

## NFC PAYMENTS AND THE POINT OF SALE

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Driven by the EMV liability shift and growing cross-industry collaboration, broad merchant adoption of NFC terminals for payments and mobile wallet applications will spur new innovation at the point of sale.





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## EXECUTIVE SUMMARY

Many payments innovations have received a cold shoulder from U.S. merchants over the years -- including smart cards, biometrics and many mobile payment innovations. But the coming liability shift means that merchants must upgrade their payments infrastructure to EMV terminals or risk absorbing the costs of card present counterfeit card fraud. Most, if not all, of those new terminals will support NFC – Near Field Communications -- a short-range communications technology that is now widely integrated in smartphones and could potentially revolutionize shopping at the point of sale.

When Apple announced the iPhone 6 and iPhone 6 Plus in September 2014, it was the last of the top smartphone manufacturers to offer NFC devices. Many industry observers and participants believe that the shift to new EMV-enabled payment terminals combined with Apple's adoption of NFC payments will be the driving force behind the next wave of payment innovation.

NFC makes it feasible for smartphone users to embrace mobile electronic wallet applications that can encompass credit/debit card accounts, loyalty programs, electronic couponing, egifting and other value-added applications.

Consumers will be able to access a wallet app, tap their phone on a POS device and quickly and efficiently complete a transaction. This paves the way for new payment opportunities and opens the door for new innovation and companies in a market that has been shackled by the limitations of mag-stripe payment cards.

Often lost in the NFC discussion and speculation, is the role of that ubiquitous device that is needed to make it all possible – the payment terminal sitting on a merchant's counter or in the lane. This primer examines NFC technology as it applies to payments, and the role that POS terminals and the merchant are likely to play in the development of this new frontier in electronic payments.

## NFC – BEYOND CONTACTLESS PAYMENT

NFC uses the same radio transmission frequency (13.56 MHz) as contactless smartcards. But the smartcards are relatively passive objects that respond only when in the presence of a contactless-equipped reader. NFC, on the other hand, is a more interactive, multi-use technology that makes it possible to integrate contactless payment with intelligence embodied in a smartphone or other device.

NFC comes in two forms: one is a passive tag that operates very much like a traditional smartcard, responding to the signal from a contactless reader. The other form is as a reader and writer; 2-way communication that provides the ability to actively accept NFC transmissions such as information from an NFC-tagged poster, app or kiosk.

While NFC has a wide range of potential applications, it is the use as reader/writer in a mobile phone that generates the most anticipation and excitement. In 2013, according to the U.S. Federal Reserve, 87 percent of U.S. adults had a mobile phone, 61 percent of those devices were Internet-enabled smartphones and 51 percent of smartphone owners had used mobile banking in the previous 12 months<sup>1</sup>. That data indicates a large and until now relatively untapped audience for mobile payment and the additional services that NFC can enable.

Part of the scramble among companies comes from Apple's reputation for upending other industries. The iPod, for instance, revolutionized how consumers buy digital music. The iPhone has changed the way people use their cellphones in their daily life. Companies large and small think Apple's payments service could potentially have the same effect.

-- The New York Times, Sept. 30, 2014

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<sup>1</sup> "Consumers and Mobile Financial Services 2014," March 2014. Board of Governors of the Federal Reserve System.



NFC chips embedded in mobile phones allows the phone to operate as either a card or a reader. So, while an NFC-enabled phone can simply emulate an existing contactless card, it can also read tags embedded in other devices and engage in two-way communications with another NFC chip-enabled device. Because it can operate in a passive mode, the NFC-equipped phone is able to conserve battery power; but the user can easily access applications to turn the phone into NFC active mode.

According to the NFC Forum, an industry group formed to develop the specifications and ensure interoperability of NFC, the technology “has the power to bring new simplicity and convenience to many aspects of a typical person's daily life” including such functions as:

- Interaction with an automobile, such as adjusting seat position, or -- as is already available in some markets - - paying a parking meter
- Getting information at a bus station or airport kiosk, and -- as implemented with Soft Card in Utah -- paying for a fare
- Logging into computers and copier machines
- Downloading and personalizing applications

“Because mobile devices will use contactless technology in the form of an embedded computer chip, the mobile phone will be a much more secure payment device than the plastic cards we use today,” Cindy Merritt.

Furthermore, NFC offers security mechanisms that plastic cards lack. “Because mobile devices will use contactless technology in the form of an embedded computer chip, the mobile phone will be a much more secure payment device than the plastic cards we use today,” wrote Cindy Merritt, assistant director of the Retail Payments Risk Forum, an organization housed at the Federal Bank of Atlanta<sup>2</sup>. She said that current card payments technologies “are becoming increasingly obsolete and vulnerable to fraud.”

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<sup>2</sup> Cindy Merritt, “Dispelling the myths about mobile banking and payments,” April 11, 2011. [Portals and Rails blog](#), Federal Reserve Bank of Atlanta.

## HOW NFC WORKS AT THE POINT OF SALE

NFC-capable POS devices and PIN pads will let the merchant connect more closely with customers and profit from this re-imagined way of life.

NFC-enabled smart phones are poised to change everything about the point of sale transaction experience. From mobile payment and electronic ticketing to in-store couponing and loyalty programs—NFC technology is ready to transform how we live, work and play.

On the countertop or at some other point of service, NFC-capable POS devices and PIN pads will let the merchant connect more closely with customers and profit from this re-imagined way of life.

First, the consumer has to payment-enable an NFC-equipped phone. Here's how that process works:

- Consumer purchases an NFC-enabled smart phone and sets up his or her card subscriptions
- A card is enabled on the consumer's smart phone in one of the following ways:
  - ✓ Card payment credentials are cryptographically stored in a SIM or Secure Element within the phone, which requires involvement of the consumer's mobile operator or phone manufacturer via a Trusted Services Manager (TSM)
  - ✓ An issuer payment app or phone manufacturer app is enabled in the device operating system utilizing a technology called Host Card Emulation, which does not require involvement of the mobile operator
- Consumer taps their NFC phone on an NFC-capable acceptance device to make payment via NFC
- The transaction is routed through the acquirer to the card issuer for authorization and processing, and to service providers who may be providing couponing or loyalty rewards and discounts



NFC is not just another technology for payment. It is a two-way, real-time communication between the merchant and the consumer that can enhance the payment process. With NFC, merchants and retailers of all kinds can turn their point-of-sale into a much more valuable “point of interaction” that provide customers with intelligent checkout capabilities. Some of the NFC-enabled functions at the point-of-sale include:

- Increasing sales by making it easier for consumers to use virtual gift cards (e-gifts), participate in loyalty programs and earn rewards at the POS
- Two way communication (peer-to-peer) between the handset and POS device to transmit coupons, loyalty rewards, payment and promotional messages
- Providing links and unsurpassed payment convenience for social media fan favorites and group discount offers
- Gathering customer data efficiently through NFC-enabled devices for improved consumer analytics
- Enabling alternative payments such as person-to-person

With NFC, new media technology is converging with new payment solutions. This shift is much more than just payment converging with media-it's really a whole new category that's all about engaging the customer at the merchant location and seamlessly bridging the online and offline worlds. This "new" media is at the point of sale with every electronic transaction consumers make-it's the convergence of offline and online marketing and promotions.

In addition to payment capabilities, NFC leverages “presence” – which connects location-based social media online services and capabilities to the store, the lane, and the checkout; location can be determined via Wi-Fi and Bluetooth Low Energy signals, and by utilizing GPS. Tapping the NFC phone at an NFC-equipped payment terminal or other device can be used by centralized services to locate the presence of the consumer and determine their likely intention. It is this capability that will enable online discount providers to integrate electronic coupons, promotions, discounts and loyalty rewards with the consumer’s physical checkout transaction, so there’s no need to fumble for printed coupons.

## NFC AND SECURITY

Payment security is a raging topic in the retail industry due to persistent and highly publicized cyber-attacks aimed at compromising large retailer networks as well as more targeted, physical efforts to “skim” card data.

NFC payments enable additional security layers to be applied that can curtail the easy counterfeiting of traditional mag-stripe plastic card data. In the case of a payment system utilizing a SIM or Secure Element, a digital token that replaces the Primary Account Number with a surrogate value is transmitted to the consumer’s phone and securely stored, as is the case with Apple Pay. HCE can also utilize tokenization, but in a different manner: for each transaction a different token is generated and sent to the consumer’s device to authenticate the payment.

Consumers or issuers can also require additional security measures, such as the use of a PIN or SMS message, that require the consumer to enter additional information to authenticate the transaction as legitimate. In the case of Apple Pay, the consumer authenticates the transaction utilizing the iPhone’s Touch ID biometric sensor for a “one touch” experience.

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The card brands are providing incentives to encourage retail adoption of EMV terminals that “must be enabled to support both EMV contact and contactless chip acceptance, including mobile contactless payments based on NFC technology.”<sup>3</sup> As a result, NFC-ready dual-interface payment terminals are most likely to become the de facto standard for merchant payment devices.

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<sup>3</sup>Visa Bulletin, “Visa Expands Technology Innovation Program for U.S. Merchants to Adopt Dual Interface Terminals,” August 9, 2011. Visa, Inc.



## WHY NFC IS MORE LIKELY TO SUCCEED

Contactless smartcards—also known as proximity cards—were envisioned as the next generation beyond magnetic stripe or chip-based smartcards. Cardholders would possess a new credit or debit card with embedded electronic circuits that could store data and, when in contact or close proximity to a contactless reader, would process data to initiate a payment transaction.

NFC encompasses contactless payment technology, but it does much more than enable electronic transactions.

Early implementations of contactless payment began well over a decade ago. A key advantage of implementing contactless solutions is that the technology can be readily adapted to current payment systems.

One of the earliest and most ambitious implementations of contactless payment was the Speedpass fob system rolled out by Mobil (now ExxonMobil) beginning in 1997. In following years, there were a few notable system wide implementations such as that of McDonald's in 2004; and Transport for London's Oyster card proved contactless technology is highly effective for fare collection in mass transit environments.

MasterCard with PayPass and Visa with PayWave each tried to spur on card issuer and merchant adoption of contactless payments. American Express and Discover offered their own contactless technology and banks such as Citibank and JP Morgan Chase in the U.S. and Barclays in the U.K. began issuing cards to consumers.

But consumers and retailers barely responded to the pitch that contactless would provide greater speed and convenience at the checkout counter and, for the most part, highly publicized pilots seemed to either wither on the vine or just never evolve to a full-scale implementation stage.



Some proponents of contactless payment believe that the reason the technology failed to match expectations was that the promise of speedier checkout was not a sufficient incentive for either merchant or consumer. Except in transit where speed is required and a closed system non-NFC contactless card is the norm, the difference between a contactless and a swipe payment are marginal to the average consumer and not sufficient to convince a merchant to upgrade his or her acceptance devices.

When NFC is deployed as a two-way communication between a consumer device and payment terminal, however, the speed and convenience factor of contactless is enhanced with substantial incentives for both merchant and consumer. For the merchant, there's the prospect of combining 'brick & mortar' checkout with online promotions and electronic coupons. For the consumer, there is the allure of electronic wallets stored conveniently on a mobile phone, and the opportunity to take easily cash in rewards, gift cards and discounts electronically as part of the payment process and to leverage social media-oriented applications.



## WHAT HAS TO CHANGE

In May 2013, the Federal Reserve Banks of Boston and Atlanta released a report<sup>4</sup>, declaring, “while the mobile landscape remains characterized by fragmentation, various developments have gained importance. These include the convergence of channels, the role of nonbanks, the formation of new relationships, the unresolved security and privacy issues, and the increasing role of data monetization. As this ecosystem matures it will challenge new entrants in their ability to achieve scale and sustainability, while technology will continue to proliferate and drive improved efficiencies and innovation. The need for interoperability, industry guidance, and standards will become even more critical to ensure a secure and cost-efficient ecosystem.”

Until the introduction of Apple Pay, cross-industry collaboration had been fragmentary and slow-developing:

- In 2011, the introduction of Google Wallet for NFC-equipped Android phones was widely anticipated as the dawn of a new era of contactless, smartphone payments when major retailers signaled their support; but with banks and networks viewing Google as a competitor “rather than a helpful intermediary,<sup>5</sup>” the effort failed to catch fire.
- Three major U.S. wireless networks allied themselves around the Isis Wallet (since renamed Soft Card) and have since signed up issuers American Express, Chase and Wells Fargo; but this wallet was slow in moving from pilot phase to general availability.
- In 2012, a group of large retailers, including WalMart and Target, formed the Merchant Customer Xchange, or MCX, in an effort to forge their own mobile payments network in which they would have greater control over transaction fees. In 2014, MCX unveiled its CurrentC mobile application, which instead of using NFC generates a barcode on the screen of a mobile device.

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<sup>4</sup>Marianne Crowe, et al, “U.S. Mobile Payments Landscape – Two Years Later,” May 2, 2013. Federal Reserve Banks of Boston and Atlanta.

<sup>5</sup> David Auerbach, “Why Apple Pay Can Succeed Where Google Wallet Failed,” Sept. 12, 2014. *Slate*.



It is obviously no easy task getting card brands, retailers, issuing banks, wireless operators and handset manufacturers all to agree on mobile payments. The announcement of Apple Pay in September 2014, however, set a new standard for cross-industry collaboration: those participating include Visa, MasterCard and American Express; banks including, Bank of America, Capital One, Chase, Citi, and Wells Fargo; and major retailers such as Bloomingdales, Macys, McDonald's, Subway and Walgreens. Apple Pay is compatible with the existing base of installed contactless readers in the U.S., estimated at about 200,000. (Note: Today, every NFC-capable VeriFone terminal has the capability to support Apple Pay.)

There still are millions of payment devices out in the field that need to be upgraded before NFC-payment becomes ubiquitous, but with the EMV liability shift looming, many merchants and service providers have already begun the process of updating to EMV and NFC capable payment devices to qualify for the incentives.



## VERIFONE'S ROLE IN ENABLING THE NFC POINT OF SALE

Enabling NFC payments and non-payment applications requires acceptance devices for a wide variety of environments and a vision of how to ensure merchants—from the largest to the smallest—can easily migrate to this new era with the confidence that investments today will be viable as new capabilities and payment services come on-stream.

VeriFone is the recognized leader in payments with millions of systems deployed globally and the software and infrastructure required to leverage NFC payment capabilities into a new intelligent checkout that supports retail payments and web-based services at the point of sale. With VeriFone devices on a majority of merchant countertops and in checkout lanes of multilane retailers, the company is at the epicenter of the NFC ecosystem and is investing heavily to provide the infrastructure required to make NFC a reality at the point of sale.

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VeriFone is the one-stop solution with the services and expertise to guide you into this new landscape of the POS experience. By bringing together end-to-end, PCI-compliant payment security with media content delivered digitally at the POS, VeriFone enables merchants and acquirers to engage consumers while generating new streams of revenue from digital content, eye-catching coupons and loyalty offers. For more information visit <http://www.verifone.com/solutions-services/mobile/mobile-wallets-nfc/>.

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