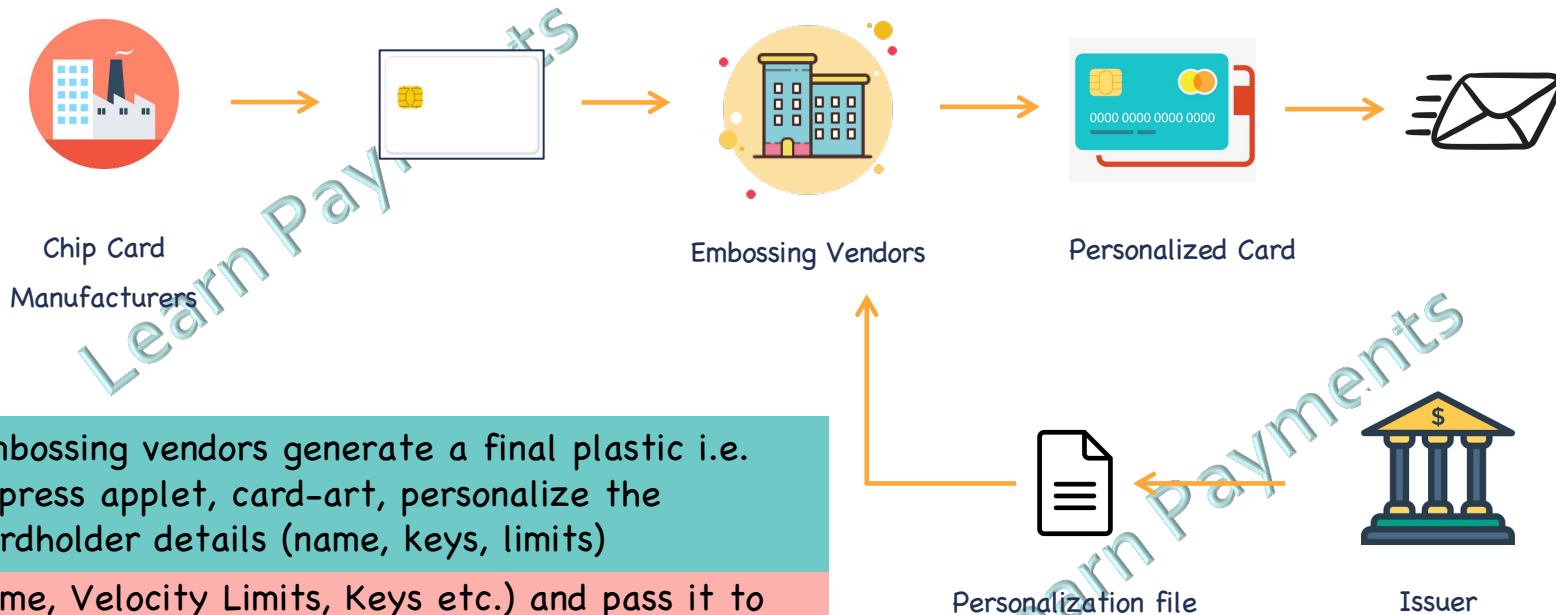
EMV Applications / Applets



- MasterCard: M/Chip
- Visa : VSDC (Visa Smart Debit/Credit Cards)
- AMEX : AEIPS (AMEX ICC Payment Specifications)
- JCB : JSmart
- Discover : D-PAS (Discover Payment Application Spec.)
- NPCI : RuPAY
- CUP/UPI : UICS



HL Process-flow of EMV Card generation



- Embossing vendors generate a final plastic i.e. impress applet, card-art, personalize the cardholder details (name, keys, limits name, Velocity Limits, Keys etc.) and pass it to Embossing vendors

Thank YOU