

Common Payment Systems

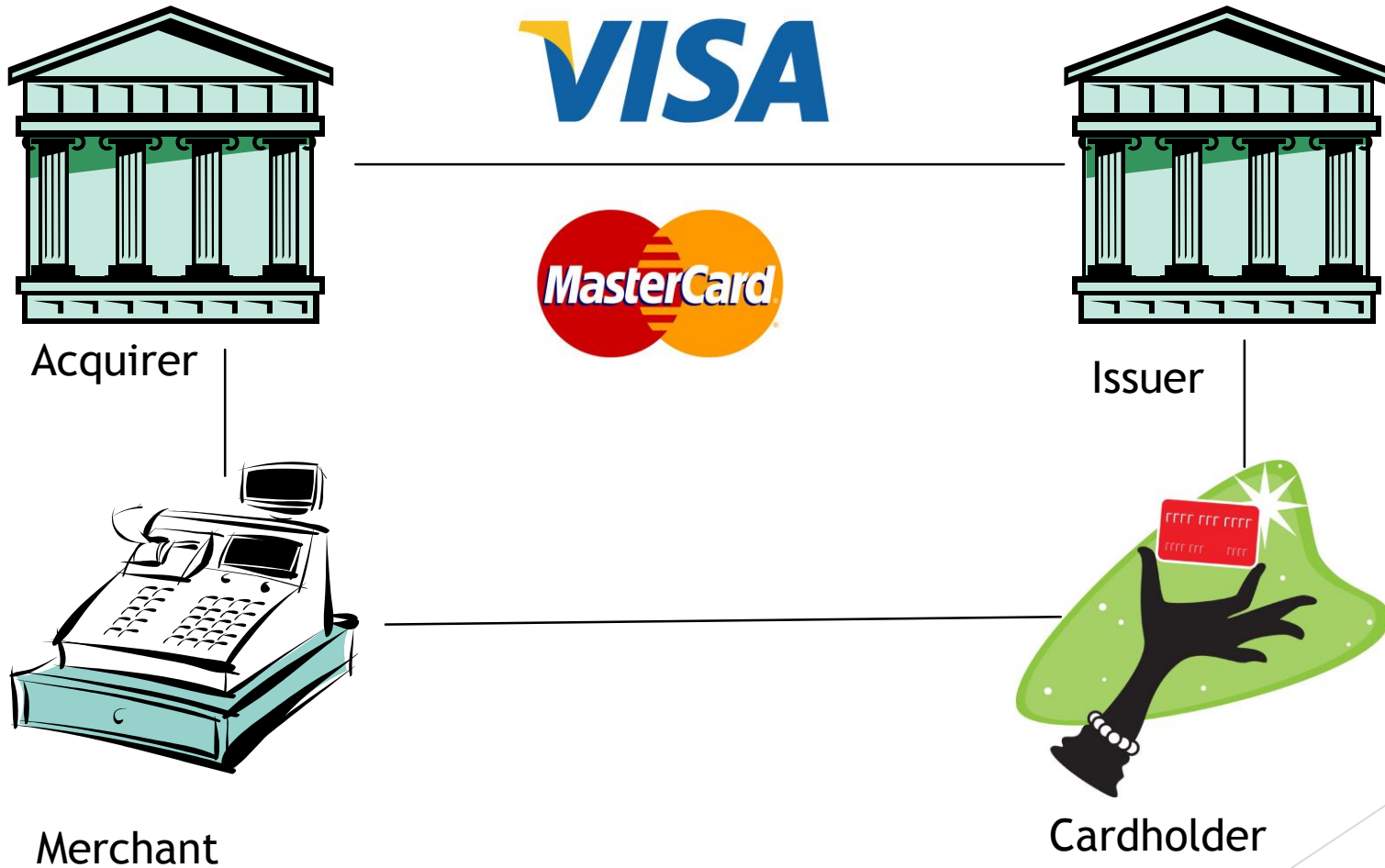
- Who takes what slice of the pie and why?

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What to Expect from this Talk

- ▶ This is not a technical talk
- ▶ This is not a talk about cryptocurrencies
- ▶ This is not a talk about cash as a payment instrument
- ▶ This is a talk about which actors in traditional non-cash payment systems have which incentives, and why
- ▶ The focus will be on credit cards and consumer online payments
 - ▶ U.S. focus
 - ▶ VISA, MasterCard, PayPal
 - ▶ Briefly touching on Apple Pay & MCX/CurrentC

Four Corners Model : Credit Cards, Checks, & Most Instruments



Principals and Intermediaries

Merchants

- Millions

PSPs, ISOs, Gateways

- CyberSource
- Authorize.net
- Square
- Stripe
- Clover Payments

Acquirers

- B of A
- Chase
- Wells Fargo

Acquirers' Processors

- First Data
- Global Payments
- Total Systems

Card Networks

- VISA
- MasterCard
- Discover
- AMEX
- China Union Pay

Issuers' Processors

- First Data
- EDS
- Total Systems

Issuers

- B of A
- Chase
- Citigroup
- Wells Fargo
- US Bankcorp

Consumers

- Billions

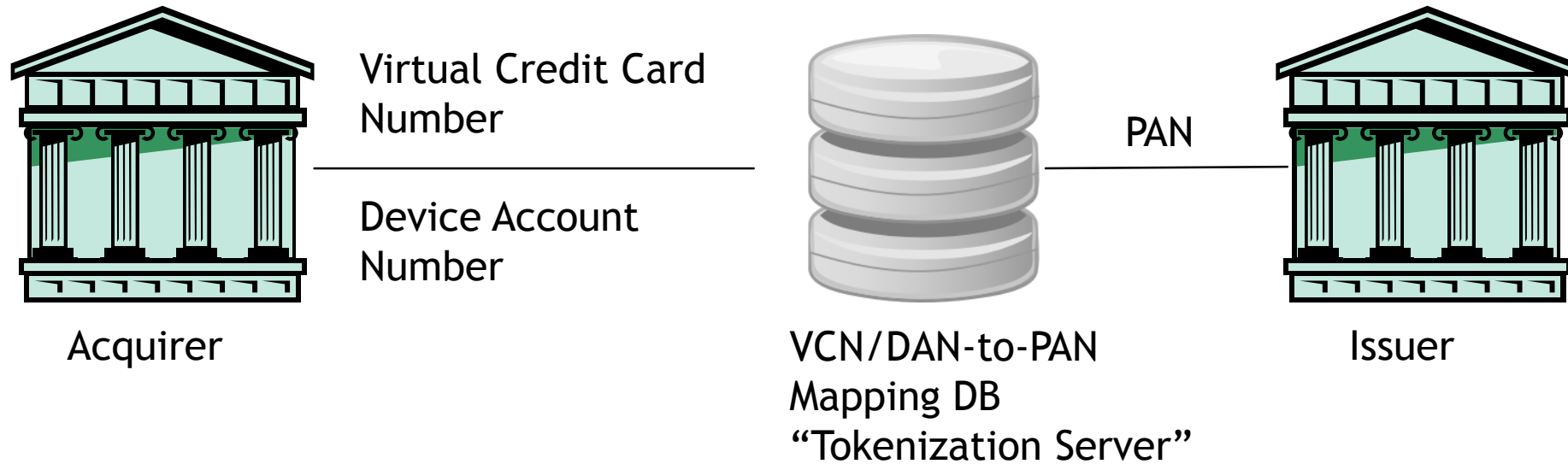
Who Issued the Credit Card?



16 digits
Primary
Account
Number
(PAN)

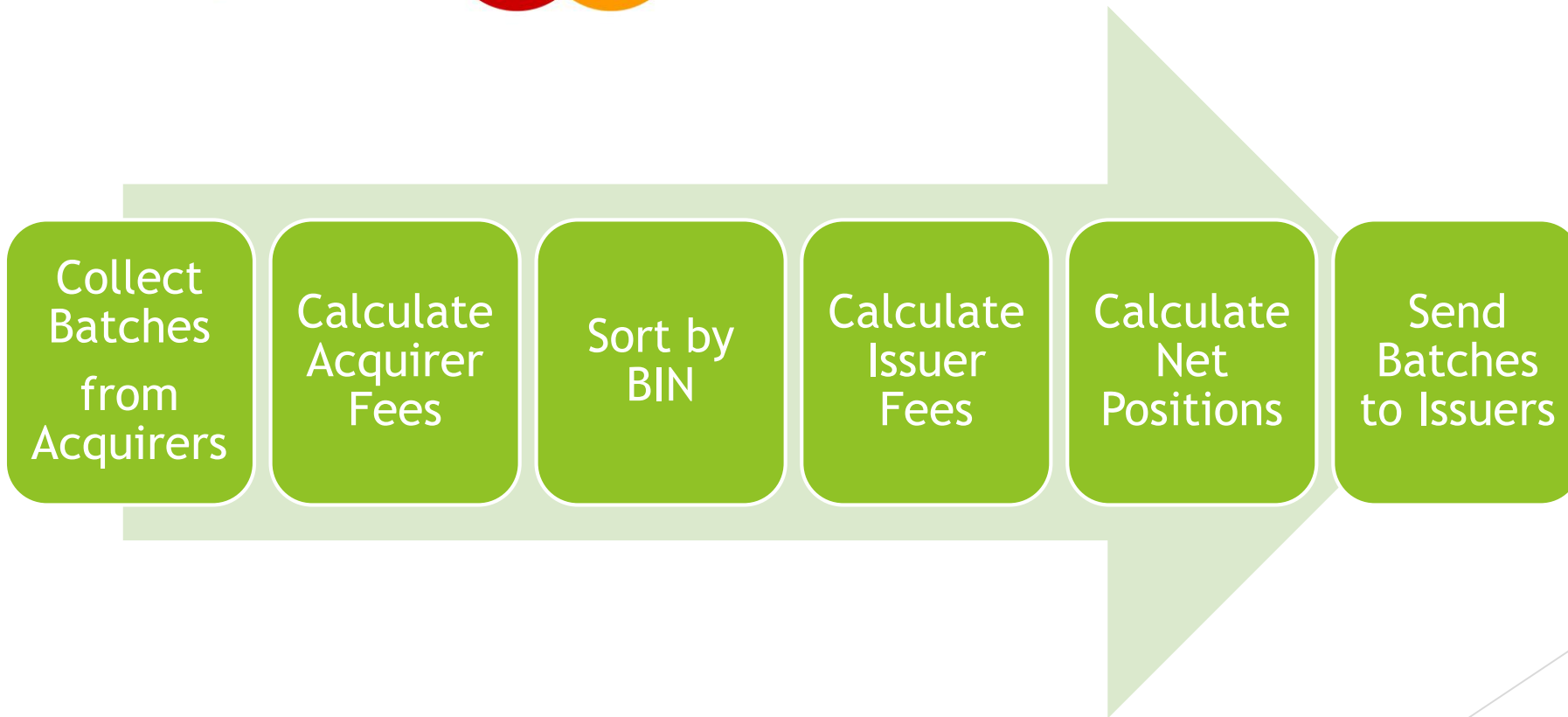
541275	123412345	6
6 digit Bank Identification Number (BIN)	Account Number	Checksum

What Makes Apple Pay Different?



Year	Term	Actors
~2006	"Virtual Credit Card Number"	Various Issuers
2014	Apple Pay "Device Account Number"	Various Issuers, VISA

Card Networks - Clearing & Settlement



Who Pays What?

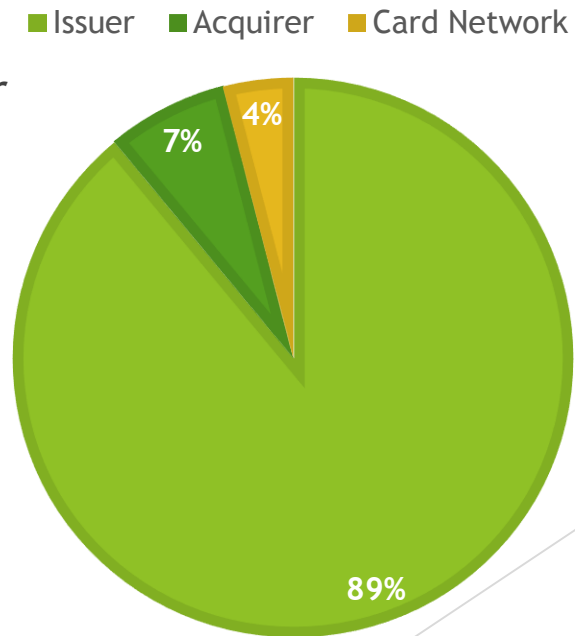
Rule-of-thumb: the merchants pay

Merchants then will raise prices to recover the costs from the consumer

Interchange Fees

- ▶ Transfer price between the Acquirer and the Issuer
- ▶ Originally intended to reimburse issuers for costs
 - ▶ Authorization, Clearing, and Settlement
- ▶ Revenue to Card Issuer, cost to Merchant via Acquirer
- ▶ The issuers always collect the lion's share

FEEES PAID BY MERCHANT



Credit Card Issuers - Customer Terminology Definition

Customer Payment Patterns	Industry Term of Art
Does not pay off credit card balance in full each month	“Revolvers” (Origin: “revolving credit line”)
Pays off credit card balance in full each month	“Deadbeats” (Since the issuer does not get to collect interest payments)

Card Networks - Clearing & Settlement

Example: VISA Signature Card Transaction

- ▶ Issuer collects \$100 for a purchase from the Consumer
 - ▶ Plus interest and potential overdraft fees from Revolvers
- ▶ Issuer pays Network \$98.15, retaining \$1.85 Interchange
- ▶ Network (VISA) pays Acquirer \$98.12, retaining \$0.03
- ▶ Acquirer pays Merchant \$98.00
 - ▶ Discount or fixed transaction fee

Dispute Processing Mechanics

- ▶ Merchant typically will see the charges reversed
- ▶ Detailed steps:
 - ▶ Copy or Retrieval Request
 - ▶ Chargebacks
 - ▶ Pre-Arbitration and Arbitration
 - ▶ Merchant is assessed an additional dispute processing fee

Myth: Credit Card Fraud Represents a Loss to Issuers or Networks

- ▶ Fact: Credit card fraud is a profit center for everybody but the Merchant
 - ▶ And potentially to the consumer, but the consumer doesn't care
- ▶ Scenario 1: Fraud remains undiscovered
 - ▶ "I can't remember what that \$2.56 charge was for. Oh well, who cares."
 - ▶ Value chain collects discounts, fees, interchange, and profits
- ▶ Scenario 2: Fraud is discovered
 - ▶ Merchant is charged back full amount
 - ▶ Merchant pays chargeback processing fees
 - ▶ Acquirers, Networks, Issuers profit
- ▶ Payment systems that reduce fraud have to compensate the existing value chain for fraud-related profits to be of interest to the incumbents

Traditional Non-credit Card Backed Systems - Automated Clearing House (ACH)

- ▶ Payments are pulled directly out of your checking account
- ▶ Indicator: you provided a routing number and account number from a check
- ▶ Notable ACH-based payment providers
 - ▶ PayPal (ACH is default funding option, credit card-based funding options exist)
 - ▶ MCX/CurrentC (backed by Walmart, CVS, other major retailers)
- ▶ Impact on Merchants & Cybercriminals
 - ▶ Lower fees: 0.05% vs. 1.5-2.5%
 - ▶ Overnight settlement
 - ▶ Chargebacks are (mostly) at the good graces of the merchant
 - ▶ Few transaction limits, up to entire balance in your (or 40 million other) checking accounts
- ▶ Impact on Consumers
 - ▶ No “cash back”
 - ▶ Challenging/lengthy dispute resolution process
 - ▶ Theoretical cost savings to Merchant unlikely to be passed on to Consumer

What Matters to Payment Ecosystems?

Transaction Friction

Fraud/Losses

Transaction Fees

Transaction Friction Dominates

- ▶ Major online payment provider
 - ▶ Over 120 million users
 - ▶ Over 100 fulltime staff dedicated to tuning the risk engine
- ▶ Average user makes 3-4 transactions per year
 - ▶ Mainly between Thanksgiving and Christmas
- ▶ Requires “complex password”
 - ▶ Likelihood of Granny not remembering the complex password she last used 10 months ago: virtually certain
- ▶ Shopping cart abandonment rate at checkout if user cannot remember the password: 40%
- ▶ Total loss rate (not all due to fraud): 0.33%
- ▶ Industry outsiders often focus on reducing the 0.33% rather than reducing the 40%.

Transaction Fees

- ▶ Desirable to Issuers, Networks, and Acquirers
- ▶ Desirable to Consumers, if camouflaged
 - ▶ 1% cash back credit card
- ▶ Despised by Merchants
 - ▶ But acceptable if transaction friction is reduced

Lessons to Alternative Payment System Designers

- ▶ Optimize for transaction friction reduction
 - ▶ Faster in-store than swiping a credit card
 - ▶ Faster online than paying by PayPal
 - ▶ Include onboarding friction
- ▶ Transaction costs are a distant second concern
 - ▶ The merchants will care, the consumers may not
- ▶ Fraud reduction is a very distant third goal
 - ▶ PayPal let fraud rates go up by 0.05%
 - ▶ 29% increase in volume on which to collect 3.45% “take rate” in the same time period

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PGP Key ID: 0xFD3428B4

Fingerprint: 39A3 2002 C020 759B B35D EDC7 0455 8D48 FD34 28B4