



Office of the State Controller

OFFICIAL MEMORANDUM

To: State Agencies
Universities
Community Colleges
Local Units of Government

From: Dr. Linda Combs, State Controller *Linda Combs*

Date: February 14, 2019

Subject: 2019 eCommerce Conference

I am pleased to announce that on April 17, 2019, the Office of the State Controller will hold its 2019 eCommerce Conference at the NCSU McKimmon Center (located at 1101 Gorman Street in Raleigh). Presentations will include emerging trends in the eCommerce payment industry, ways to better secure card transactions, and real-world case studies of cybersecurity as well as many other relevant topics. Additional information can be found in the attached 2019 eCommerce Conference agenda.

Many of the state's eCommerce vendors have been invited to attend the conference and will be available so you may learn more about the services offered. Staff from several of the card brands will be in attendance as well as staff from First Data, Bank of America, and Coalfire. They will be available to talk with you and answer any questions you may have. In addition, representatives from Department of Administration and Secretary of State will be available to answer questions about the eProcurement and eNotary Programs respectively.

The conference registration fee is \$65 per attendee and includes breakfast, morning and afternoon breaks, and a buffet lunch.

The doors to McKimmon Center will open at 7:00 a.m., and participant check-in/breakfast will begin at 7:30 a.m. The conference will begin promptly at 8:15 a.m. Conference participants will be eligible to receive up to seven (7) Continuing Professional Education credit hours.

REGISTRATION INFORMATION

Room seating capacity is limited to 300 participants. Registrations will be accepted on a "first-come" basis and will end once the stated capacity has been reached. To register for this conference, visit the [Office of the State Controller website](http://www.osc.nc.gov).

DR. LINDA COMBS, STATE CONTROLLER
MAILING ADDRESS: 1410 Mail Service Center, Raleigh, North Carolina 27699-1410
STREET ADDRESS: 3512 Bush Street, Raleigh, North Carolina 27609
Phone (919) 707-0500 ~ <https://www.osc.nc.gov> ~ An EEO/AA/AWD Employer



Office of the State Controller
eCommerce Conference

Please register as soon as possible as the deadline for registration is April 5, 2019. Payments must be made on or before this date. After this date, no requests for refunds will be considered.

Payment can be made by credit card or electronic transfer in the Cash Management Control System (CMCS) to the **Office of State Controller. Please note the change in how payments should be made.** Agencies should register attendees individually (with separate email addresses). Agencies using CMCS can submit one payment to cover all registration fees if all necessary notations have been made.

If you are paying by electronic transfer, please follow the instructions below:

- **NCAS agencies:** Use IGO vendor number 561611588-03. For the cash management transfer – in the description or remit message line you must include the following for proper processing: Attendee full name; Reference 2019 OSC eCommerce Conference.
- **Non-NCAS agencies paying through CMCS:** Use department code 4161 for payment – in the description or remit message line, you must include the following for proper processing: Attendee full name; Reference 2019 OSC eCommerce Conference.

Payment must be received by April 10, 2019, or your registration will be cancelled.

If you have questions, please contact Jan Prevo at jan.prevo@osc.nc.gov or 919-707-0714. We look forward to your participation in the conference and thank you for your service to our State.



2019 OSC eCommerce Conference

Continuing Professional Education
North Carolina Office of the State Controller

Date:	April 17, 2019 8:15 a.m. to 4:15 p.m.
Location:	The McKimmon Conference and Training Center N.C. State University 1101 Gorman Street Raleigh, NC 27606
Objective:	To offer training on new E-Commerce trends and technology, how to secure card transactions, cybersecurity, the State of NC eCommerce program, and professional development. This conference will benefit State employees who are directly involved with eCommerce or the Payment Card Industry (PCI) Data Security Standards requirements within their organization.
Content:	<ul style="list-style-type: none">– P2PE, Security & Mobile Payment Technology– Electronic Payment Options, a Comprehensive Solution– PCI Security– Cyber Threats & Trends– State of NC eCommerce Program Information and Updates– The Value of Cross Team Collaboration– Industry Trends & New Technology
Instructors:	David Natelson – Vice President, First Data Miguel Garcia – Vice President, CardConnect Kay Griep - Vice President, Bank of America Doris N. Dixon – Director, Bank of America Jon Bonham – Principal, Coalfire Jessica Nye – Special Agent, Federal Bureau of Investigation Taylor Brumbeloe – Central Compliance Manager, Office of the State Controller Brandon Watson - Banking Director, Department of State Treasurer Melissa Rivenbark – Banking Operations Manager, Department of State Treasurer Holly Sullenger – Assistant Director, N.C. State University Joe Helmy – Director, MasterCard
CPE Credit Offered:	Up to seven hours
Materials:	Will be available in advance on the OSC website
Teaching Method:	Lecture
Breakfast:	Available beginning at 7:30 a.m. (ham, chicken and sausage biscuits, fruit, and pastries)
Lunch:	12:15 p.m. – 1:15 p.m. (pork barbeque, fried chicken, sides, and dessert)
Prerequisites:	Employed by a State agency, University, Community College, or a local unit of government that participates in the State's eCommerce Program or PCI compliance efforts.
Advance Preparation:	None
Level:	Basic
Exhibitors:	First Data, Bank of America, Coalfire, Vigitrust, Discover, American Express, Department of Administration eProcurement, Secretary of State eNotary, Office of the State Controller

DEVELOPERS: [First Data](#), [Bank of America](#), [Coalfire](#), [FBI](#), [OSC](#), [DST](#), [NCSU](#), [MasterCard](#)

SPONSOR: [NC Office of the State Controller](#)



2019 OSC E-Commerce Conference

AGENDA

Wednesday, April 17, 2019 – McKimmon Center Raleigh, NC

- 8:15 - 8:20 Call to Order – Michael Euliss, Office of the State Controller, Communications Director
- 8:20 - 8:30 Opening Remarks – Dr. Linda Combs, State Controller
- 8:30 - 9:20 P2PE, Security & Mobile Payments – David Natelson, First Data & Miguel Gracia, CardConnect
- 9:20 - 10:10 PCI Security – Jon Bonham, Coalfire
- 10:10 – 10:35 Break
- 10:35 – 11:25 Industry Trends & New Technology – Joe Helmy, MasterCard
- 11:25 – 12:15 State of NC eCommerce Program Info & Updates – Taylor Brumbeloe, NC Office of the State Controller, Brandon Watson & Melissa Rivenbark, Department of the State Treasurer
- 12:15 – 1:15 Lunch
- 1:15 – 2:05 Cyber Threats & Trends – Jessica Nye, Federal Bureau of Investigation
- 2:05 – 2:55 Electronic Payment Options, A Comprehensive Solution – Kay Griep & Doris Dixon, Bank of America
- 2:55 – 3:25 Break
- 3:25 – 4:15 The Value of Cross-Team Collaboration – Holly Sullenger, NC State University
- 4:15 Closing Remarks - Michael Euliss, Office of the State Controller
-

JON BONHAM

PRINCIPAL, ENTERPRISE RISK AND COMPLIANCE



Education, Certification

- Seminole State College, Business
- Certified Information Systems Auditor, (CISA)
- PCI Qualified Security Assessor, (QSA)

Biography

Jon, is a Principal for the ERC / Payments practice group at Coalfire. He leads engagements to understand, plan and prove compliance for his customers.

Since joining Coalfire back in 2008, Jon has had a hand in many areas of the company. He has been in a director in the sales, service and now delivery departments.

He has a background in financial service prior to coming to Coalfire and now specializes in enterprise customers. Jon works with state and local governments, higher education and hospital systems. He is a subject matter expert in this space and works with his clients to build strong PCI compliance programs to manage the risks and responsibilities.

Jon speaks regularly at many national conferences with an emphasis on payment and compliance.



VENDOR MANAGEMENT

Jon Bonham CISA, QSA
Principal, Coalfire Systems, Inc.

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AGENDA

About Linda
About Jon and Coalfire

- Requirements 12.8 and 12.9
- Requirement 12.8.5 Responsibility Matrix
- Requirement 12.8.1 List of Service Providers
- Requirement 12.8.2 Written Agreements
- Requirement 12.9 Written Agreements
- Requirement 12.8.3 Hiring Service Providers
- Requirement 12.8.4 Monitor Service Providers



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If you have a question, shout it out.



COALFIRE

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JON BONHAM

Been with Coalfire for over 10 years.

Works with Universities, State and local governments and hospital systems.

Live in TN with my wife. 3 kids all grown and living around the world.

Coalfire has been around since 2001. Currently has about 700 employees.

PCI is the largest practice but also does HIPAA, FISMA, FEDRAMP, CLOUD, Scans, Pen-testing and most other areas including GDPR



COALFIRE

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WHY WE ARE HERE

Requirement 12.8 and 12.9

C CAL FIRE

5

REQUIREMENT 12.8.5

Is information maintained about which PCI DSS requirements are managed by each service provider, and which are managed by the entity? (12.8.5)



C CAL FIRE

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REQUIREMENT 12.8.2

Is a written agreement maintained that includes an acknowledgement that the service providers are responsible for the security of cardholder data the service providers possess or otherwise store, process, or transmit on behalf of the customer, or to the extent that they could impact the security of the customer's cardholder data environment? (12.8.2)

NOTE: The exact wording of an acknowledgement will depend on the agreement between the two parties, the details of the service being provided, and the responsibilities assigned to each party. The acknowledgement does not have to include the exact wording provided in this requirement.

CAL FIRE

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REQUIREMENT 12.9

Do service providers acknowledge in writing to customers that they are responsible for the security of cardholder data the service provider possesses or otherwise stores, processes, or transmits on behalf of the customer, or to the extent that they could impact the security of the customer's cardholder data environment? (12.9)



CAL FIRE

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REQUIREMENT 12.8.3

Is there an established process for engaging service providers, including proper due diligence prior to engagement? (12.8.3)

CALFIRE

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REQUIREMENT 12.8.4

Is a program maintained to monitor service providers' PCI DSS compliance status at least annually? (12.8.4)



CALFIRE

12

WHAT ELSE IS THERE FOR E-COMMERCE?

PCI-DSS 1.2

Anything that STORES, PROCESSES or TRANSMITS payment card data.

V3.0

Is connected to or...

CALFIRE

13

WHAT ELSE IS THERE FOR E-COMMERCE?

PCI-DSS 1.2

Anything that STORES, PROCESSES or TRANSMITS payment card data.

V3.0

Is connected to or...

Can impact the security of.

CALFIRE

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Questions



JON BONHAM CISA, QSA
PRINCIPAL
Coalfire Systems, Inc.
Cyber Assurance Services
jbonham@coalfire.com

C  A L F I R E

Taylor Brumeloe Bio

Taylor Brumeloe joined the NC Office of the State Controller in 2015 as a Financial Specialist managing the Statewide Electronic Commerce Program. In her current role as Central Compliance Manager in the Statewide Accounting Division, she manages multiple statewide programs including Cash Management, Federal & General Fund Reporting, Electronic Commerce, Statewide Reserves and Accounts Receivable.

Prior to joining OSC, Taylor served in eCommerce and Cash Management roles for five years at North Carolina State University.

Taylor has a Bachelor of Science in Finance from Western Carolina University.

STATEWIDE ELECTRONIC COMMERCE PROGRAM

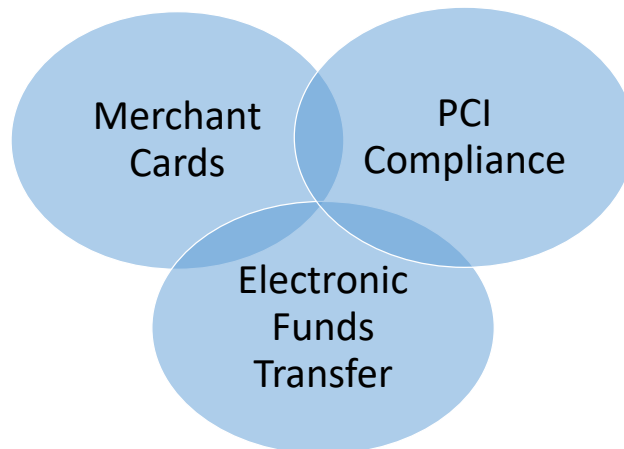
INFO & UPDATES

TAYLOR BRUMBELOE, NC OFFICE OF THE STATE CONTROLLER
BRANDON WATSON, DEPARTMENT OF STATE TREASURER
MELISSA RIVENBARK, DEPARTMENT OF STATE TREASURER



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STATEWIDE CONTRACTS



2

MERCHANT CARD CONTRACT

SunTrust Merchant Services → Acquirer

First Data → Processor

Current contract expires February 2022

RFP for new contract will go out early 2021

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MERCHANT CARD CONTRACT

Amendment 1

Dec 2015

- Quarterly Admin Fee
- \$.0035 x Number of transactions
- Helps fund cost of PCI Compliance services

Amendment 2

Nov 2016

- EBT (Electronic Benefits Transfer) Addendum
- Updated Fee Schedule
- Updated contract language per Legislation

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MERCHANT CARD CONTRACT

Amendment 3 – In Process

- Convenience Fee Services
- CardConnect Services
- Clover Devices



MERCHANT CARD CONTRACT

Capture Methods:

- Point of Sale Terminals
 - Wired – FD130, Clover Systems
 - Wireless – FD410, Clover Go
- Online Gateways
 - Payeezy
 - PayPoint
 - 3rd party gateways with First Data integration



MERCHANT CARD CONTRACT

New Account Setup

- All forms completed electronically through DocuSign
- OSC review and turnaround within 2 business days
- First Data setup time is 10-15 business days

Clientline Setup or Changes to Existing Account

- All forms completed electronically through DocuSign
- OSC review and turnaround within 2 business days
- First Data completion time is 5-10 business days



PCI SERVICES CONTRACT

Coalfire → Vulnerability
Scanning

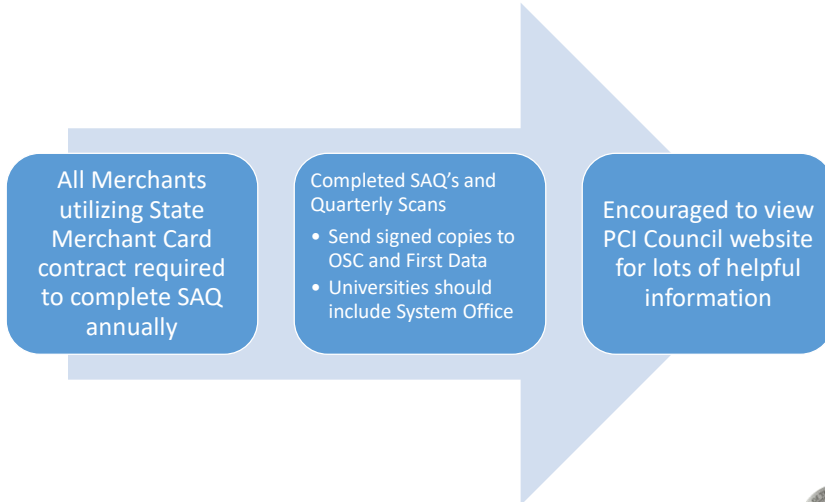
VigiTrust → Self-Assessment
Questionnaire

Current contract expires Dec
2019

RFP for new contract in
development now



PCI SERVICES CONTRACT



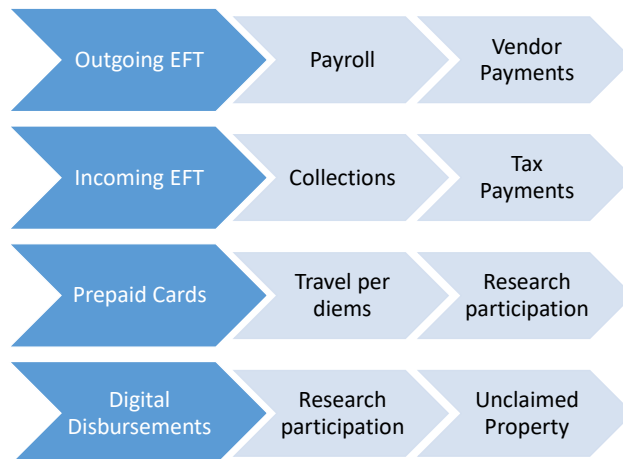
ELECTRONIC FUNDS TRANSFER CONTRACT



ELECTRONIC FUNDS TRANSFER CONTRACT

Amendment 1 Nov 2014	Amendment 2 Jan 2015	Amendment 3 Jun 2018
<ul style="list-style-type: none"> • Returns account overdraft fees • UPIC service • Electronic Data Interchange service 	<ul style="list-style-type: none"> • Prepaid card service 	<ul style="list-style-type: none"> • 1 year contract extension • Update to State's contract terms & conditions

ELECTRONIC FUNDS TRANSFER CONTRACT



EXEMPTION PROCESS

Exemption from State Contracts

- Required for State Agencies & Universities
- Business case
- Compliance due diligence
- Cost Analysis
- Submitted to OSC



EXEMPTION PROCESS

Exemption from Daily Deposit Act

- §147-77. Daily deposit of funds to credit of Treasurer
- §116-40.22(e). Management Flexibility – UNC System
- Required for State Agencies & Universities
- Business case
- Submitted to Dept of State Treasurer



COMMON ERRORS

Neglecting to fund the ACH file

- Impacts cash flow calculations
- Could result in ACH file being held by the bank
- Could cause accounts to go into the negative

Sending a duplicate ACH file

- Can be difficult to retrieve duplicate payments
- Duplicate debits could cause fees and harm reputation

Sending an ACH file with a same day effective date

- Higher cost for same day transmission

Missing a daily deadline

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COMMON ERRORS – FUNDING ERROR



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COMMON ERRORS – DUPLICATE FILE

- Establish proper internal controls to avoid and detect this type of error prior to file submission
- If file hasn't been distributed, it can be deleted
- Reversal request must be submitted within 5 days
- Can reverse individual items or the whole file
- All reversals are best efforts basis



COMMON ERRORS – DAILY DEADLINES

10:00 a.m.	10:30 a.m.	11:30 a.m.
<ul style="list-style-type: none"> • All funds transfer requests due to DST. 	<ul style="list-style-type: none"> • Requisitions submitted in CMCS 	<ul style="list-style-type: none"> • Last day of month deadline to submit requisitions in CMCS



EFTS & THIRD PARTY PROVIDERS

Involve OSC and/or DST as early on in the process as possible.

- Allow 3 weeks for account opening
- Confirm compliance with State statutes and policies
- Will review wording for RFP's

Ultimate Payee - §147-86.11(f)(1)

- "Moneys deposited with the State Treasurer remain on deposit with the State Treasurer until final disbursement to the ultimate payee."



EFTS & THIRD PARTY PROVIDERS

Two Ultimate Payee Compliant Models

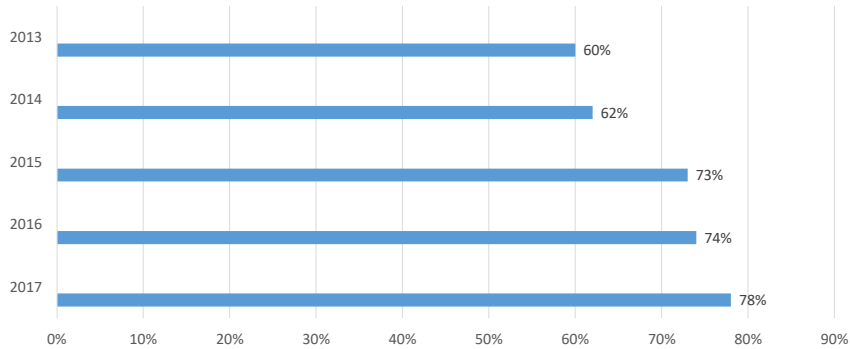
Third party creates the ACH file and transmits to the bank. Also submits a funding request to the agency to fund the file if needed. The funds flow out of or into a State Treasurer account.

Third party creates the ACH file and transmits the file to its bank. The third party uses its funds for ACH payments and seeks reimbursement from the agency.



PAYMENTS FRAUD

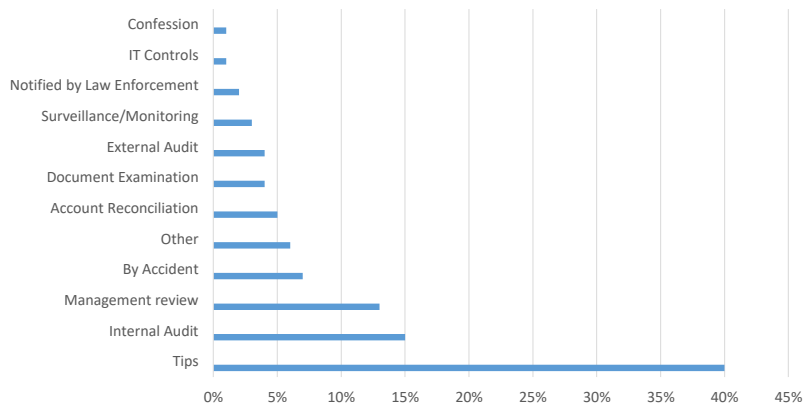
Organizations Impacted by Payments Fraud



source: 2018 AFP Payments Fraud and Control Survey Report

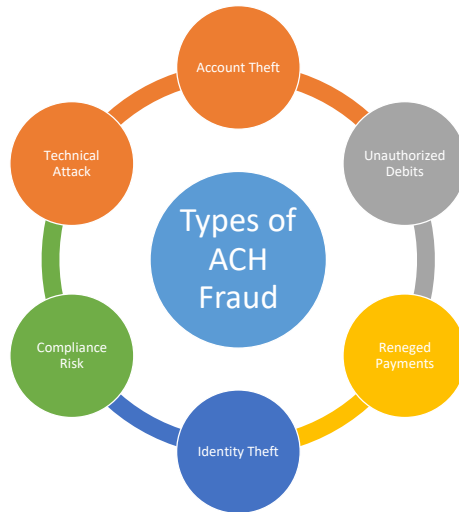
PAYMENTS FRAUD - DETECTION

Initial Detection of Fraud

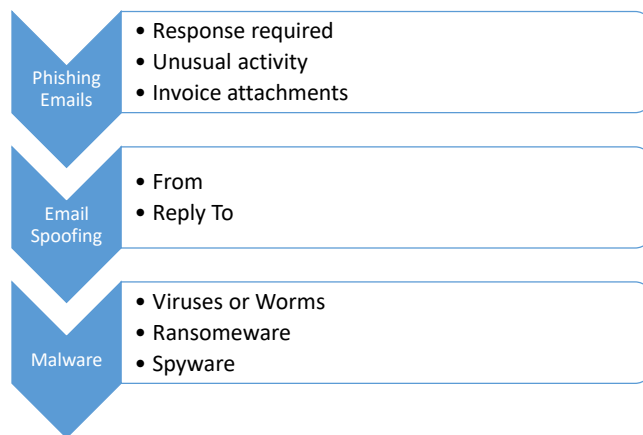


source: 2018 Report to the Nations-Global study on Occupational Fraud and Abuse

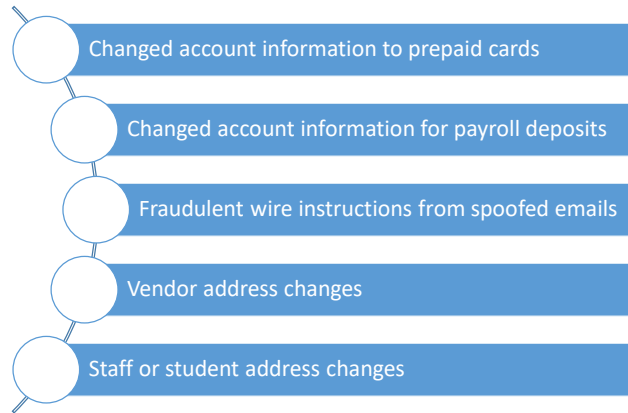
PAYMENTS FRAUD



PAYMENTS FRAUD



PAYMENTS FRAUD



ACH FRAUD PREVENTION

Internal Controls

- How do you handle changes to bank account information?
- Verifying change requests
- Removing accounting policies from the internet

Education

- Staff onboarding
- Student orientation
- Ongoing training



ACH FRAUD PREVENTION

Tools

- ACH Debit Blocks
- ACH Debit Filters
- Account Validation Service
 - Provides access to a database of U.S. bank accounts
 - Can be used to verify bank account information
 - Banks must be part of the network
 - Cost can be prohibitive



ACH FRAUD – THE AFTERMATH

Gather Information

- Where/when/how was the fraud detected
- Number of items in the file
- Total \$ amount impacted by fraud
- Total \$ amount of the file
- File effective date
- Date file was sent to the bank
- New prepaid cards present in the file



ACH FRAUD – THE AFTERMATH

Calls to make

- Department of State Treasurer
- Office of the State Controller
- Bank
 - Initiate an ACH file reversal
 - Be wary of signing any type of indemnity agreement
- Local Law Enforcement
- State Bureau of Investigation
- Your Legal Staff



SUBMITTED QUESTIONS

Question:

State agencies work with First Data to acquire new point of sale equipment and deactivate old equipment. Can you go over the process, start to finish?



SUBMITTED QUESTIONS

Question:

The payment solutions field is constantly changing. Does the State or OSC have a preferred vendor for electronic P2P transactions? We have requests to use Zelle or Venmo for payments to student athletes, study subject payments for research and even vendor payments.

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SUBMITTED QUESTIONS

Question:

Is there a Master Service Agreement with DocuSign for eSignature?

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SUBMITTED QUESTIONS

Question:

Can we create a UNC System PCI/eCommerce listserv to be able to ask questions and get additional information?



SUBMITTED QUESTIONS

Question:

There are lots of benefits to a 3rd party service provider acting as the MOR (Merchant of Record) because it takes a lot of the PCI responsibility off the agency or school. But most 3rd parties don't settle within 24 hours which goes against the Daily Deposit Act. Can a 3rd party remit once they hit the \$5,000 threshold? When would an exemption be required?



SUBMITTED QUESTIONS

Question:

Does each entity need to request an exemption from the Daily Deposit Act or is there a list of service providers who have been granted exemption from the Daily Deposit Act that can be shared?

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SUBMITTED QUESTIONS

Question:

Can we revive the Quarterly PCI/eCommerce conference calls that used to be run by OSC?

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CONTACT INFORMATION

Office of the State Controller

- Courtney Michelle – eCommerce Specialist
 - courtney.michelle@osc.nc.gov
- Taylor Brumbeloe – Central Compliance Manager
 - taylor.brumbeloe@osc.nc.gov

Department of State Treasurer

- Brandon Watson – Banking Director
 - brandon.watson@nctreasurer.com
- Melissa Rivenbark – Banking Operations Manager
 - melissa.rivenbark@nctreasurer.com

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Doris N. Dixon
Global Product Sales, Director

Doris N. Dixon is a senior prepaid card product specialist on the Bank of America Prepaid Card Products team, focusing on government prepaid card solutions. Within this team under Global Transaction Services, she is responsible for working with government client teams to identify and understand client needs and strategically develop prepaid card solutions to meet those needs. In addition to government clients, she also supports clients in the specialized industries and higher education segments.

Doris joined Bank of America Merrill Lynch in 2001 as a marketing product manager, responsible for the marketing of all Commercial Prepaid and Payroll Card products. Over the years she has also served as a senior product manager for the bank's CashPay® Payroll Card, Commercial Prepaid Card and Government Prepaid Card products, where she was responsible for the strategy, marketing and financial statement execution of these card programs. She was instrumental in building our Government Prepaid Card state agency program offering, which currently provides the largest unemployment card program in the nation.

Prior to joining the bank, Doris was a project and marketing manager in Commercial Card Products at First Union Bank (now Wells Fargo). A native Californian, she began her career in the entertainment industry serving in production and development positions for television and film.

Doris received a Bachelor of Arts degree in Communications from the University of Southern California and holds a Masters of Business Administration degree from Wake Forest University Babcock School of Management.

Currently residing in Charlotte, NC she is a member of the Charlotte chapter of the Bank of America Black Professional Group (BPG) and enjoys family, friends and her lifelong love of playing tennis.

Electronic Payment Options A Comprehensive Solution

2019 OSC eCommerce Conference

Doris Dixon, Senior Prepaid Card Specialist
Kay Griep, Product Manager
Lora Prisock, Senior Client Manager

April 17, 2019



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The move away from paper payments



Top reasons cited for P2E Migration¹

Increased efficiency **88%** Reduced costs **82%**

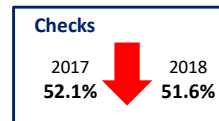
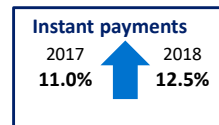
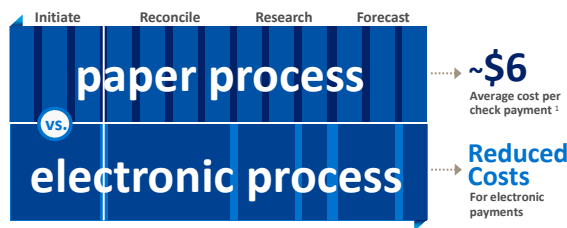
79%

Working to achieve P2E check conversion¹

Check challenges driving decline:

- Increasing cost of paper processes—including postage costs
- Slow to reach customers—perceived as poor customer service
- Losses from fraud and theft—plus the additional costs for stop-payment and reissues

Non-cash payments are growing while check payments decline*



¹ 2015 AFP Payments Cost Benchmarking Survey; Best Estimated Cost for issuing a paper check on a per item basis—mean: \$5.91, median: \$3.00

² ¹ <https://www.pymnts.com/disbursements/2018/disbursement-satisfaction-index-convenience-certainty-choice-payment-methods/>

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B2C options to replace costly paper checks

Paper-to-electronic solutions



Solutions have evolved to lower your costs while **increasing customer satisfaction**

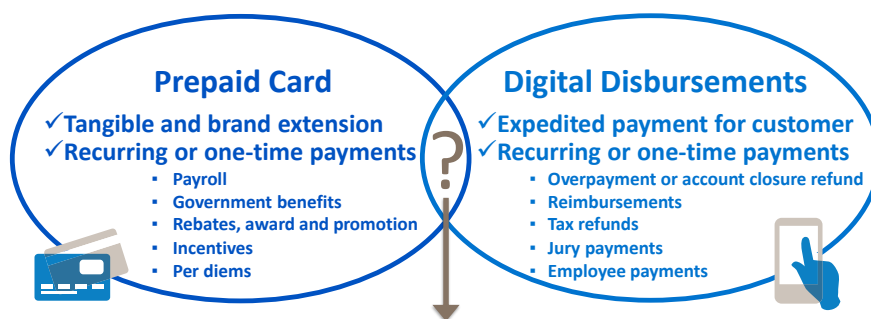
	Payment Profile	Anticipated Benefits
ACH Transfer <small>(Automated Clearing House)</small> 	<ul style="list-style-type: none"> ▪ Recipient must provide bank account info ▪ Robust remittance capabilities ▪ Credit push and debit pull 	<ul style="list-style-type: none"> ▪ Most cost effective electronic payment method ▪ Broadly used, highly reliable ▪ Flexible payment value date
Prepaid Card 	<ul style="list-style-type: none"> ▪ Use for recurring and non-recurring payments ▪ No bank account required ▪ Established payment type—accepted world-wide 	<ul style="list-style-type: none"> ▪ Full escheatment management ▪ Faster, less costly than check and more secure than cash ▪ Provides a branded reminder
Digital Disbursements 	<ul style="list-style-type: none"> ▪ Best for B2C non-recurring payments ▪ U.S. bank account required—but NO account info needed ▪ Use email or phone number for payment file 	<ul style="list-style-type: none"> ▪ Innovative, customer-centric option provides fast payment ▪ Eliminates need to ask for and store bank account info ▪ More predictable settlement than checks

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Addressing your payment needs

Determining which B2C solution is the best fit



Although it seems like there might be overlap, usually one of the solutions is preferred for a specific use.

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Prepaid Card Solutions




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Commitment to Prepaid



Global brand recognition. Strong national footprint.

<p>20 years Experience in prepaid solutions</p>	<p>\$20bn Disbursed annually</p>	<p>TOP FOUR ISSUER COMMERCIAL PREPAID PROGRAMS 2018 Nilson Report</p> 
<p>99.99% Authorization uptime</p>	<p>25mm Transactions processed monthly</p>	<p>BEST IN THE INDUSTRY PREPAID GOVERNMENT PROGRAMS 2017 Survey, National Consumer Law Center</p> 
<p>\$100+mm Invested since 2010</p>	<p>100% Call Center availability</p>	<p>GREATEST GAINS AUTHORIZATION APPROVAL RATE, POS USAGE, PORTFOLIO GROWTH AND GROSS FRAUD RATE REDUCTION 2018 VISA DPS Client Achievement Awards</p>



- Strong relationships and understanding of regulatory environment
- Industry-leading reputation and world-class service capabilities
- Zero Liability Coverage, FDIC insured accounts
- Fair and reasonable cardholder fees
- Largest bank-owned ATM network with 16,000+ locations nationwide

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Getting started with Prepaid

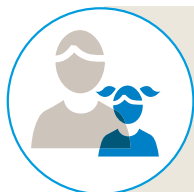


Who can you pay with Prepaid Card?



Employees

- Payroll
- Retirement/Pension
- Per diems
- Payments/Reimbursements
- Incentives/Rewards
- Workers Compensation



Recipients

- Unemployment/Disability
- Tax Refunds
- Child Support
- Refunds/Disbursements
- Financial Aid/Title IV Payments
- Per diems – domestic and study abroad
- Research Study Participant Payments

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Valuable benefits of prepaid card vs. check



Reduced Costs

Eliminates check processing expenses; reduces bank fees and account reconciliation costs



Reduced Risk

Mitigates the liability/cost associated with cash or lost or stolen checks



Streamlined Administration

Successfully helps integrate electronic payments, while improving staff productivity



Better Efficiency

Quicker and more successful reconciliation of funds than through paper-based, manual methods



Improved Transparency

Easier to monitor disbursements to show effective management and accountability



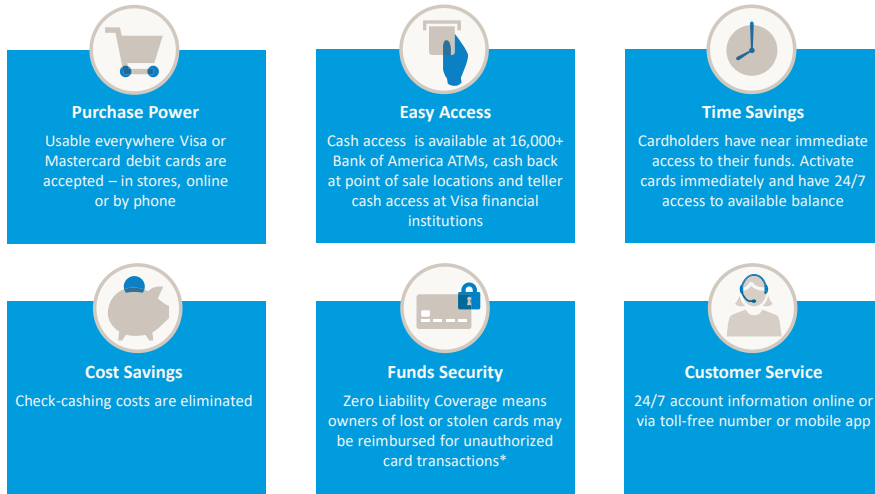
Regulatory Compliance

We manage the escheatment process and compliance state regulations.

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Valuable benefits of prepaid cards for cardholders

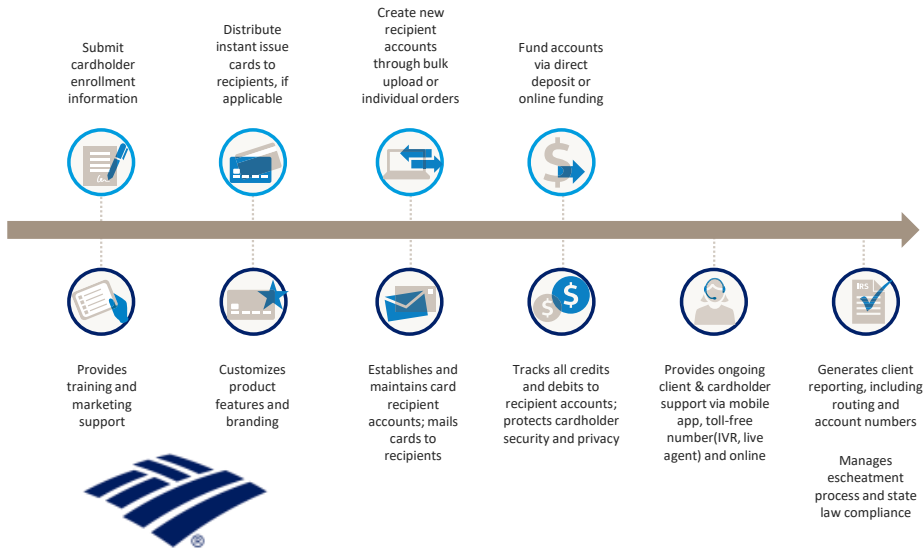


9

*Subject to certain terms and conditions set forth in the cardholder deposit agreement

9

How our Prepaid program works



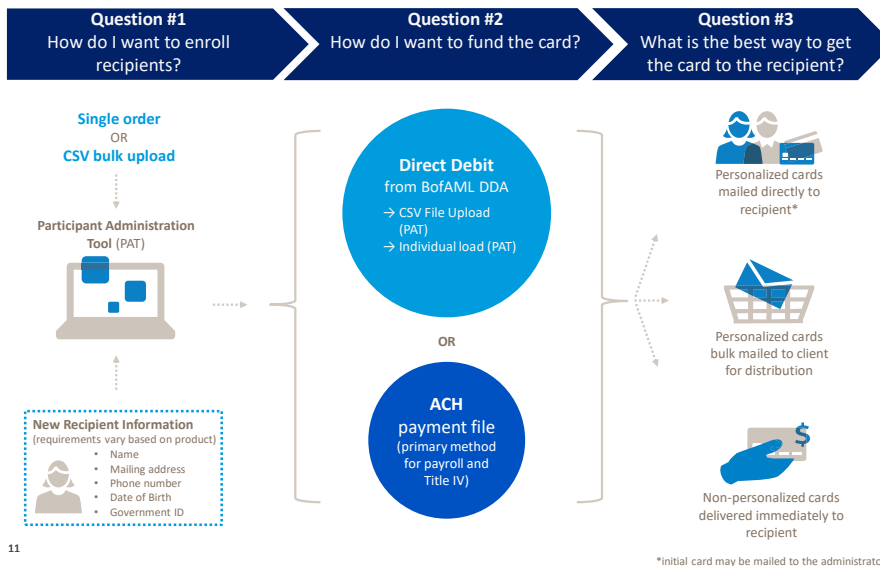
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Account enrollment and funding



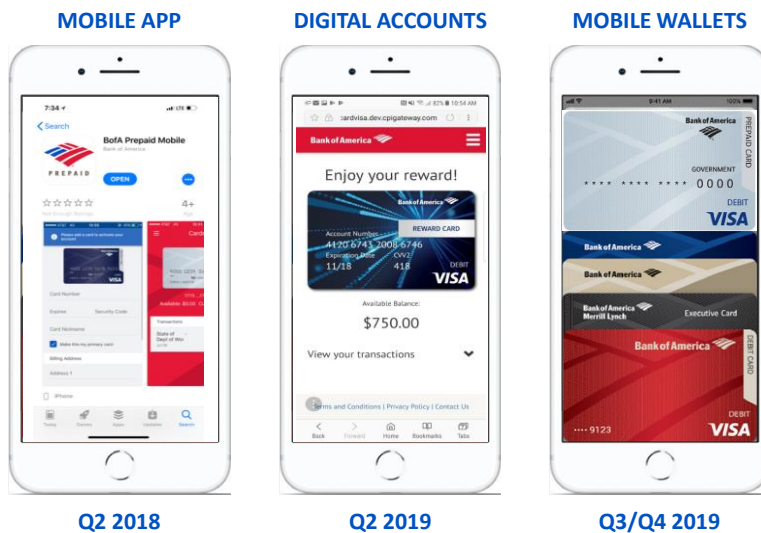
A simple process, from payer to payee.



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Prepaid digital roadmap



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Digital Disbursements



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Digital Disbursements Overview



Distribute funds electronically

Recipients receive payments more quickly

To anyone with a U.S. bank account

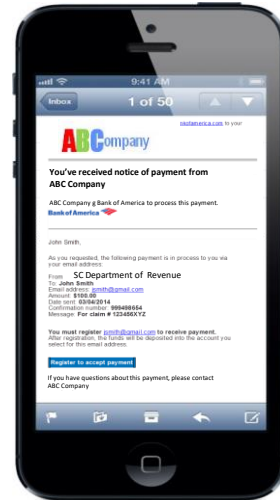
Higher customer satisfaction

Using their mobile phone number or email address

Potentially reduce payment expenses



No need to obtain recipient bank account information



14

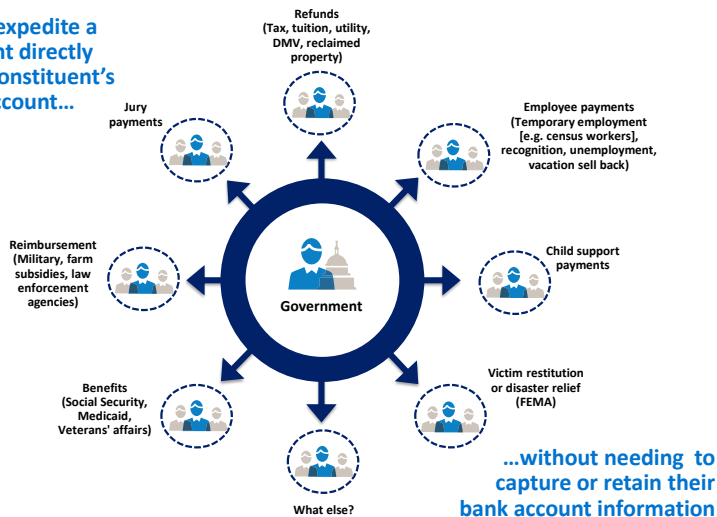
14

Digital Disbursements for the public sector



Employee and constituent applications

Use to expedite a payment directly into a constituent's bank account...

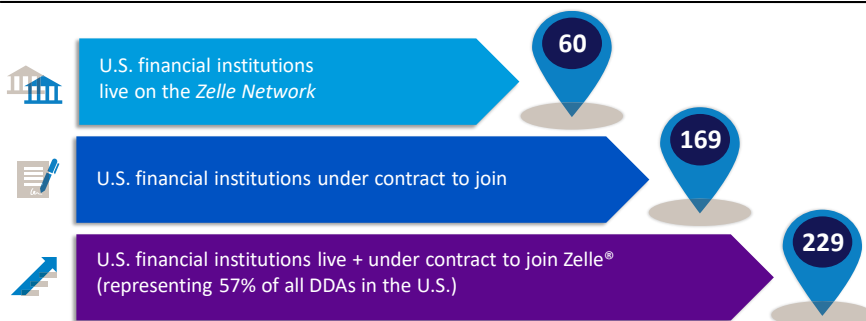


...without needing to capture or retain their bank account information

15

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The Zelle Network[®] is growing rapidly



Why is network growth important?

Growth drives user adoption
When participating banks and credit unions make Zelle available to their Mobile app and online banking services, they typically market Zelle capabilities to their consumer customers.

FAST PAYMENTS
When the recipient is already enrolled, payments arrive fast, typically within minutes

16 All Data: Q4 2018 Zelle Quarterly Statistics
Zelle and the Zelle related marks are wholly owned by Early Warning Services, LLC and are used herein under license.

16

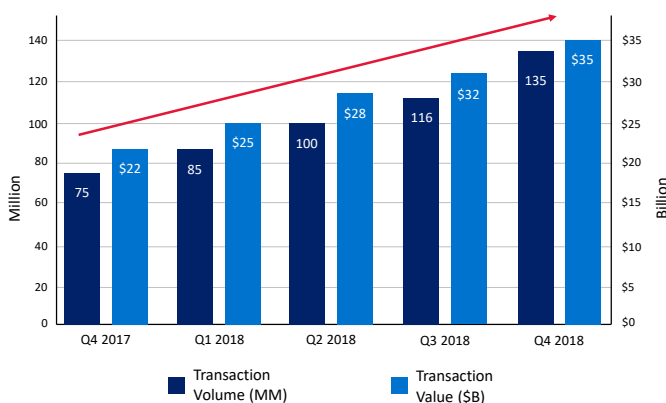
Growth

Onward and upward with rapid adoption



Strong market traction

Fast Fact: The Zelle Network® celebrated its 1st year of operation in June 2018. The network has achieved significant growth since launch.



84 Million
tokens enrolled



100,000+
new U.S. consumers
enrolling daily

17 All Data: Q4 2018 Zelle Quarterly Statistics
Zelle and the Zelle related marks are wholly owned by Early Warning Services, LLC and are used herein under license.

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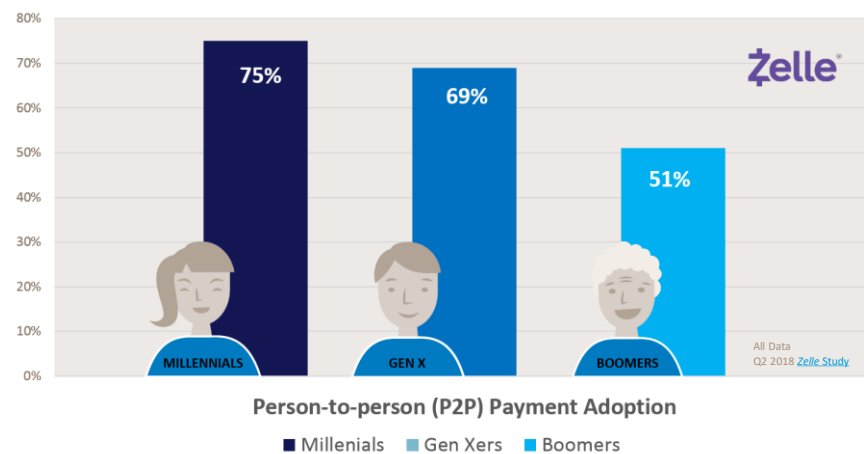
Zelle adoption and demographics

Not just for millennials



Gaining popularity across ALL generations

Significant research across 9,000 U.S. mobile-savvy Millennials, Gen Xers and Boomers who own smartphones proves mobile payment platforms are gaining traction.



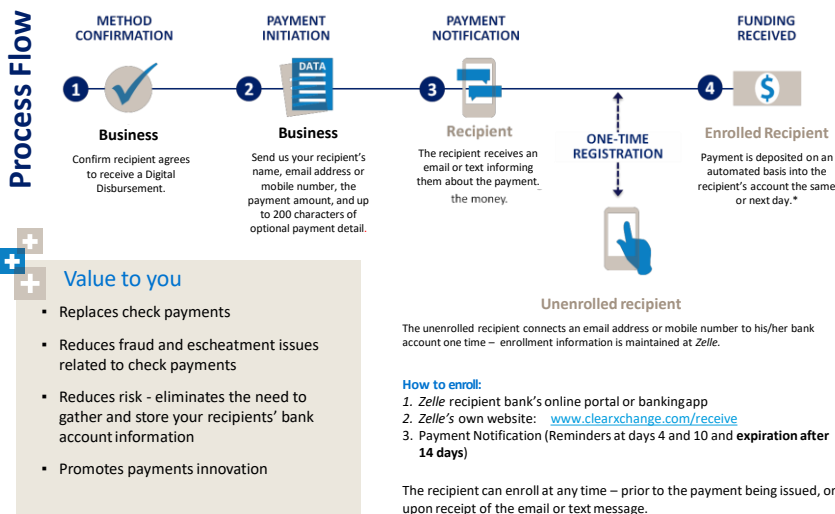
18 All Data: Q2 2018 Zelle Study
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18

Digital Disbursements (via Zelle®)



How the program works



* Please note: Refers to period of time during which payments are generally available. Enrollment required. Payments can arrive as quickly as minutes or may take up to three business days. Actual times may vary. Must have a bank account in the U.S. to use Zelle.

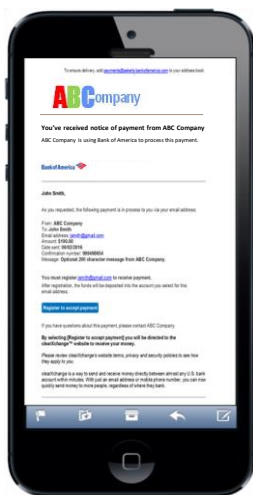
19 Zelle and the Zelle related marks are wholly owned by Early Warning Services, LLC and are used herein under license.

19

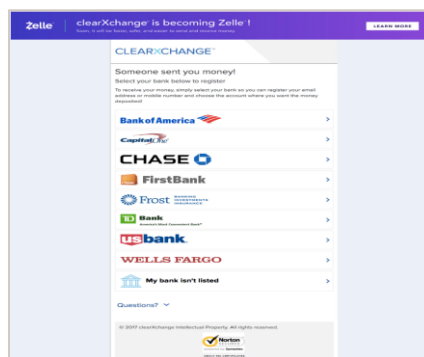
Digital Disbursements Notification to unenrolled email recipients



1 Unenrolled recipients receive notification of funds with a call-to-action to enroll to accept the funds.



2 After choosing their bank to enroll in the service, they are able to accept funds.



20

20

Digital Disbursements

Notification to registered recipients (Bank of America customer example)



Registered recipients receive notification and the funds are deposited same or next business day.*



* Refers to period of time during which payments are generally available. Enrollment required. Payments can arrive as quickly as minutes or may take up to three business days. Actual times may vary. Must have a bank account in the U.S. to use Zelle.

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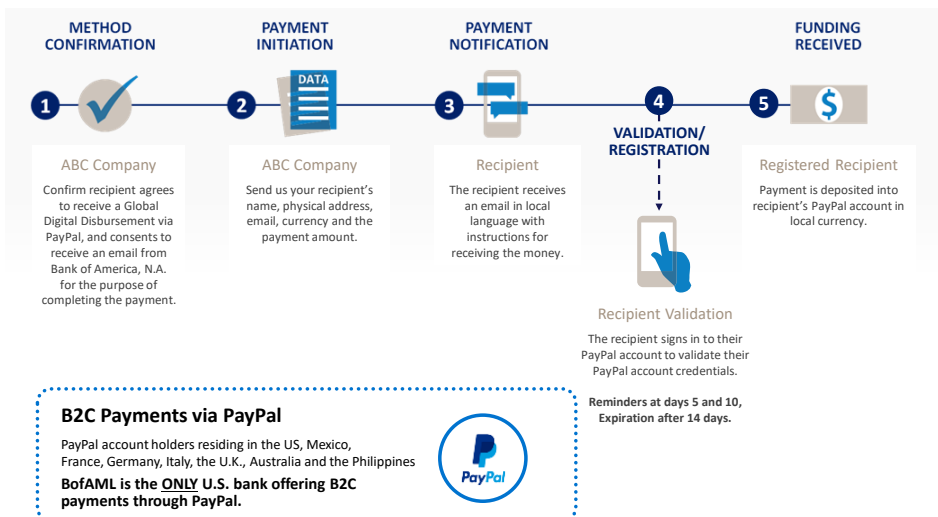
Digital Disbursements by the numbers



22

Global Digital Disbursements (via PayPal)

How the program works



23

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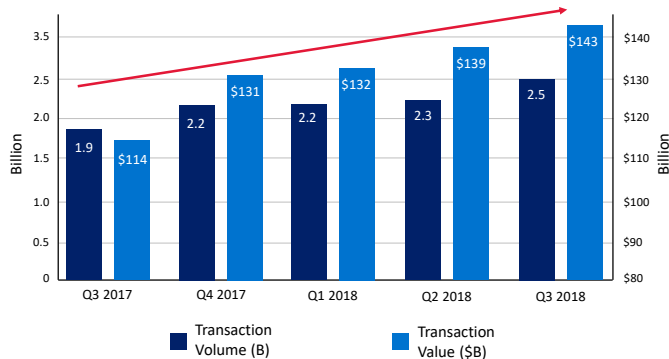
PayPal Growth

Increasing prevalence as digital payments take off globally



Established global coverage

Fast Fact: The PayPal platform, including Braintree, Venmo and Xoom, enables receipt of money in more than 100 currencies.



200+
countries & territories



254 Million
active account holders

24 Source: PayPal Quarterly Statistics; account holders and market presence as of Q3 2018

24

Application Program Interface (APIs) for Global Digital Disbursements



APIs are **sets of routines, protocols and tools** for building software applications. APIs provide **a way to connect computer software components**.



Establish protocols for interaction of both integrated and disparate technology components

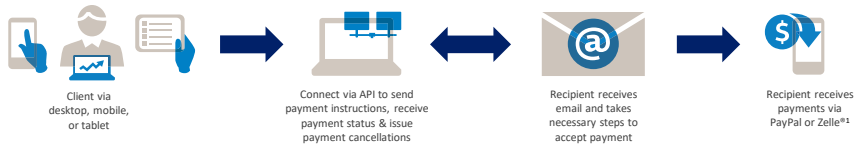


Define interfaces by which components or systems communicate



Describe the data exchange between components

Advantages	Security	How APIs can be used
<ul style="list-style-type: none"> ✓ Speed and convenience ✓ Direct interface without a website ✓ Flexibility to connect from mobile apps or other sources 	<ul style="list-style-type: none"> ✓ Dynamically generated security tokens and URLs ✓ Limited access to page sources 	<ul style="list-style-type: none"> ✓ Initiate payments ✓ Request payment status ✓ Receive payment status ✓ Cancel payment requests



25

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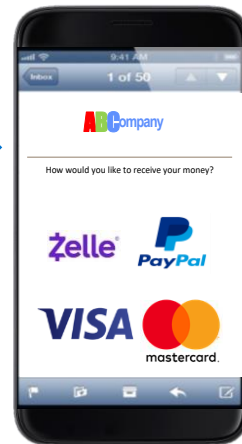
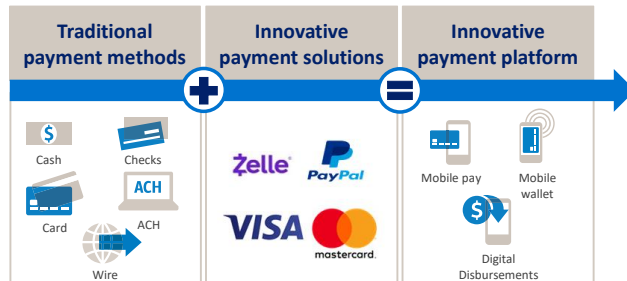
Beneficiary Choice



As payment preferences change, consumers value the ability to choose from a variety of convenient payment options.



Changing consumer payment preferences:



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U.S. Real-Time Payments

A new way to receive payments with speed, messaging capabilities and immediate availability.

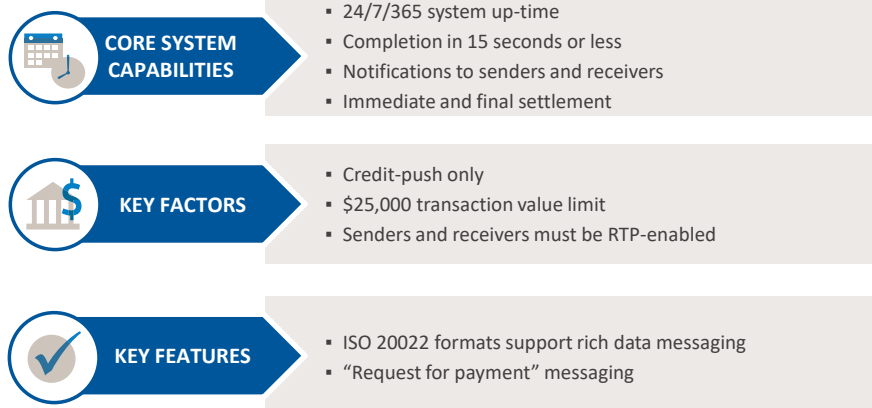
Bank of America
Merrill Lynch

27

U.S. Real-Time Payments – an overview

Bank of America
Merrill Lynch

The Clearing House Real-Time Payments system is the first new payments rail in the U.S. in over 40 years.



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Data and information



The integrated capabilities of RTP can unlock processing efficiencies and new business opportunities.


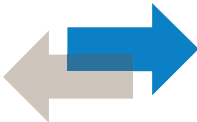


Streamlined reconciliation of payments and receipts	End-to-end paperless interaction	New insights into customer behavior
<ul style="list-style-type: none"> ▪ Unique identification numbers connect related messages ▪ Failed messages reject on origination for immediate repair 	<ul style="list-style-type: none"> ▪ Remittance data travels with payment or request ▪ Requests for information and acknowledgments reduce burden on service teams ▪ Alerts and notifications in line with increasingly mobile expectations 	<ul style="list-style-type: none"> ▪ Connected messages can show speed of customer reaction and effectiveness of outreach ▪ Maintain control of the client's entire online experience

29

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API and channel development



<p>24/7 connectivity</p>  <p>The evolution from batch file transfers, to an always-on connection</p>	<p>Simplified information flow</p>  <p>Access only the relevant information for a particular task</p>
<p>Integrated customer experience</p>  <p>Leverage direct bank connections within an online environment you control</p>	<p>Distributed work force</p>  <p>Communicate with untethered agents in real-time using your preferred systems</p>

30

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Miguel Gracia – VP Solutions Engineering - Sr. Executive with 30 years of technology experience. His expertise revolves around payment processing solutions, tokenization, Point-to-Point Encryption (P2PE) terminals, Ecommerce, network security and information security within PCI guidelines.

Miguel Gracia joined CardConnect® (a First Data company) in 2012. He supports the CardConnect Enterprise team as a Sr. Solutions Engineer and develops product solutions within the Enterprise Gateway Integration and Support groups. Miguel has completed hundreds of payment processing integrations within the CardConnect gateway. For over 20 years, Miguel has taken lead roles during the design, testing, deployment, and management of secured data networks, PCI data compliance processes and information systems, and IT departments supporting customers in diverse payment processing environments.

Miguel Gracia has an undergraduate degree in Computer Science from the New Jersey City University and a Master of Science in IT Management from the Stevens Institute of Technology.



P2PE, Security & Mobile Payments

Miguel Gracia & David Natelson
April 15, 2019

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Agenda

- › Data Breaches Continue
- › Data Security Standards
- › Risks of Handling Payment and Sensitive Data
- › Point-to-Point-Encryption
- › Tokenization
- › Mobile Payments (David Natelson)
- › Q & A

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1

Data Breaches Continue to Occur

Verizon Data Breach Investigation Report (DBIR) – Reputable resource

- Collects and reports data breach incident data (since 2007)
- Data is collected across multiple industries

2018 Verizon DBIR Report

- Over 53,000 (of which 2, 216 were confirmed) data breaches
- 73% of breaches were perpetrated by outsiders
- Small businesses and Healthcare organizations experienced the highest percent of breaches
- 58% of the breached victims were small businesses
- 48% of the breaches were related to hacking with malware
- 49% of the breaches involved non-POS malware installed via email
- 76% of the breaches were financially motivated
- 68% of the breaches took months or longer to discover



¹Security Breach State Level Legislation

- NC was one of the first states to pass laws in 2005 (Senate Bill 1048) now N.C. Gen. Stat §§ 75-61, 75-65
 - Notification to NC State Consumer Protection Bureau for breaches affecting more than 1,000 people
 - <https://www.ncdoj.gov/getdoc/81eda50e-8feb-4764-adca-b5c47f211612/Report-a-Security-Breach.aspx>
- 50 States have had security breach notification bills
- States with newly enacted legislation in 2018 - AL, AR, CA, CO, CT, HI, IA, IL, KY, LA, MD, MA, MI, MO, NE, NH, NM, NY, OH, OR, SC, SD, UT, WA, DC

² ¹Source: <http://www.ncsl.org/research/telecommunications-and-information-technology/2018-security-breach-legislation.aspx>

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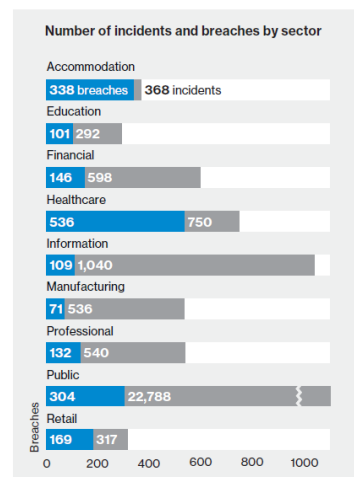
Data Breaches Continue to Occur

Data Breach Patterns Identified

- Nine emerging data breach patterns identified from data collected over a 10-year period
- Patterns:**
 - Denial of Service** (massive traffic load which disables web application access)
 - Privilege Misuse** (e.g., too many user accounts with access to sensitive data)
 - CrimeWare** (e.g., malware, keylogger, viruses)
 - Web applications** (unsecured web applications)
 - Lost and Stolen assets** (lost computers/data)
 - Miscellaneous Errors** (human error – e.g., writing down sensitive data, unsecured workstations)
 - Cyber-Espionage**
 - Point of Sale**
 - Payment Card Skimmers**
- Note:** 333,000 incidents and over 16,000 data breaches reported reveal that 94% of security incidents and 90% of data breaches fit within one of the 9 patterns.

The ²2018 DBIR report shows that:

- Point-of-Sale systems in the Accommodation industry experienced 302 breaches.
- Most of the breaches involved hacking or malware
- Web applications were targeted across all industries
- Most of the breaches occurred within physical servers and software applications



²Source: <https://enterprise.verizon.com/resources/reports/dbir/>

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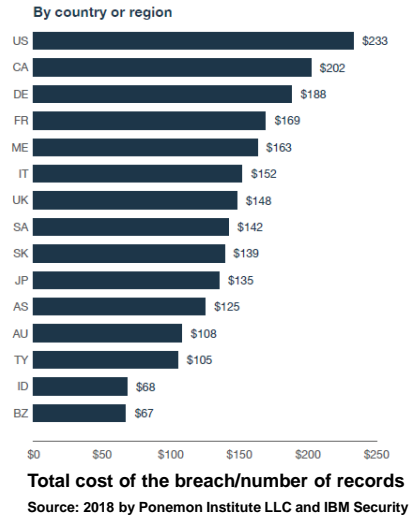
2018 Data Breaches Reported by the Media

Payment Account Data Breaches

- Saks Fifth Avenue and Lord & Taylor - 5 million records (April 2018)
- British Airways - 380,000 records (August 21, 2018 — September 5, 2018)
- Orbitz - 880,000 records (March 2018)
- Best Buy - unknown number of records (April 2018)
- Delta Airlines - unknown number of records (April 2018)
- Macy's - unknown number of records (April 2018)
- Sears/K-Mart - around 100,000 records (April 2018)

Personal Account Data Breaches

- Panera Bread - unknown number of records (April 2018)
- Ticketfly - 27 million records (May 2018)
- Google+ - 52.5 million records (March 2018)
- Quora - 100 million records (November 2018)
- Under Armour 150 million records (March 2018)
- T-Mobile - around 2 million records (August 2018)
- Adidas - unknown number of records (June 2018)
- Facebook – 29 to 50 million records (July 2017 - September 2018)
- Marriot - 500 million records (September 2018)
- 4 ▪ Aadhar – 1.1b citizens of India (March 2018), India's government ID biometric database



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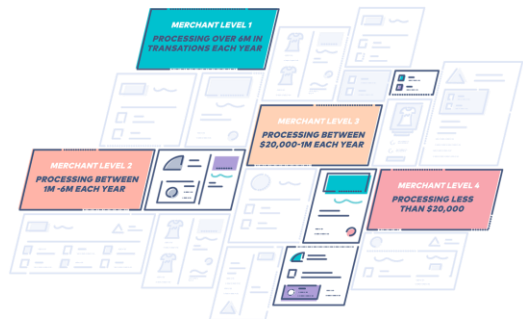
Data Security Standards

Payment Card Industry Data Security Standards (PCI DSS)

- A set of data security standards for protecting sensitive data
- Define the do's and don'ts when protecting payment card data
- Established by the Card Brands (Visa, Mastercard, Discover, Amex and JCB)
- Assist merchants in navigating the complexity of protecting sensitive payment data

Payment Card Industry Security Standards Council (PCI SSC)

- Established by the card brands in 2006
- Manages PCI DSS standards
- Manages the ongoing evolution of the PCI security standards
- Maintains focus on improving payment account security for credit card payments.
- To learn more visit Council's website at <https://www.pcisecuritystandards.org>



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Risks of Handling Credit Card or Personal Data

Risks of Fraud

- Bypassing payment data validations (postal code and CVV)
- Lacking a fraud prevention solution within Ecommerce sites

Risks of Data Breach

- Using unencrypted devices when accepting sensitive data
- Not monitoring network access against intrusions
- Lacking a process for handling data security incidents
- Accepting credit card data in clear text via web applications
- Using credit card devices with self-managed device encryption keys
- Using unsecured data networks or channels (e.g., weak Wi-Fi connectivity or passwords, taking card data over the phone)
- Storing unencrypted payment data within systems
- Overlooking human error – e.g., user account sharing, unrestricted access, untrained staff handling payment data
- Storing or transmitting encrypted sensitive data with locally stored decryption keys
- Recording card data received via phone calls (call center)

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Risks of Handling Credit Card or Personal Data

Risks of POS Malware

- Running an out-of-date POS software application
- Transmitting POS data in clear-text
- Lacking anti-virus software for all workstations
- Configuring POS workstations in a publicly accessible network
- Exposing POS systems to any user

Risks of Identity Theft

- Storing (encrypted or unencrypted) sensitive personal data
- Lacking Phishing scam training and prevention software - (The attempt to obtain sensitive data by disguising as a trustworthy entity via email or web links)
- Lacking processes to counteract Social Engineering (The art of manipulating people, so they give up confidential information)
- Lacking staff training to keep safeguards on sensitive information
- Entering sensitive data into websites that do not have a valid security certificate
- Providing unsecured open data networks that allow passing sensitive data via unencrypted channels

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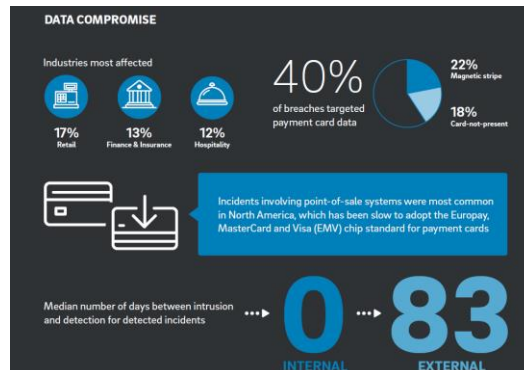
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Risks of Handling Credit Card or Personal Data

Risks of High PCI Compliance Costs

- Using non-PCI validated payment processing technologies (incurs high PCI costs while exposing a business to data breach risk)
- Lacking data security processes and technology (incurs yearly hefty compliance costs - including fines up to \$500k)
- Not selecting a payment gateway service provider that complies with PCI standards
- Not adopting a PCI scope reduction solution across all payment processing channels.



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Source: 2018 Trustwave Global Security Report <https://www2.trustwave.com/GlobalSecurityReport.html>

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Point-to-Point Encryption (P2PE)

What is Point-to-Point Encryption?

- A combination of secure devices, applications and processes to encrypt and protect data throughout the entire transaction
- Uses hardware-to-hardware encryption and decryption process
- Makes card data completely invisible within the merchant's environment.
- Solution includes merchant education in the form of a P2PE Instruction Manual (PIM)
- Encrypted data isn't decipherable to anyone who might steal it during the transaction process
- Helps organizations protect themselves and their customers from a costly data breach
- Is ranked as a high security solution by the PCI council and security experts

PCI-Validated P2PE Solution

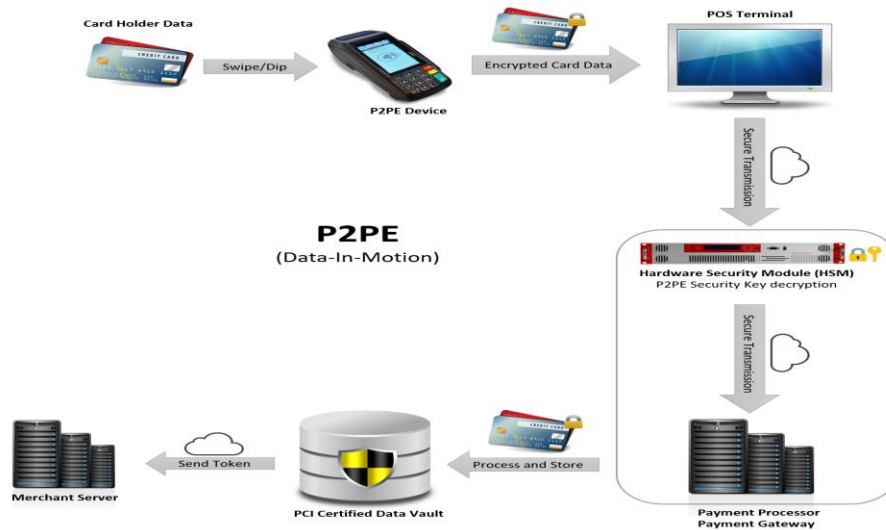
- Not all P2PE solutions are validated by the PCI Council.
- To reduce PCI scope, merchants must select a P2PE solution listed within the PCI Council website
- Non PCI listed solutions have not met the PCI P2PE standards and will not offer reduced PCI scope for a business
- Only Council-listed P2PE solutions are recognized as meeting the requirements

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Point-to-Point Encryption (P2PE)



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Point-to-Point Encryption (P2PE)

How Does P2PE Work?

- Immediately encrypts data at the point-of-interaction (POI) - as the data is keyed, dipped or swiped
- Uses strong encryption keys (e.g., TDES-DUKPT, AES, RSA, etc.)
- From the POI, the data is sent to the solution provider via a secured connection (HTTPS/TLS1.2)
- Solution provider uses a decryption key (stored within a Hardware Security Module or HSM) to retrieve the original card data
- Encryption/Decryption keys are never available to anyone but the solution provider
- Shifts data protection liability to the solution provider
- Solution provider passes the data the credit card issuing bank for authorization
- Once the transaction is processed, merchant receives the authorization status (approved/declined) along with a credit card token from the solution provider
- The merchant can store the token and re-use it for subsequent transactions. No need for retaining the original card data.



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Point-to-Point Encryption (P2PE)

PCI Council Validated P2PE Solution Benefits

- Simplifies PCI compliance efforts - fewer PCI DSS requirements.
- Saves time and money as PCI requirements are greatly reduced.
- Shorter PCI Self-Assessment questionnaire (P2PE-HW – 35 controls)
- Protects a business in the event of fraud, the P2PE Solution Provider, not the merchant, is held accountable for data loss and any resulting fines

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Tokenization

What is Tokenization?

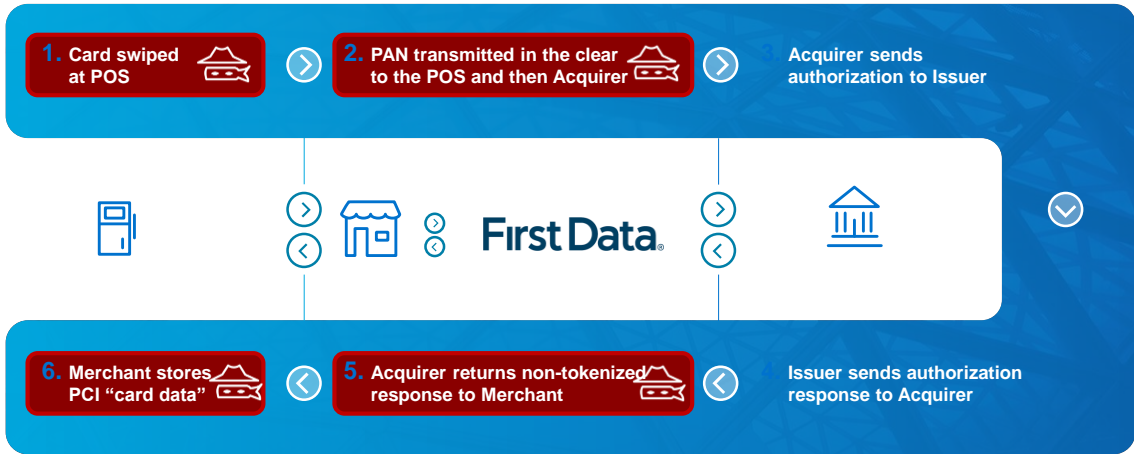
- A technology that enables the creation of data tokens for a variety of sensitive data (credit card data, SSN, email, phone, license, etc.)
- Provide the ability to detokenize sensitive data (usually not credit cards due to risk) to obtain the original data
- Is based on a unique set of encryption keys for the generation of tokens
- Exclusive tokens generated for a specific business cannot be used by another business
- Allows the exchange of tokenization requests via secure connectivity (e.g., SSL/TLS 1.2 connection)
- Often confused with point-to-point encryption (P2PE), as both solutions involve converting sensitive data into data that is useless to hackers
- P2PE is paired with tokenization to produce a randomly generated number that represents a payment card
- The token length and format vary per solution provider
- This randomly generated number can be reused to process future transactions via the solution provider's payment gateway
- A token does not contain credit card data, is not a value that can be decrypted back into the original credit card
- Credit card tokens generally reflect the last 4 digits of the credit card but may also include the first 2 or 6 digits (BIN number) of the card.
- A business can store the token without the burden of on-going PCI compliance related to storing card holder data

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Where threats lie



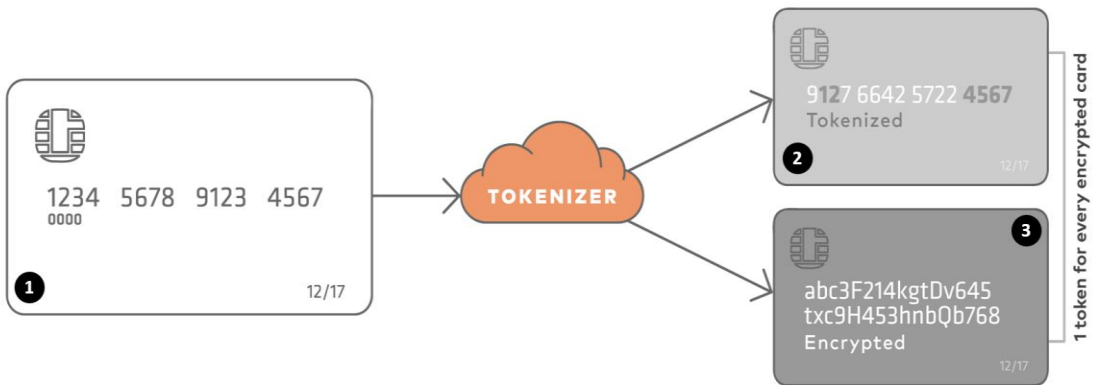
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Tokenization

Tokenization Example






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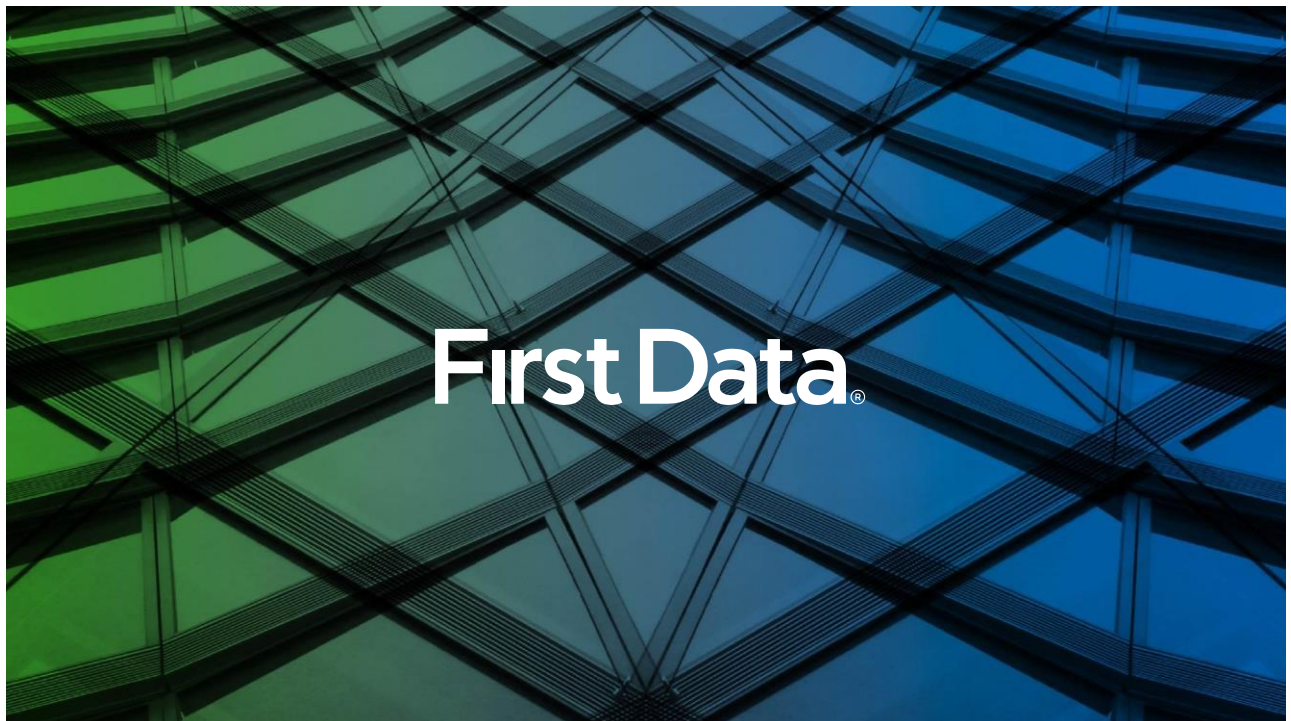
Summary – current PCI Validated P2PE Solutions from First Data

https://www.pcisecuritystandards.org/assessors_and_solutions/point_to_point_encryption_solutions

COMPANY	P2PE VERSION	P2PE ASSESSORS	REGIONS SERVED	REASSESSMENT DATE
CardConnect, LLC				
Solution Name: CardSecure P2PE				
Reference #: 2017-00113.004	P2PE v2.0	SecurityMetrics, Inc.	North America	20 Jul 2020
<p>Description Provided by Vendor: The CardSecure® P2PE Solution by CardConnect is an end-to-end encryption and PCI-validated solution. Merchants who use this solution could significantly reduce their PCI Scope while simultaneously increasing their security. Compatible with any sales channel, this solution ensures that data is encrypted upon read rendering it useless to any malware that may be downstream. The CardSecure P2PE Solution ensures that no merchant has access to encryption keys, and that CardConnect manages them in a PCI-compliant manner. This solution substantially reduces merchant risk and is future-proofed with EMV and NFC functionality. CardConnect is a leading provider of payment technology and processing services, with customers ranging in size from Fortune 50 corporations to corner stores and small businesses. Securing cardholder data is a cornerstone of our offering, and it provides a substantial value proposition for our merchants because it reduces their PCI Scope.</p>				
 <p>ISC Touch 250 Features: EMV, NFC, Apple Pay, Touchscreen, Signature Capture</p> <p>IPP350/320 Features: EMV, NFC, Apple Pay</p>				
First Data Merchant Services				
Solution Name: First Data TransArmor P2PE Solution - Ingenico On-Guard				
Reference #: 2018-00541.001	P2PE v2.0	Syxnnet Limited, dba Syxnnet Global Solutions	North America	4 Jan 2022
<p>Description Provided by Vendor: First Data's TransArmor P2PE Solution is part of a comprehensive, multi-layered security solution covering all PCI card brands. The TransArmor P2PE Solution, with Ingenico's On-Guard encryption, allows integrators tremendous implementation flexibility using legacy integrations; and can reduce the scope of merchant data subject to PCI compliance. This cost-effective solution is available for most verticals including retail, restaurant, QSR and healthcare.</p>				
 <p>Ingenico iSC250 Touch, iSC480, iPP320, iPP350, iPP310</p>				
Clover Network Inc, a wholly-owned subsidiary of First Data Corporation				
Solution Name: Clover				
Reference #: 2017-00893.001	P2PE v2.0	Payment Software Company (PSC)	Worldwide	30 Oct 2020
<p>Description Provided by Vendor: Clover's payment processing solutions let you accept credit cards, EMV chip and contactless payments from customers, safely and securely. Clover's P2PE solution combines the security of Clover devices with TransArmor encryption. TransArmor protects payment card data in Clover devices throughout the entire transaction process since data is encrypted from the moment you dip, swipe, tap, or sign.</p>				
 <p>Clover Mini Accept swipe, EMV chip and NFC payments right out of the</p>				

Look for more brands and devices in 2019...

First Data.





Kay Griep
Vice President, Treasury Product Manager
Global Transaction Services

Treasury product manager for the Digital Disbursements and Global Digital Disbursements suite of services within Global Transaction Services (GTS) at Bank of America Merrill Lynch. As product manager for this award winning B2C payments solution, is responsible for product management and strategy development, including product features and functionality.

Bachelor of Science degree in Accounting from Appalachian State University in Boone, NC

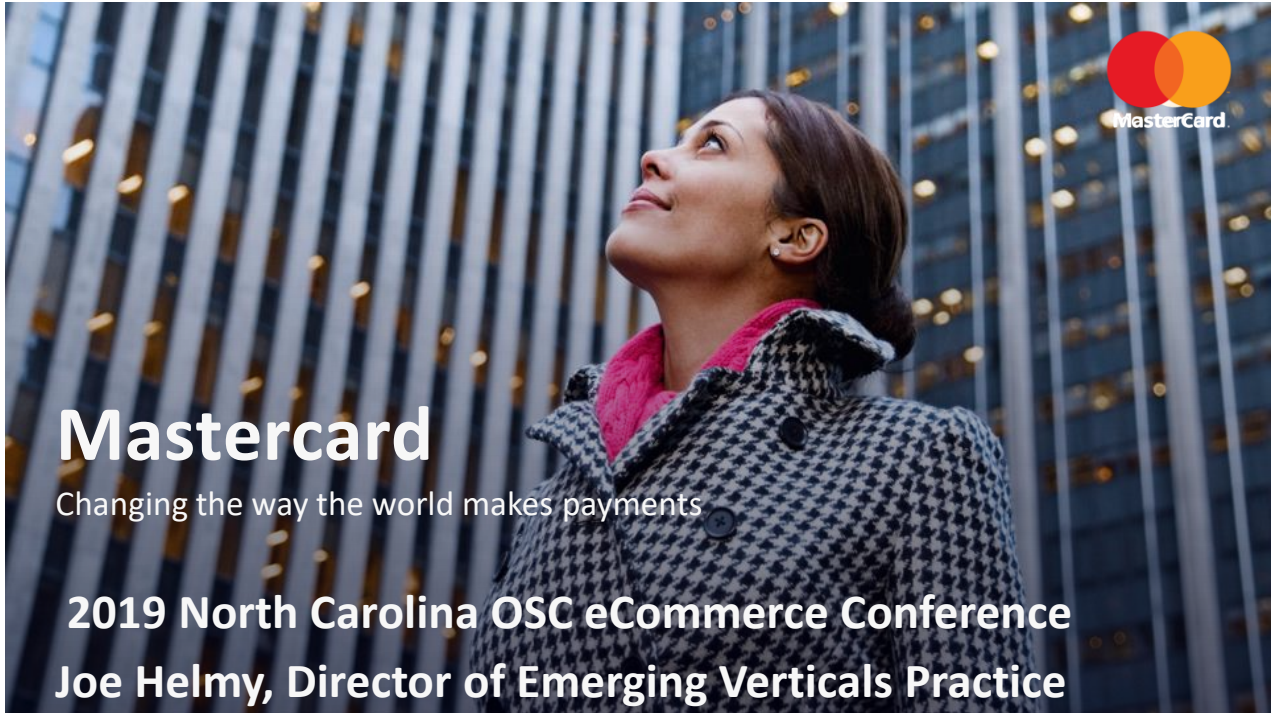
Certified Public Accountant with over 23 years' experience with Bank of America in Accounts Payable, Project Management, Check and Digital Disbursements Product Management.



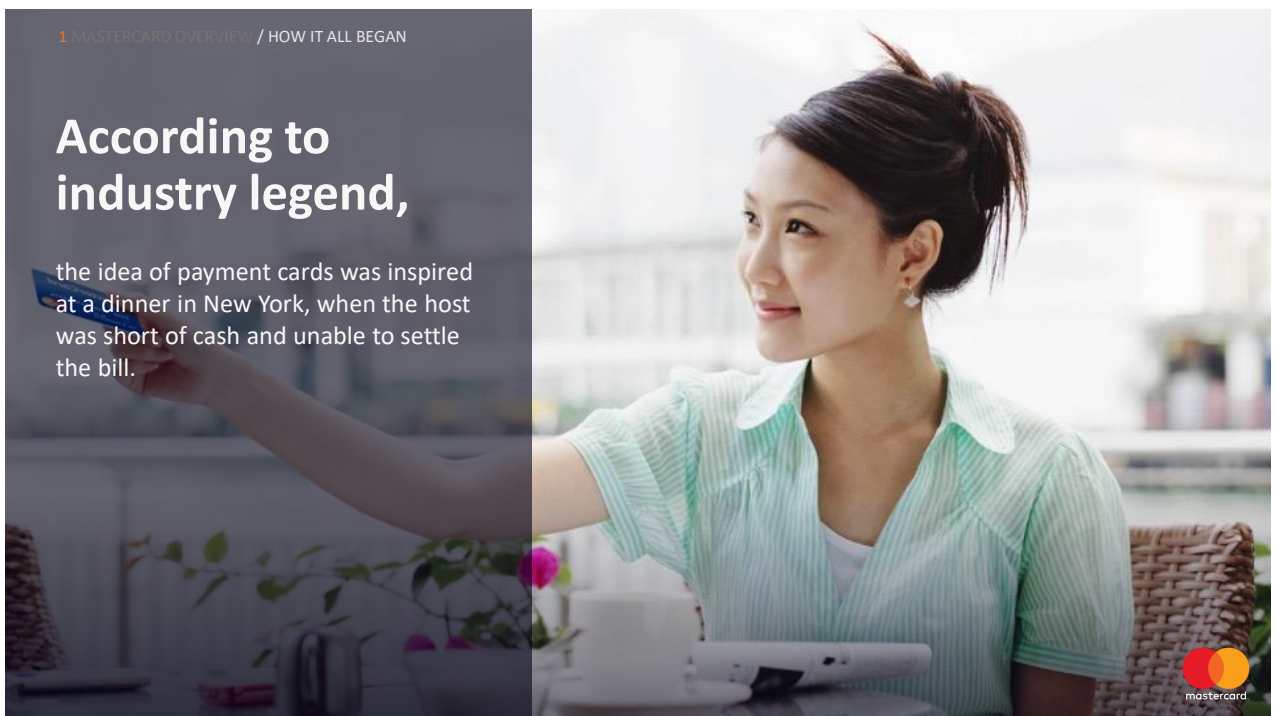
Joe Helmy currently serves as the Director of Emerging Verticals for the Government, Education, Parking, Charity, and Logistics verticals at Mastercard, where he is responsible for developing and delivering strategies and solutions for a wide range of education institutions, government agencies, from the smallest to the largest, as well as services providers who tailor to these organization. Joe takes great pleasure is using his consultative approach to helping these merchants' meet their needs and exceed their goals, year after year.

Joe joined Mastercard in early 2015 from American Express, where served the same industries for over 5 years. Prior to entering this space, Joe was with PricewaterhouseCoopers as an Advisory Consultant, helping to define and create the online and mobile customer experiences for many Fortune 500 companies, the United Nations, and other notable organizations.

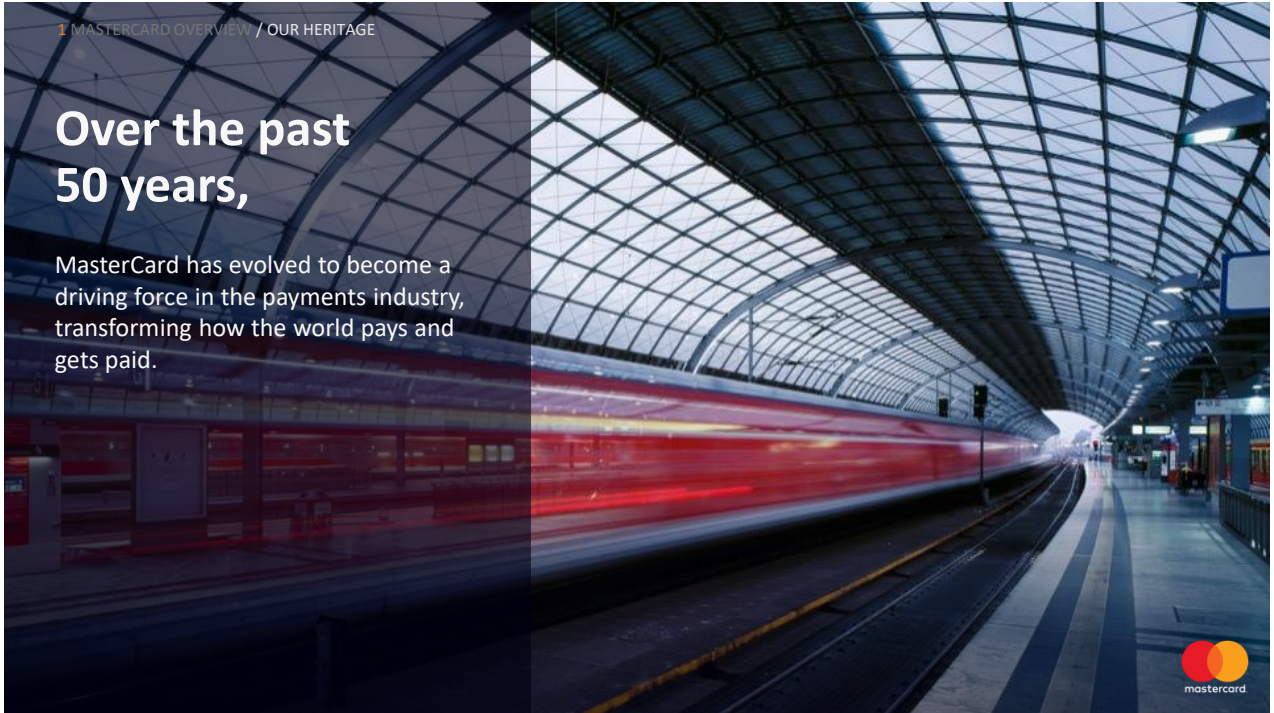
Joe is a MBA graduate from the University of Notre Dame's Mendoza College of Business, he received his BS from the New Jersey Institute of Technology. He currently resides in Westwood, NJ with his wife, 2 kids, 2 dogs, and is expecting a baby in late April.



1



2



1 MASTERCARD OVERVIEW / OUR HERITAGE

Over the past 50 years,

MasterCard has evolved to become a driving force in the payments industry, transforming how the world pays and gets paid.

3

1 MASTERCARD OVERVIEW / OUR HERITAGE

Mastercard Milestones

1960s	1970s	1980s	1990s	2000s	2010s
<p>1966 A group of banks creates the Interbank Card Association (ICA) for the reciprocal acceptance of credit cards.</p> <p>1968 Financial institutions from Mexico, Japan, and Europe join ICA.</p> <p>1969 ICA acquires the Master Charge name and interlocking circles trademark.</p>	<p>1979 Master Charge becomes MasterCard.</p>	<p>MasterCard is the first payment card issued in the People's Republic of China, and the first to introduce a laser hologram on cards.</p> <p>The first MasterCard business card is launched.</p>	<p>In partnership with Europay International, MasterCard launches Maestro, the world's first global online debit program.</p> <p>1997 MasterCard launches Priceless® campaign.</p>	<p>2001 MasterCard Advisors is launched.</p> <p>2002 MasterCard integrates with Europay International and becomes a private share corporation.</p> <p>2006 MasterCard transitions to a new corporate governance and ownership structure and begins trading on the NYSE under ticker symbol MA.</p>	<p>2008-2012 Keenly focused on driving innovation, MasterCard acquires Orbiscom, DataCash, the prepaid program and management business of Travelex (Access Prepaid), Trevica and Truaxis.</p> <p>2010 MasterCard Labs is established, which serves as an incubator for new ideas.</p> <p>2013-14 MasterCard introduces MasterPass. Acquires Provus, ECS, C-SAM, Pinpoint, TNS and Sone. MasterCard works with Apple to launch Apple Pay.</p> <p>2015 MasterCard acquires Applied Predictive Technologies and assists with the launch of Samsung Pay.</p>

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1 MASTERCARD OVERVIEW / MASTERCARD TODAY

Our Vision

A WORLD BEYOND CASH™

From major cities to emerging markets, we are stimulating economies and changing the way the world does business.



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1 MASTERCARD OVERVIEW / MASTERCARD TODAY

Our Mission

Every day, everywhere, we use our technology and expertise to make payments safe, simple and smart.





6

THE ADVANTAGE WE DELIVER

The Advantage We Deliver

- **Unified** global organization
- **Fastest** global processing platform
- **Powerful** brands and Priceless offers
- **Innovative** payment solutions
- **Security** expertise
- **Strong** relationships
- **Unique** advisory capabilities
- **Talented** employees



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Our Business



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OUR BUSINESS / BUSINESS TRANSFORMATION

Payments Innovation

Our **innovations** support opportunities for new payment services and safer, seamless and more convenient payment experiences.

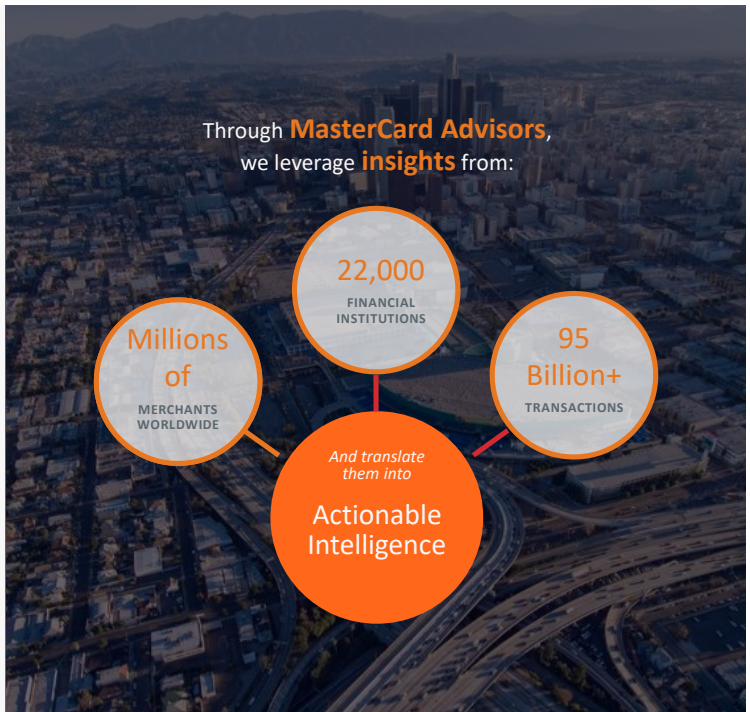


OUR BUSINESS / STRATEGIC CONSULTING

Consumer Data and Insights

By combining reliable transaction data with analytics, we offer unparalleled global consulting advice that can drive revenue growth, marketing efficiencies and business optimization.

Advisors does not sell the transaction data, but instead maximizes aggregated, anonymous data to deliver actionable insights.



OUR BUSINESS / AWARDS

Global Recognition

Fortune

- #6 of Top 25 Blue Ribbon Companies
- #11 of Top 50 Change the World Companies
- World's Most Admired Companies
- #5 of World's Top 50 Business Leaders (Ajay Banga)

Innovation Project®

PYMNTS Innovator Award for Best New Technology

Millward Brown

#20 of BrandZ Top 100 Most Valuable Global Brands

Forbes

#36 World's Most Innovative Companies

Barron's

#8 of Top 100 World's Most Respected Companies

Harvard Business Review

Best-Performing CEOs of the World

Ethisphere

World's Most Ethical Companies (2016)

All recognition awarded in 2015 unless stated otherwise.



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OUR BUSINESS / AWARDS

Workplace and Diversity Recognition

Human Rights Campaign

Best Places to Work

DiversityInc.

#7 of Top 50 Companies for Diversity (2016)

ComputerWorld

#1 of 10 Best Finance Companies to work for in the U.S.

LinkedIn

The World's 100 Most In Demand Employers (2014)

National Association for Female Executives

Top Companies for Women

Working Mother

100 Best Companies

Hispanic Network Magazine

Best Places to Work

All recognition awarded in 2015 unless stated otherwise.



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OUR MARKETING POWER / PRICELESS PLATFORM

Priceless

MasterCard's highly regarded Priceless campaign crosses borders and cultures and connects people to priceless possibilities.

112
countries

53
languages

- PRICELESS ADVERTISING
- PRICELESS CITIES®
- PRICELESS SURPRISES®
- PRICELESS CAUSES®

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Our Strategy



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OUR STRATEGY / STRATEGIC OUTLOOK

Growth Drivers

Mastercard's growth is influenced by four primary factors:

- Personal consumption expenditure growth
- Shift to electronic forms of payment from cash and check transactions
- Mastercard share of electronic payments
- Value-added products and services



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OUR STRATEGY / STRATEGIC OPPORTUNITIES

Key Trends

- **Financial inclusion**
- Continued **urbanization**
- Growing importance of **youth**
- Growing **affluent** and **middle class**
- Ubiquity and reliance on **smartphones**
- Growth of **e-commerce** and **omni-channel shopping**
- Growth of **digital payments**
- Consumer concerns about **fraud**



OUR STRATEGY / OVERVIEW

Our Strategy

Our strategy is to grow our share of commerce through innovation and execution. We drive our strategy by growing our core businesses, diversifying geographies and customers, and building new businesses.



Grow

CORE BUSINESSES
FASTER THAN MARKET



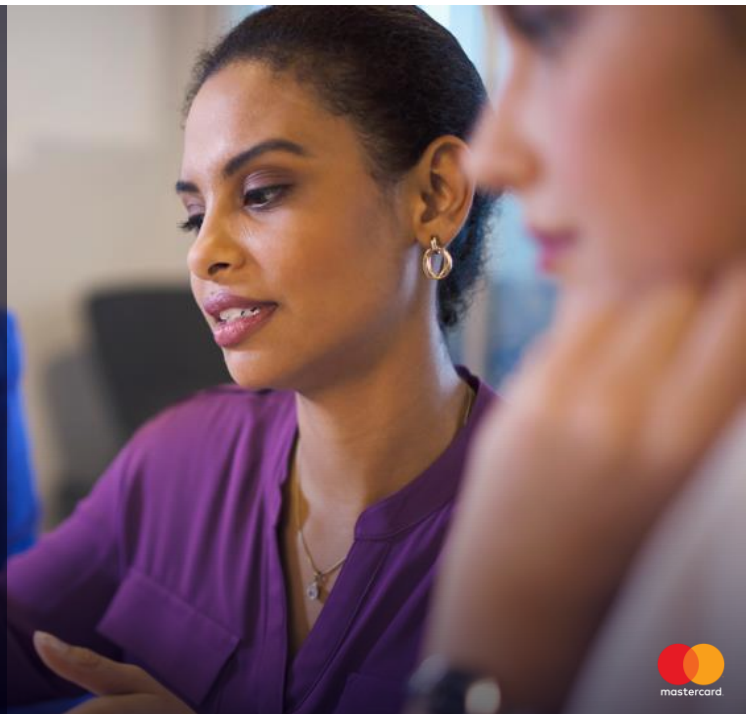
Diversify

CUSTOMERS AND
GEOGRAPHIES



Build

NEW, HIGH-GROWTH
SCALABLE BUSINESSES



OUR STRATEGY / LEADING WITH SERVICES

Mastercard Advisors

Our global consultancy provides clients with insights and solutions that **drive business impact** and **ROI**.

With analyses based on more than 80 billion anonymous transactions, Advisors leverages aggregated information and a consultative approach to help financial institutions, merchants, media companies, governments and other organizations grow their businesses.



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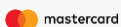
OUR STRATEGY / LEADING WITH SERVICES

Other Value-Added Services

Prepaid Management Services – end-to-end global prepaid card programs for large or small companies that are backed by our safety, security and global acceptance

Payment Transaction Services – acting as a fully integrated technology partner to issuers and acquirers, we provide the back-end technology, service and support needed to make payments happen

Payment Gateway Services – delivering new and different ways to pay online and provide merchants with truly global connectivity

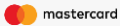


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OUR STRATEGY / FOCUS ON INNOVATION

Mastercard Labs

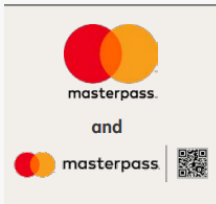
Supporting **breakthrough innovation** efforts is at the heart of differentiating MasterCard from our competitors and key to sustaining our competitive advantage in the marketplace.



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Our strategy – enable our customers and partners to be at the forefront of digital payments

Delivering the **best digital experience** everywhere



Securing every transaction

Mastercard Digital Enablement Service, Biometrics and Machine Learning

Digitizing all forms of personal and business payments

Mastercard Send and **VOCALINK**

Simplifying access to, and integration of, our digital assets



Identifying and **experimenting with future technologies**, start-ups & trends



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Scale services

Driving core product differentiation and incremental revenues

Advisors



Over 50% of customers use our project-based consulting services

Data & Analytics



Over 60% of customers use our data & analytics solutions

Fraud Solutions



Almost half of transactions benefit from our optional fraud scoring solutions (a 50% increase over last year)

Loyalty



65+ million accounts managed on our loyalty platform

Processing



Enabling digital payment and IoT strategies for merchants

Labs as a Service



30+ customer Launchpad events since January 2016



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Meeting
Expectations in a
Digital-First World

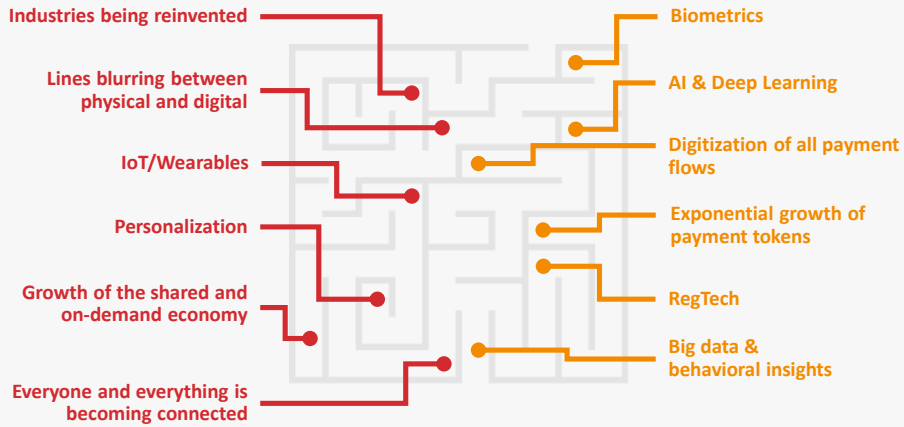


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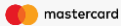
DIGITAL – WHAT IS HAPPENING?

New technology and changing trends are complicating how businesses operate to meet consumer expectations

customer experience



safety and security



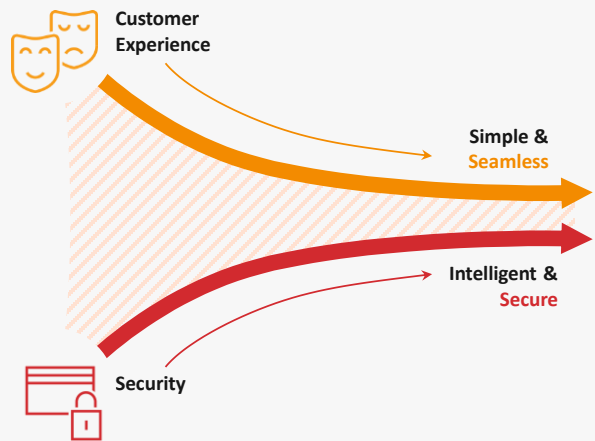
MEETING EXPECTATIONS IN A DIGITAL-FIRST WORLD

CHALLENGE AND CONTEXT

Technology is also pushing security and experience to be one and the same

You can no longer choose between a great customer experience and great security

Mastercard believes that experience should be designed to be secure, and security designed to be seamless



POSITIONING

Build stronger relationships with all of your customers by making a completely connected experience that is secure and seamless

SECURE

Every fraud decision invisible, data driven, and intelligent

SEAMLESS

Every transaction simple for all of your customers and flows



Giving customers the choice to pay securely anytime and from any device



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SECURE SOLUTIONS

Using data and artificial intelligence to approve more legitimate transactions and eliminate friction from the cardholder experience



NuDetect

Aggregated behavioral intelligence using machine learning and billions of data points to provide pinpoint accuracy in distinguishing genuine from fraudulent user behavior



Mastercard ID Check

A set of rules and standards that are designed to ensure a consistent consumer experience for 3D-Secure authorization via mobile devices and in app payments.



Assurance IQ

Consolidated and normalized consumer account and device data to provide a level of assurance that the consumer's attributes are genuine without increasing risk

Authentication

Authorization

Secure every transaction with a data driven, layered strategy



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SEAMLESS SOLUTIONS

Making every transaction simple for consumers no matter how or where they choose to pay



Automatic Billing Updater (ABU)

Updates and delivers PAN level details on stored accounts to help reduce preventable declines and provides uninterrupted service



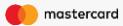
MDES for Merchants (M4M)

Updates and delivers tokens to substitute for PANs over time and help reduce fraud while providing uninterrupted service



Masterpass by Mastercard

Expand your digital acceptance footprint with a simple, secure and more trusted way to process payments across channels



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REASON TO ACT

Mastercard digital solutions give you the tools you need to stay ahead in the age of digital commerce



Automatic Billing Updater (ABU)



MDES for Merchants



NuDetect



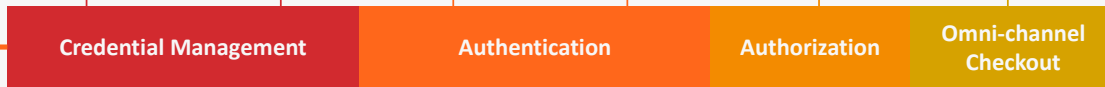
Mastercard ID Check



Assurance IQ



Masterpass



Intelligent security converged with a seamless customer experience from start to finish

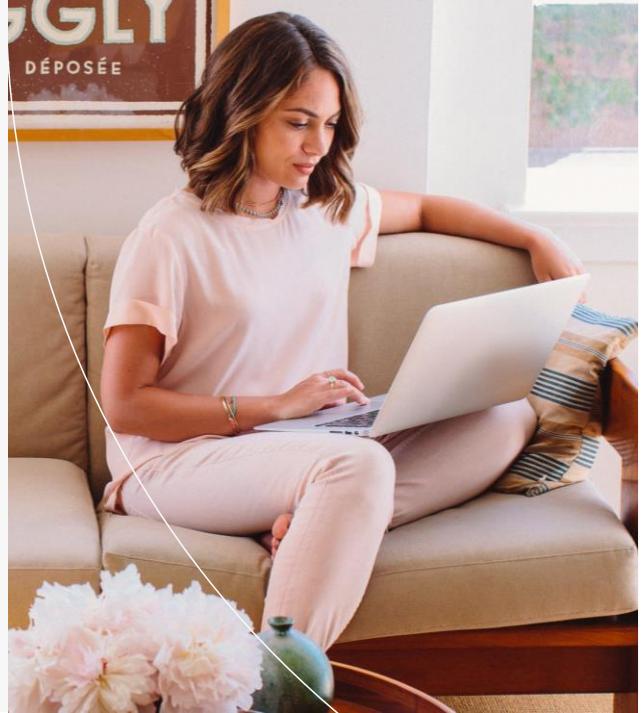


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MDES for Merchants

Building a more seamless and secure lifecycle management solution with Mastercard Digital Enablement Service and Automatic Billing Updater.

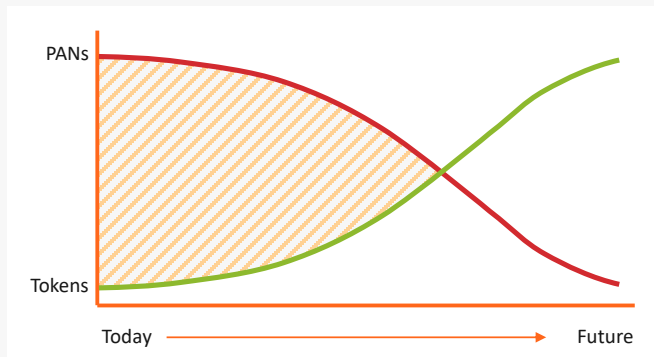
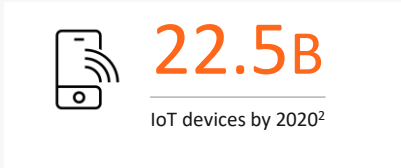
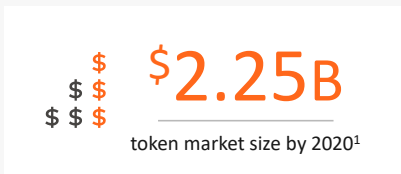


Merchant Introduction

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LANDSCAPE

Tokenized payments will continue to grow at a rapid rate, but card-on-file payment types will be mixed for some time.



1. Source: Research and Markets: Tokenization Market by Solution, Service, Application Area, Deployment Mode, Organization Size, Vertical, and Region - Global Forecast to 2022
 2. Source: BI Intelligence Report: Internet of Things (2017)



MDES FOR MERCHANTS

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CONSUMER PAIN POINTS

And while consumers like the convenience of card-on-file, the fear of security breaches still looms large.

55%

use card-on-file¹, and 43% believe that the retailer is the primary party responsible for protecting the information²

81%

say they are at least somewhat concerned about security of their saved cards²

1 in 3

have been a victim of data breaches, identity theft or credit card fraud²

1. Mastercard Global E-Commerce Research, 2016
2. Glenbrook research for Consumer Control



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MERCHANT PAIN POINTS

High security without a seamless experience can negatively impact revenue.

Digital fraud rate is higher than POS



Leading to unnecessary false declines

13x

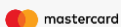
the amount of actual fraud²

Which cost the bottom line

66%

Reduced or stopped shopping with that retailer after a false decline²

1. Source: Mastercard Data Warehouse, Q1-Q3 2016, Global.
2. Javelin. Overcoming False Positives. September, 2015.



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REASON TO ACT

False declines are diverting resources and undermining the merchant's ability to effectively combat fraud.

US ecommerce merchants:

Lose
\$8.6B
 in falsely declined transactions³

Spend
7.6%
 of retailer revenue fighting fraud on average²

Spend
\$172
 per account following a breach¹

1. Source: EMS Fraud Scoring savings model: Data based on Mastercard transactions only, overall market results may vary by Institute June 2016
 2. Source: Javelin report: The Financial Impact of Fraud, October 2016
 3. Source: <http://www.businessinsider.com/the-false-declines-report-the-86-billion-problem-undermining-e-commerce-merchants-fraud-prevention-strategies-2016-7>



POSITIONING

M4M and ABU together provide seamless and secure lifecycle management of PANs and Tokens.

Reduces preventable PAN declines on stored accounts caused by changed account numbers, expiration dates, and more.

Automatic Billing Updater

Automatic updates to PANs for a seamless experience

MDES for Merchants

Automatic updates with a layer of enhanced security

Provides network tokenization of card-on-file credentials and seamless updates to the funding PANs.

Source: Pheonix, 2015 U.S. "How Smartphone Purchasers Pay Online"



COF MANAGEMENT FROM MASTERCARD

Future ready, today: seamless account updates for PANs, tokens or a mix of both.

Simplicity

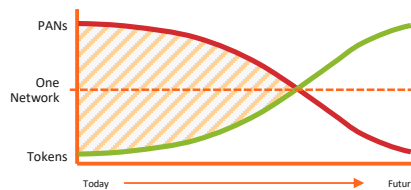
Lifecycle management across the entire Mastercard network – PANs and tokens

Reliability

Regardless of commerce platform, COF management is secure and reliable

Scale

Token and PAN updates at tiered volumes with one network



MDES FOR MERCHANTS

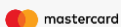
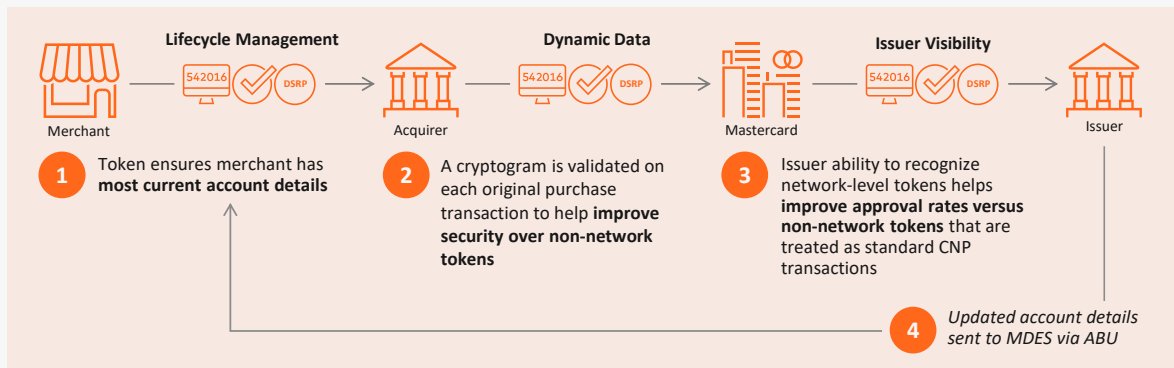
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HOW IT WORKS: M4M

Network tokenization offers a new level of security, transparency and potential benefit

M4M Tokenization (*direct integration with merchant*)



MDES FOR MERCHANTS

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My Digital Life Introduction

Establishing the Digital Foundation for New Services
April 2019



Digital Identity is Foundational To Native Digital-First Services



2019→2023

Digital Identity is Foundational to digital payments & digital interactions

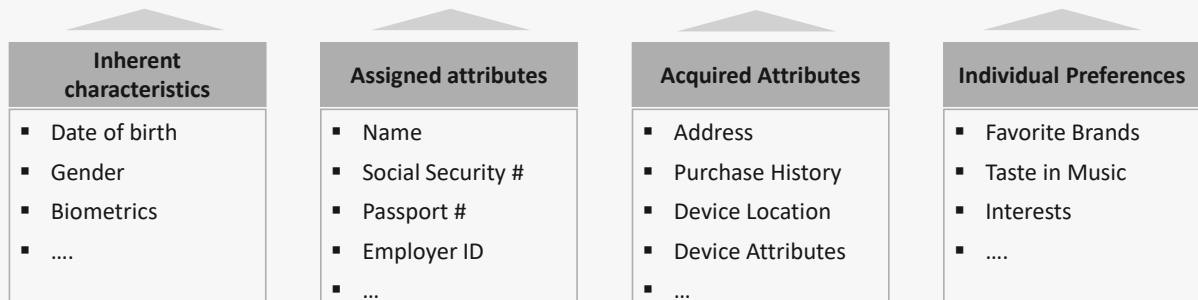
Trends Accelerating Digital Identity Need

- Best Practice Bar Raised for Security and ID&V
- User Expectations: Simple, Secure, Private
- Connected Devices & Complexity
- GDPR+ Regulations Globally
- User for Open Banking, Open Data
- AI Drivers to New User Services
- Urbanization and Smarter Cities
- 7.5B User Relevance: Inclusion Markets
- Embedded Digital Commerce Growth
- Drivers to User Centric, Distributed Systems



What is Digital Identity?

- **Digital Identity = The collage of data verified by trusted parties** and that is a digital means of establishing ‘*we are who we say we are*’ with a **high degree of assurance** (i.e. proves “John is John with X% accuracy”)
- **Reusable Digital Identity** allows individuals to identify themselves to gain access to multiple services with speed, convenience, and security – based upon verification of both **static and dynamic** identity data



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Compelling Value Proposition with a Reusable Digital Identity

For Users:



- **Easy user experience** with 1 time enrollment
- **Secure, No Password** use of tokens for authentication
- **Ubiquitous acceptance**, high value, high frequency use-cases
- **Consumer control over data**: ID, consents, digital footprint, data
- **End point device flexibility** across all life-stages and situations

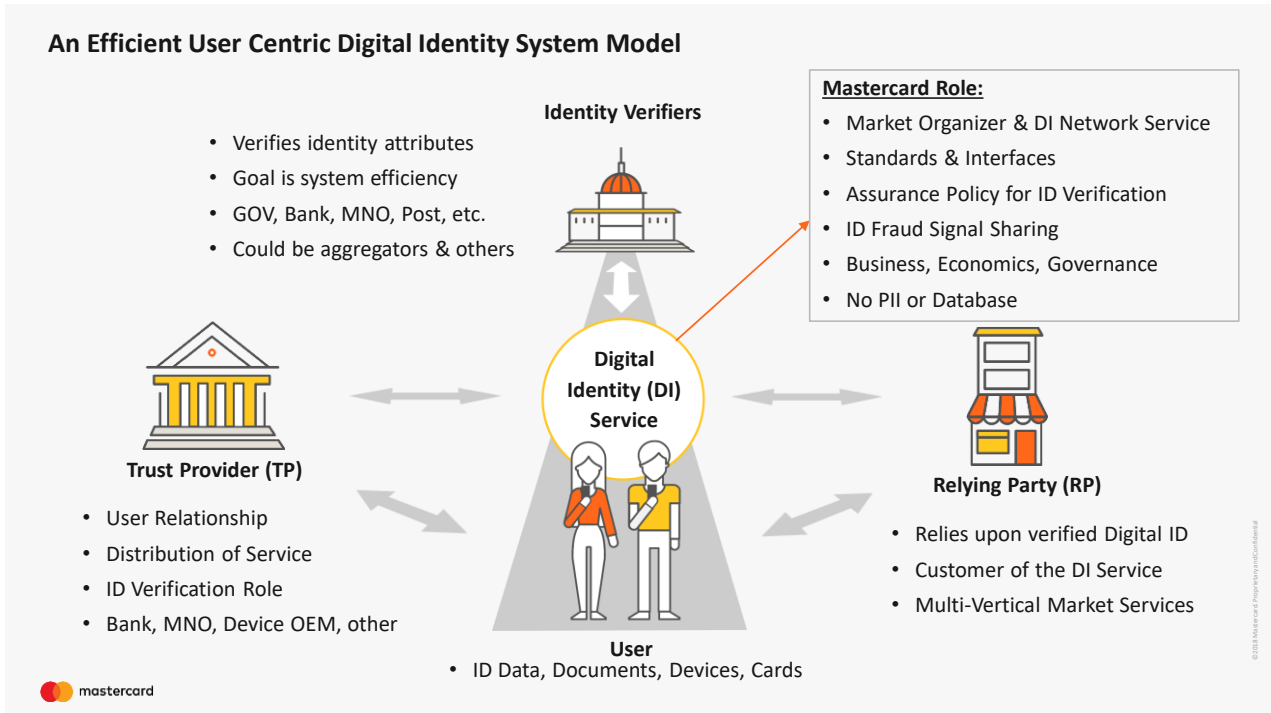
For Customers:



- **Broadly adopted, high assurance user digital identity**
- Fast, resilient, on-demand; **supporting data minimization**
- Efficient, Transparent, **Globally Interoperable**
- Flexible levels of identity verification (**dynamic, biometric**)
- **Extensible and adaptable** service to plug-in



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Mastercard Perspective

See digital identity vision paper: mastercard.com/digitalidentity

Vision

“As a **user champion**, provide simple & secure **digital identity services** for users interacting with application services **across multiple verticals** (payment, non-payment) **and countries** that enable them to be known with assurance, in a manner sensitive to their **privacy and data rights**.”

Broad Market Collaboration Essential

- Primary ID Verification: Bank, GOV, MNO, Post, ...
- Government Alignment
- Bank Partnerships: Trust Provider, ID Verification
- Focus upon core natural industry roles

Our Role

- Orchestrating digital interactions as a user champion
- Establish the service platform, network
- Define the operating rules & governance
- Deliver and operate the service with partners
- Attract and service customers

Our Relevance

- Global footprint across over 200 country markets
- 23,000 bank partners; 50 million merchant relationships
- Experience in governance and operating networks
- Commitment to invest in a global infrastructure
- Evolution of digital payment interactions

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Compelling Use Cases – Supporting My Digital Life ...Simple, Transparent, Safe, Fast



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David Natelson **Vice President, Government Solutions**

David joined First Data in October 2014 as Vice President of Government Solutions. In 2014 he was responsible for the Government Solutions Payment Products team which is based in Cincinnati and has employees there plus in Denver, Chicago, Austin, and Omaha. He also managed the State and Local Government/Higher Education Eastern Region Sales team – National Account sales and Relationship Managers. Currently, David manages a team of Account Executives and Sales Executives that support State and Local Government, Transportation, Education, and Utility clients in the eastern half of USA.

Prior to First Data, David served as the President and COO of Nasatka Security, a premier manufacturer in the physical and electronic security marketplace. Before that he was a Vice President of Sales at two startups, one focused on Governance, Risk Management and Compliance (GRC) for Fortune 500 and large Government SAP, Oracle, and PeopleSoft clients and one in the Aerospace and Defense area. David spent the majority of his career (15 years) at Oracle Corporation. While at Oracle, David's responsibilities included Product Development, Oracle Consulting, and Oracle Sales/Sales Management. His last position was Vice President of Applications Sales (ERP/CRM) for the U.S. Public Sector Vertical.

David has a Bachelor of Science degree in Mathematics and Computer Science from Vanderbilt University and a Master of Science in Computer Science from The John Hopkins University. He lives in the Tampa Florida area and has three sons, ages 20, 23 and 26.

His publications include "Electro Optic/InfraRed laser illumination sensors for perimeter security" Proc. International Society for Photonics and Optics (SPIE) 6538, Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security and Homeland Defense VI, 65381H (4 May 2007); doi: 10.1117/12.722137.

Mr. Natelson has spoken at Conferences including the annual conferences of the National Association of State Comptrollers, Auditors, and Treasurers (NASACT), Federal of Tax Administrators (FTA), Government Finance Officers Association (GFOA), and Oracle OpenWorld/OAUG, SPIE, IFSEC International, and ASIS Middle East.

Jessica Nye, Supervisory Special Agent, FBI

Supervisory Special Agent Jessica Nye is the current Supervisor of the FBI Cyber Squad in Raleigh, NC. Prior to her arrival in NC in 2015, Special Agent Nye spent eight years working in the Baltimore Field Office on their Cyber Squad and two years at FBI Cyber Division Headquarters in Washington D.C. She has significant experience working cyber-related matters including computer intrusion investigations, intellectual property (IP) rights violations, theft of trade secrets, economic espionage and other investigations.



Melissa Rivenbark serves as the Banking Operations Manager for the Department of State Treasurer and is a recent graduate of the NC School of Banking. Her 21-year banking career began as a Teller while she attended NC State University where she earned her bachelor's degree in Business Management. She continued her career in banking which included leadership roles in Branch Management.

Melissa resides in Wake Forest with her husband and two children ages 14 and 12. She enjoys time with her family, volunteering at her church, and supporting her daughter who plays volleyball and son who plays baseball.



Holly A. Sullenger, M Ed, ABD PhD describes herself as a knowledge broker. She currently works as the Assistant Director for NC State University's Technology Training Solutions, a unit within the Division of Continuing and Professional Education. Her unit delivers both technology and professional development courses to members of business and industry who need additional knowledge to get ahead in their fields.

Holly is also a sought-after speaker for many organizations and professional associations, having done both technical and professional training for over 25 years. During that time, she also managed five different training centers, provided business software solutions to corporations across the country, and still runs her own consulting business. Holly specializes in the Microsoft products, and is known for her Excel Tips and Tricks seminar, which is sold-out each time it runs.

Holly believes strongly in the benefits of participating in lifelong education. She is currently in the dissertation phase of PhD studies in Adult Education at NC State University. Her previously earned degrees in Adult Education, Business Administration, Computer Science, and Liberal Arts, work together to provide Holly with a diverse knowledge base and an uncanny ability to connect with her audiences.



THE VALUE OF CROSS-TEAM COLLABORATION

Working Together for Success

ABSTRACT

Want to get a project done the right way? Cross-team collaboration is gaining popularity in business and industry, proving that having many areas of expertise and talent on a team really does guarantee a better solution.

Holly A. Sullenger, PhD

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In most organizations, _____ of the knowledge in the company is stored in the heads of its employees.

Of the _____ of knowledge that actually makes it into electronic form _____ of that is locked away on individual hard drives, which are only accessible to a single person.

In other words, _____ of the information your team needs to collaborate is accessible to a single person.

What is a cross-functional team?

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Four advantages of a cross-functional team are:



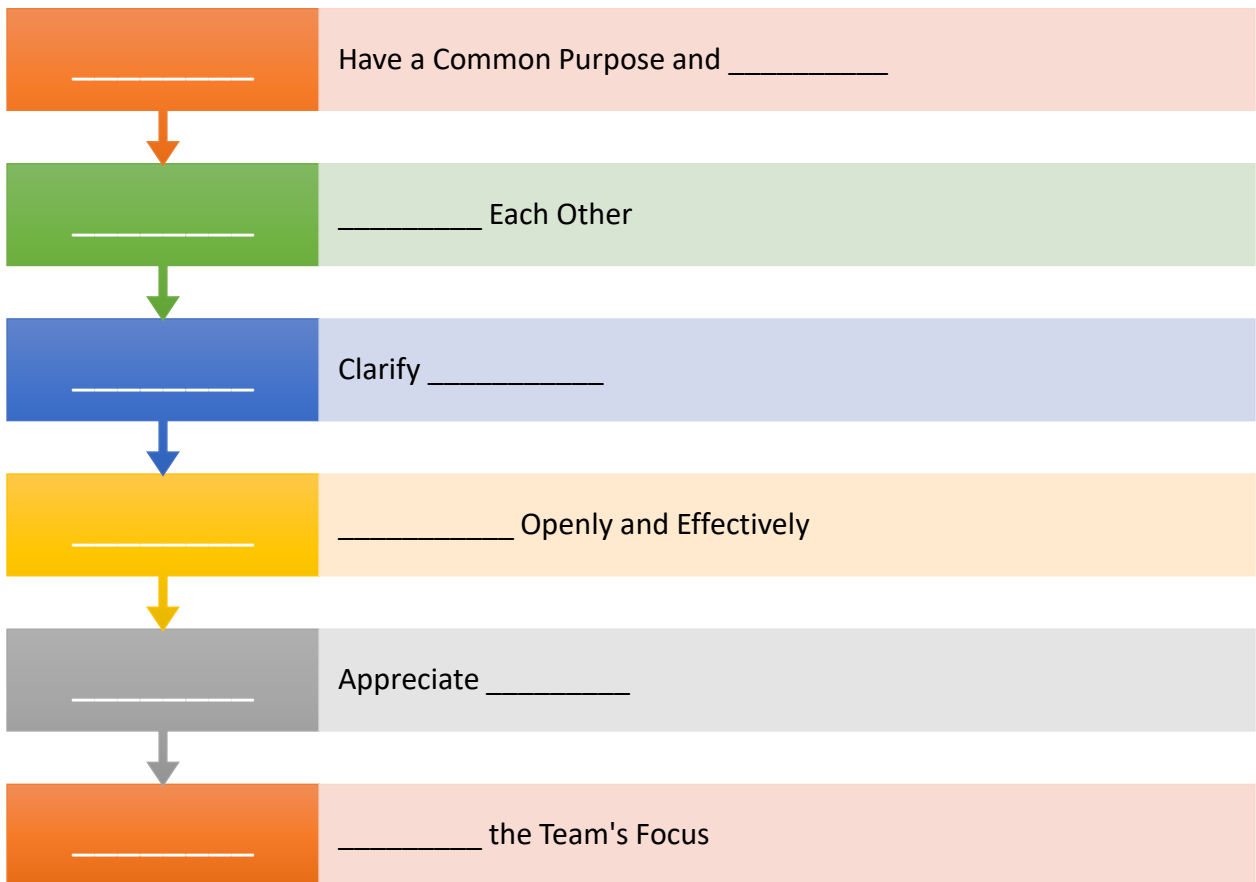
Five steps to collaboration and teamwork are:

What are the responsibilities of the cross-collaboration team leader?



The six job descriptions for a cross-collaboration leader are:

Six qualities to assess when assembling a team include:



The members of a cross-collaborative team might include:

The four stages of cross-team formation include:



Four challenges to overcome:

The seven deadly sins that can keep a team from success include:





As Banking Director for the North Carolina Department of State Treasurer, Brandon oversees the State's depository accounts, disbursing operations and banking services. He began his financial career at Merrill Lynch and transitioned to banking with the former Central Carolina Bank. It was there that he developed a passion for banking and the impact it can have on people's lives. He rose through the ranks into management at SunTrust Bank, which acquired Central Carolina Bank. Prior to joining the Department, he also worked for First Citizens Bank where he focused primarily on small business development, working with clients who were intent on growing their business or implementing efficiency solutions. Brandon graduated from Duke University with a degree in economics. He is also an alumnus of Leadership North Carolina where he gained an in-depth perspective of issues impacting North Carolinians daily. A resident of Durham, Brandon enjoys photography and spending time with his wife and two kids.



2019 OSC E-COMMERCE CONFERENCE

APRIL 17, 2019 | 8:15 AM - 4:15 PM
MCKIMMON CENTER - NCSU - RALEIGH, NC

Questions from 2019 eCommerce Conference

- Is the use of things like Apple Pay and Samsung Pay at a retail location significantly more secure than using a card?
 - In most cases, there is no credit card data presented but just a token. It isn't in scope for PCI since there isn't a Visa, Mastercard, Amex, etc., in use. The payment card data is stored at Apple, Samsung, etc.
- Why does it take so long to discover that a company has been hacked?
 - Because the bad guys want to collect new cards for as long as possible so they don't make themselves known. Once the company knows they have been hacked, there may be internal, external, or FBI investigations to find out what was done and try to catch the bad guys before they let the world know that they were breached. The banks and card brands must be notified in a timely basis since they are the ones financially at risk.
- Does 12.8 and 12.9 speak to liability for fines?
 - 12.8 is all about vendor management. The merchant is liable for everything unless they have identified that a third party is responsible for the requirement. If the vendor has taken responsibility, (12.9) and that is the cause of the breach and/or fines, the vendor is liable.
- When is URL redirect not in PCI scope?
 - When it is being hosted and managed by a PCI compliant third-party vendor. It is still in scope but covered under the AOC (Attestation of Compliance) for that vendor.
- I have a question from the conference that came up regarding our environment. We have a café located on our campus that is contracted by a third party. They have their own internet connection from which they process credit cards. However, this entity contracts space on our campus using our physical ethernet lines to submit the credit card transactions (even though it's not through our internet connection). Since they serve our students from our campus, are we violating any PCI compliance rules by allowing them to work in this manner? Thank you for any insight!
 - If the school isn't providing any services, they wouldn't be considered a service provider to the merchant. It would be a best practice to ask for their AOC every year to ensure they are PCI compliant. It would also be prudent to review the contract for that space to see what the contract says the school is providing and for which it is responsible.
- From the first presentation, P2PE, Security & Mobile Payments, does that mean the FD130 machines with TransArmor are not P2PE?
 - The FD130 is E2E with TransArmor and is not P2PE. Still secure, just not eligible for the P2PE SAQ. Adding TransArmor also reduces PCI scope.
- I do have a couple of questions regarding the CVV codes for credit card transactions. We are trying to find out whether or not PayPal and SunTrust will charge additional fees for using the CVV feature. We've pulled all the paperwork, and it is not completely clear.
 - There is no fee for cvv.

**2019 eCommerce Conference
April 17, 2019**

Attendees by Last Name (226)

Reuben Affiah-NC Central University
Patrice Alexander-Revenue
Robert Alford-OSC
Barbara Anderson-DNCR
Lewis Andrews-State Treasurer
Beth Arrington-Education Assistance Authority
Lamees Asad-UNC Chapel Hill
Chasity Ashby-Revenue
Jennifer Baird-Agriculture
Rita Baker-State Treasurer
Lorrie Barbee-DOT
Leslie Barber-NC Housing and Finance
Latrice Barner-DEQ
DeAhn Baucom-UNC Chapel Hill
Brandon Bell-Revenue
Jennifer Bell-NCSU
Jeannie Betts-DHHS
Linda Blackmon-OSC
Wanita Bledsoe-Secretary of the State
Cedric Booth-Fayetteville State University
Sandra Boozer-NC A&T
Katie Bosken-NC Commissioner of Banks
Michael Bowers-DIT
Dee Bowling-ECU
Debra Bradsher-City of Raleigh
Robert Brinson-DPS
Kevin Brodie-NC Housing and Finance
Barry Brown-OSC
Taylor Brumbeloe-OSC
Wendi Brusseau-Wake County Government
Amanda Bullard-Cumberland County
Anita Bunch-Revenue
Michelle Burks-DHHS
Edith Cannady-OSC
Tonya Carr-Wilson Technical CC
Tim Carroll-NC Housing and Finance
Wynona Cash-OSC
Craig Caudill-DEQ

Susan Charlton-DPS
Steve Chase-Wildlife
Stephen Cochrane-UNC School of the Arts
Elizabeth Colcord-OSC
Jim Coleman-Western Piedmont CC
Lorie Coley-DOT
Jennifer Coltrane-NCSU
Sean Cooper-Town of Holly Springs
Adrienne Covington-Nash Community College
Jason Cowan-DOT
Margaret Craig-NC State Ports Authority
Amanda Crumpler-Rockingham County
Ann Cutler-State Treasurer
Terry Dail-NC State Ports Authority
Audrea Dale-DIT
Cathy Daniels-NC Community Colleges
Linda Daquil-City of Fayetteville
Angela Davis-UNC-Chapel Hill
Steve Davis-DPS
Jason Dearman-DOI
John DeGrego-DPS
Irene Deng-UNC-Chapel Hill
Jerusha Diamond-Revenue
Garrett Dimond-General Assembly
Debbie Dryer-UNC General Administration
Angela DuBose-NC A&T
Tara Eason-Elizabeth City State University
Bivian Ejimakor-NC A&T
Jolene Elkins-DHHS
Leah Englebright-NC SSM
Michael Euliss-OSC
Laresia Everett-DOI
Bonaventure Ezewuzie-DPI
Vincent Falvo-ECU
Joanne Ferguson-UNC Wilmington
Kelli Fisk-DHHS
David Fitzgerald-City of Raleigh
Jerry "Cliff" Flood-UNC System Office
Samiel Fuller-DPI
Keisha Gaither-NC SSM
Anne Godwin-OSC
Kristy Gordon-NC A&T

Robin Gore-UNC Asheville
Laura Greenwood-DOI
Wendy Griffin-DOT
Sean Gutowski-OSC
Rachael Haines-Elizabeth City State University
Jennifer Hamm-Catawba Valley CC
Keith Hammonds-State Treasurer
Luke Harris-DOT
Rebekah Hartberger-UNC Charlotte
Daniel Haulsey-Elizabeth City State University
Elizabeth Haynes-USS NC Battleship Commission
Jeffrey Henderson-Fayetteville State University
DJ Hess-City of Raleigh
Sonya Hicks-Wake County Government
Alonzo Hines-NC A&T
Shannon Hobby-Commerce
Simuel Hodges-NC Housing and Finance
Sandy Hoilman-Western Piedmont CC
Todd Honeycutt-DOT
Sheila Hopkins-Wake County Government
Ron Horn-Guilford Technical CC
Jim Horne-General Assembly
Brandon Howell-Town of Chapel Hill
Gloria Howell-DHHS
Melissa Huffman-City of Wilmington
Larry Huffman-DHHS
Scott Hummel-NC A&T
Heather Hummer-UNC System Office
Jessica Hwang-Strickland-UNC Chapel Hill
Timothy James-ASU
Jonathan James-OSC
Shivani Jani-OSC
Bud Jennings-AOC
Elizabeth John-AOC
Sheela John-NC Commissioner of Banks
Brittany Johnson-Revenue
Shawn Johnson-UNC Chapel Hill
Brad Johnson-OSC
Donna Jones-DHHS
Sandra Jones-Fayetteville State University
Sue Kearney-Agriculture
Keyta Kemp-NCSU

Brett Kenney-UNC Chapel Hill
Laura Klem-OSC
Oscar Knight-ASU
Heidi Kozlowski-NCSU
Ariana Kudlats-NC Housing and Finance
Frank Kusluski-NC Commissioner of Banks
Darlene Langston-DPS
Todd Leck-Wildlife
Judy LeDoux-UNC Chapel Hill
Tracey Lemming-UNC Chapel Hill
Alexis Levenson-UNC Asheville
Douglas Lewis-Revenue
Donna Lindsay-DOL
Christopher Long-Revenue
Frank Lord-WSSU
Felecia Lucas-DHHS
Elisha Lunceford-UNC System Office
Arun Malik-UNC Chapel Hill
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Robin Mayo-ECU
Jeannette McGlinsky-OSC
Jackie McKoy-Revenue
Ben McLawhorn-OSC
John Meese-NC Housing and Finance
Joel Mercer-DHHS
Jolene Meyer-State Education Assistance Authority
Courtney Michelle-OSC
Jolanta Milczanowski-Town of Holly Springs
Karen Miller-UNC Pembroke
Gloria Moore-Rockingham CC
Todd Morgan-DOT
Clayton Murphy-NCSU
Debra Neal-DHHS
Jonathan Newton-Town of Dallas
Hans Norland-DPS
Nancy Norris-Western Piedmont CC
Patty Norris-DEQ
Tony Norwood-DOA
Kim Orr-UNC Chapel Hill
Kim Padfield-DOT
Tracy Patty-NCSU
Gary Penrod-UNC School of the Arts

Meera Phaltankar-DPI
Jan Prevo-OSC
David Price-Greene County
Derek Pryor-Revenue
Chandrika Rao-UNC Chapel Hill
Heather Reaves-ASU
David Reavis-OSC - SC
Cindy Revels-UNC Pembroke
Jessica Rhem-Town of Cary
Steven Rhew-UNC Greensboro
Amanda Richardson-DNCR
Phillip Robinson-Revenue
Ellen Rockefeller-OSC
Scott Rogers-Caldwell CC & Technical Institute
Wayne Rogers-DOT
Barbara Roper-DPI
Elizabeth Rozakis-State Education Assistance Authority
Janet Rupert-UNC Chapel Hill
Stephanie Ryals-NC Commissioner of Banks
Lei Satterfield-Revenue
Joanie Saucier-OSC
Troy Scoggins-OSC
Melissa Simmons-SC State Treasurer's Office
Bridgette Singletary-Bladen Community College
Thomas Smith-City of Charlotte
Becky Smith-UNC Charlotte
Betty Smith-Fayetteville Technical CC
Dana Smith-DIT
Jonathan Smith-WSSU
Laurie Smith-DOT
Randy Smith-OSC
Stephen Snively-NC Commissioner of Banks
Ashley Sodre-UNC Greensboro
Kaschia Spells-Wilson Technical CC
Cathy Spence Daniels-NC Community College System
Marc Stanard-DEQ
Faye Steele-ECU
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Keith Strand-Western Piedmont CC
Carol Strickland-Fayetteville State University
Susan Suits-UNC Wilmington

Shirley Swanson-Catawba Valley CC
Marla Tart-Wake Technical CC
Wesley Taylor-General Assembly
Karen Thiessen-Wake County Government
Kathleen Tolbert-OSC
Jim Tulenko-OSC
Kim Van Metre-NC Community College System
Prabhavathi Vijayaraghavan-OAH
Helen Vozzo-NCSU
Megan Wallace-UNC General Administration
Brett Warner-NC Housing and Finance
Myron Watterson-SC State Treasurer's Office
Susan Weekley-Wilson Technical CC
Rex Whaley-DEQ
Sherron White-Elizabeth City State University
T. Renee Williams-Elizabeth City State University
Ashlee Williams-OSC
Joseph Wilson-DOT
Nona Young-Revenue
Ling Zhu-DOA

**2019 eCommerce Conference
April 17, 2019**

Attendees by Agency (226)

Jennifer Baird-Agriculture
Sue Kearney-Agriculture
Bud Jennings-AOC
Elizabeth John-AOC
Timothy James-ASU
Oscar Knight-ASU
Heather Reaves-ASU
Bridgette Singletary-Bladen Community College
Scott Rogers-Caldwell CC & Technical Institute
Jennifer Hamm-Catawba Valley CC
Shirley Swanson-Catawba Valley CC
Thomas Smith-City of Charlotte
Linda Daquil-City of Fayetteville
Debra Bradsher-City of Raleigh
David Fitzgerald-City of Raleigh
DJ Hess-City of Raleigh
Melissa Huffman-City of Wilmington
Shannon Hobby-Commerce
Amanda Bullard-Cumberland County
Latrice Barner-DEQ
Craig Caudill-DEQ
Patty Norris-DEQ
Marc Stanard-DEQ
Rex Whaley-DEQ
Jeannie Betts-DHHS
Michelle Burks-DHHS
Jolene Elkins-DHHS
Kelli Fisk-DHHS
Gloria Howell-DHHS
Larry Huffman-DHHS
Donna Jones-DHHS
Felecia Lucas-DHHS
Joel Mercer-DHHS
Debra Neal-DHHS
Danny Stewart-DHHS
Michael Bowers-DIT
Audrea Dale-DIT
Dana Smith-DIT

Barbara Anderson-DNCR
Amanda Richardson-DNCR
Steven Stewart-DNCR
Tony Norwood-DOA
Ling Zhu-DOA
Jason Dearman-DOI
Laresia Everett-DOI
Laura Greenwood-DOI
Donna Lindsay-DOL
Lorrie Barbee-DOT
Lorie Coley-DOT
Jason Cowan-DOT
Wendy Griffin-DOT
Luke Harris-DOT
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Todd Morgan-DOT
Kim Padfield-DOT
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Laurie Smith-DOT
Joseph Wilson-DOT
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Samuel Fuller-DPI
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Barbara Roper-DPI
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Susan Charlton-DPS
Steve Davis-DPS
John DeIGreco-DPS
Darlene Langston-DPS
Hans Norland-DPS
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Vincent Falvo-ECU
Robin Mayo-ECU
Faye Steele-ECU
Beth Arrington-Education Assistance Authority
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Rachael Haines-Elizabeth City State University
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