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Bluetooth. Radio-frequency identification. QR codes. The modern world is constantly expanding, and with it new technologies are emerging that change the way we communicate and interact with each other. NearFieldCommunication.org is dedicated to training individuals, small businesses and large companies alike to essentially close the field of communication and how it can work for you. Who benefits from near-field communication? Busy moms check into the grocery store. Businessmen and Women riding the subway to work. Businesses is looking for faster, safer payment methods for customers of students touring the museum and more. Near Field Communication (NFC) technology allows smartphones and other devices with enabled ways to communicate with other devices containing the NFC tag. Whether swiping your smartphone at the grocery store, waving it over a display at a local museum, or bumping phones with a friend to share the latest games, near-field technology allows you to pay, play and learn easily. Explore our website to learn more about how individuals and entities benefit from NFC. We will show you the ups, downs and connections of this growing technology and answer all your questions about security, usage and technology that have made this growing form of data transmission possible. From the humble roots of radio frequency identification to a growing market around the world, learn about this rapidly expanding technology that can replace the need to carry multiple credit and debit cards at once. For more information on official standards and rules related to near-field communication, check out the NFC forum. This nonprofit association sets standards to ensure the safety and compatibility of devices capable of working with NFC. Google is committed to promoting racial equality for black communities. Let's see how to do it. Near Field Communication (NFC) is a set of short-range wireless technologies that typically require a distance of 4 cm or less to initiate a connection. NFC allows you to share small payloads between the NFC tag and your Android device or between two Android devices. Tags can vary in complexity. Simple tags suggest simply reading and writing semantics, sometimes with one-off programmable areas, to make a map just for reading. More complex tags offer mathematical operations and have cryptographic equipment to authenticate access to the sector. The most complex tags contain operating environments, making it difficult to interact with the code on the tag. The data stored in the tag can also be written in a variety of formats, but many Android Platform APIs are based on an NFC FORUM standard called NDEF (NFC data exchange format). Powered devices with NFC, three main modes of operation are supported simultaneously: Reader/writer mode, which allows the NFC device to read and/or write passive tags and NFC stickers. P2P mode that allows NFC NFC Share data with other nfc colleagues. This mode of operation is used by Android Beam. The card emulation mode that allows the NFC device itself to act as an NFC card. The NFC emulation card can then be accessed by an external NFC reader, such as the NFC point of sale terminal. NFC Basics This document describes how Android handles detected NFC tags and how it notifies applications of data that are relevant to the app. It also goes on how to work with NDEF data in your applications and gives an overview of the APIs that support the basic set of NFC Android features. Advanced NFC This document runs through APIs that allow you to use a variety of tag technologies that Android supports. When you're not working with NDEF data, or when you're working with NDEF data that Android can't fully understand, you have to manually read or write on a tag in raw bytes using your own protocol stack. In these cases, Android provides support for detecting certain tagging technologies and to connect with the tag using your own protocol stack. Map-based Host Emulation This document describes how Android devices can perform like NFC cards without using a secure element that allows any Android app to emulate the map and speak directly to the NFC reader. Content and code samples on this page are subject to the licensing described in the Content License. Java is a registered trademark of Oracle and/or its affiliates. Last updated 2019-12-27 UTC. Radio communication is installed between the devices, bringing them in close proximity. Computer Network types by spatial area: Nanoscale Spatial Field (NFC) Body Area Network (BAN) Personal Area Network (PAN) Near-me (NAN) Local Area Network (LAN) Home Area Network (HAN) Storage Area Network (SAN) Wireless Local Area Network (WLAN) Campus Area Network (CAN) Spine Area Network (SPAN) Metropolitan Area Network (MAN) Municipal Wireless (MWN) Broadband Area Network (WAN) Cloud Area Network (CAN) Internet Interplanetary Network vte Nearest Communication Field (NFC) is a set of communication protocols for communication between two electronic devices at a distance of 4 cm (1/2 inches) or less. NFC offers a low connection with a simple setup that can be used to download more capable wireless connections. NFC devices can act as electronic identity documents and key cards. They are used in contactless payment systems and allow you to replace or supplement mobile payment systems such as credit cards and electronic smart card tickets. Sometimes it's called NFC/CTLS or CTLS NFC, with contactless abbreviated CTLS. NFC can be used to share small files, such as contacts, and download fast connections to share large media such as photos, videos, and other files. Chip Secure an NFC chip containing data such as the Secure Element ID (SEID) for secure transactions. This chip is commonly found in smartphones and other NFC devices. A review of similar ideas in advertising and industrial application has generally not been successful commercially, in terms of technology such as QR codes, barcodes and UHF RFID tags. NFC protocols set a generally accepted standard. When one of the connected devices has an Internet connection, the other can share data with online services. The Near Communication Field (NFC) describes a technology that can be used for contactless communication over short distances. Two nfc-capable devices are connected through point contact at a distance of 0 to 2 cm. This connection can be used to exchange data (e.g. processing and maintenance and maintenance data) between devices. This interface can also be used to parameterize the component. NFC-enabled portable devices can be provided with app software, such as reading electronic tags or paying for when you connect to an NFC-compatible device. Previously, close-range technology was used, which was patented by the manufacturer for applications such as stock tickets, access control and reader payment. Like other proximity map technologies, NFC is based on an inductive connection between two so-called antennas. NFC-enabled devices, such as a smartphone and printer, interacting in one or both directions using a 13.56 MHz frequency in the globally available unlicensed ISM radio frequency range using the ISO/IEC 18000-3 air interface standard at a data rate of 106 to

424 kbps. Each active NFC device can operate in one or more of three modes: NFC card emulation allows NFC-enabled devices, such as smartphones, to act like smart cards, allowing users to perform transactions such as paying or selling tickets. NFC reader/writer allows NFC-enabled devices to read information stored on low-cost NFC tags embedded in labels or smart posters. NFC peer-to-peer allows two NFC-enabled devices to communicate with each other to share information in a special manner. NFC tags are passive data stores that can be read and, in some circumstances, recorded on an NFC device. As a rule, they contain data (according to 2015 data from 96 to 8,192 bytes) and are read only as usual, but can be overworked. Apps include secure storage of personal data (e.g. debit or credit card data, loyalty program data, personal IDENTIFICATION numbers (PIN codes), contacts). NFC tags can be specifically coded by their manufacturers or use industry specifications. The standards were provided by the NFC Forum. The Forum was responsible for promoting technology and setting standards and certifying the compliance of devices. Secure communications are available through encryption algorithms, as is done for credit and if they meet the criteria for being considered a personal network area. NFC standards cover communication protocols and data-sharing formats and are based on existing radio frequency identification (RFID) standards, including ISO/IEC 14443 14443 Felica. Standards include ISO/IEC 18092 and standards set by the NFC Forum. In addition to the NFC Forum, the GSMA Team has identified a platform for deploying GSMA NFC standards on mobile phones. GSMA's efforts include a reliable service manager, a single-wire protocol, testing/certification, and a secure element. The NFC patent licensing program is in the process of being rolled out by France's Brevec, a patent fund established in 2011. This program was under development by Via Licensing Corporation, an independent subsidiary of Dolby Laboratories, and was discontinued in May 2012. The platform-free open source NFC library, libnfc, is available under the GNU Lesser General Public License. Current and expected applications include contactless transactions, data sharing, and simplified settings for more complex communications, such as Wi-Fi. The history of NFC is rooted in radio frequency identification technology (known as RFID), which allows compatible hardware to both supply electricity and communicate with a ailing and passive electronic tag using radio waves. This is used for identification, authentication and tracking. May 17, 1983 - The first patent associated with the acronym RFID is granted to Charles Walton. 1997 - Early form is patented and first used in Hasbro Star Wars characters toys. The patent was originally conducted by Andrew White and Mark Borrett at Innovision Research and Technology (patent WO9723060). The device allowed data to be transmitted between two units in close proximity. March 25, 2002 - Philips and Sony agree to create a technical specification and create a technical plan. Philips Semiconductors has applied for six fundamental NFC patents invented by Austrian and French engineers Franz Amtman and Philippe Mogar, who won the European Inventors Award in 2015. December 8, 2003 - NFC was approved as an ISO/IEC standard and then as an ECMA standard. 2004 - Nokia, Philips and Sony established the NFC Forum in 2004 - Nokia will launch NFC shell add-ons for the Nokia 5140, followed by the Nokia 3220 models, which will be shipped in 2005. 2005 - Experiments of mobile phones in transport, with payment in May in Hanau (Nokia), as well as check on board in October in Nice with orange and payment in stores in October in Kana (Samsung) with the first reception of information Fly Tag 24 '25' 2006 - Initial specifications for NFC tags (NFC Tags) 2006. - The SmartPoster (27) 2007 recording specification is the NFC innovation tag used in the first consumer test in the UK, the Nokia 6131 phone. 2008 - AirTag launches the so-called first NFC SDK. In January 2009, nfc Forum issued Peer-to-Peer standards for contact transfer, Bluetooth, etc. 2009 - NFC was first used in China Unicom and Yucheng Transportation Card transport in tram tracks bus Chongqing January 19, 2009, and then implemented for the first time in the subway network, China Unicom in Beijing on December 31, 2010. 2010 - Innovision releases a set of samples and patents for low-cost, mass-market mobile phones and other devices. 2010 - The first smartphone with NFC support Nokia C7 is released. The NFC feature was enabled by a software update in early 2011. 2010 - Samsung Nexus S: First Android NFC phone shown May 21, 2010 - Nice, France launches, with Cityzi, a good city contactless mobile project, the first in Europe to provide residents with NFC bank cards and mobile phones (such as the Samsung Player One S5230), and a bunch of services covering transportation (trams and buses), tourism and student services 383940 2011 - Google I/O As NFC demonstrates NFC to initiate the game and share the URL, video or video. 2011 - NFC support becomes part of Symbian's mobile operating system with the release of Symbian Anna. 2011 - Research in Motion devices are the first to be certified by MasterCard Worldwide for their PayPass service in 2012, the UK restaurant chain EAT. and Everything Everywhere (Orange Mobile Network Operator), partner of the UK's first nationwide NFC-enabled smartposter campaign. A specially created mobile phone app is triggered when an NFC-enabled mobile phone comes into contact with a smartposter. 2012 - Sony unveils THE NFC Smart Tags to change modes and profiles on Sony's smartphone at close range, including the Sony Xperia P smartphone released in the same year. 2013 - Samsung and VISA announce a partnership to develop mobile payments. 2013 - IBM scientists, trying to curb fraud and security breaches, are developing NFC-based mobile authentication technology. This technology works on similar principles with two-factor authentication security. 2014 - ATT, Verizon and T-Mobile release Softcard (formerly ISIS mobile wallet). It works on NFC-enabled Android phones and iPhone 4 and iPhone 5 when the NFC external case is attached. The technology was acquired by Google, and the service ended on March 31, 2015. November 2015 - Swatch and Visa Inc. announce a partnership to allow NFC financial transactions using Swatch Bellamy's wristwatch. The system currently operates in Asia in partnership with China UnionPay and Bank of Communications. The partnership will bring technology to the United States, Brazil and Switzerland. November 2015 - Google's Android Pay feature, a direct competitor to Apple Pay, is launched and its deployment is launched throughout the United States. NFC design is a set of short-range wireless technologies that typically require a split of 10 cm or less. NFC runs at 13.56 MHz on iso/IEC 18000-3 air interface and at speeds from 106 kbps to 424 NFC always includes the initiator and and the initiator actively generates an RF field that can lead to a passive target. This allows NFC targets to take very simple form factors such as infirm tags, stickers, key fobs, or cards. Nfc peer-to-peer communication is possible, provided both devices are powered, NFC tags contain data and are usually only readable, but can be squirming. They can be specifically coded by their manufacturers or use NFC Forum specifications. Tags can securely store personal data, such as debit and credit card data, loyalty program data, PINs, and network contacts, among other information. The NFC Forum identifies four types of tags that provide different speeds and communication capabilities in terms of customization, memory, security, data storage, and endurance recording. Tags currently offer 96 to 8,192 memory bytes. As with the proximity map technology, NFC uses an inductive connection between two nearby cycle antennas effectively forming an air transformer. Since the distances associated with this are tiny compared to the wavelength of electromagnetic radiation (radio waves) of this frequency (about 22 meters), the interaction is described as a close field. Only the alternating magnetic field is involved so that almost no force is actually emitted in the form of radio waves (which are electromagnetic waves, also involving a oscillating electric field); which essentially prevents interference between such devices and any radio communication at the same frequency or with other NFC devices far beyond its intended range. They operate within the globally accessible and unlicensed ISM 13.56 MHz radio frequency band. Most of the RF energy is concentrated in the bandwidth ±7 kHz allocated for this band, but the spectral width of radiation can be up to 1.8 MHz wide to support high data speeds. The distance of working with compact standard antennas and realistic power levels can be up to 20 cm (but practically speaking, working distances never exceed 10 cm). Please note that because the pickup antenna can be quenched by nearby metal surfaces, the tags may require minimal separation from such surfaces. The ISO/IEC 18092 standard supports data speed 106, 212 or 424 kbps. In this mode, the target device can draw its operational force from the magnetic field provided by the initiator. Active both initiators and target devices communicate, alternately generating their own fields, stops transmitting data from another. This mode requires both devices to include power supplies. Speed (kbps) Active Device Passive Device 424 Man, 10% ASK Man, 10% ASK 212 Man, 10% ASK Man, Man, Man, ASK 106 Modified Miller, 100% ASK Man, 10% ASK NFC uses two different codings to transmit data. If an active device transmits data from 106 kbps, modified Miller coding is used with 100% modulation. In all other cases, Manchester coding is used with a modulation ratio of 10%. Vulnerabilities While the NFC range is limited to a few centimetres, simple NFC does not provide a secure connection. In 2006, Ernst Gasselsteiner and Klemens Breitfusch described possible attacks and described in detail how to use NFC resistance to man in the middle attacks to establish a specific key. Because this method is not part of the ISO standard, NFC does not provide any eavesdropping protection and may be vulnerable to data modifications. Apps can use high-level cryptographic protocols (such as SSL) to create a secure channel. The RF signal for wireless data transmission can be picked up by antennas. The distance from which an attacker can eavesdrop on a Russian signal depends on several parameters, but usually less than 10 meters. In addition, eavesdropping is highly dependent on the mode of communication. A passive device that does not generate its own RF field is much harder to eavesdrop on than an active device. An attacker can usually eavesdrop within 10m of an active device and 1m for passive devices. Because NFC devices typically include ISO/IEC 14443 protocols, relay attacks are feasible. For this attack, the enemy sends the reader's request to the victim and passes his response to the reader in real time, posing as the owner of the victim's smart card. It's like a man in the middle attack. One example of libnfc code shows the relay of an attack using two commercial NFC devices. This attack can only be implemented with two NFC-enabled mobile phones. NFC Protocol standards stack review OF NFC standards cover communication protocols and data sharing formats, and are based on existing RFID standards, including ISO/IEC 14443 and FeliCa. Standards include ISO/IEC 18092 and standards set by the NFC Forum. ISO/IEC NFC is standardized in ECMA-340 and ISO/IEC 18092. These standards define modulation, coding, transmission speed, and RF frame format for NFC devices, as well as the initialization schemes and conditions required to manage data when initialized for both passive and active NFC modes. They also define transport protocol, including protocol activation and data-sharing techniques. The nfc interface is standardized in: ISO/IEC 18092 / ECMA-340-Near Field Communication Interface and Protocol-1 (NFCIP-1) / ECMA-352-Near Field Communication Interface and Protocol-2 (NFCIP-2) A and Type B, and FeliCa. NFC-enabled phones work basic level with existing readers. In card emulation mode, the NFC device must give the reader at least a unique identification number. In addition, nfc Forum has identified a generic data format called the NFC Data Exchange Format (NDEF), which can store and transport products ranging from any MIME-type object to ultra-short RTD documents such as URLs. The NFC Forum has added a simple NDEF (SNEP) exchange protocol to the specification that allows you to send and receive messages between two NFC devices. The GSMA GSM Association (GSMA) is a trade association representing about 800 mobile phone operators and more than 200 companies operating on products and services in 219 countries. Many of its members have overseen NFC tests and are preparing services for a commercial launch. GSM is involved in several initiatives: Standards: GSMA develops certification and testing standards to ensure global compatibility of NFC services. Pay-Buy-Mobile initiative: seeks to define a common global approach to the use of NFC technology to connect mobile devices with payment and contactless systems. On November 17, 2010, after two years of deliberations, ATT, Verizon and T-Mobile launched a joint venture to develop a platform through which NFC payments could be made in cell phones. Originally known as Isis Mobile Wallet and later as Softcard, the venture was designed to usher in a wide-ranging rollout of NFC technology that allows its NFC-enabled cell phone customers to function similarly to credit cards across the US. Following an agreement with Google and the purchase of an IP address, Softcard's payment system was shut down in March 2015 with the approval of its previous competitor, Google Wallet. StoPaN StoPaN (Store Logistics and Payment with NFC) is a pan-European consortium supported by the European Community's Information Society Technology Program. StoPaN will explore the potential of local NFC wireless communications. The NFC Forum NFC Forum is a non-profit industry association founded on March 18, 2004 by NXP Semiconductors, Sony and Nokia to promote the use of NFC wireless interaction in consumer electronics, mobile devices and PCs. Standards include four different types of tags that provide different speeds and communication capabilities covering flexibility, memory, security, data storage and endurance. NFC Forum promotes the introduction and standardization of NFC technology to ensure compatibility between devices and services. As of January 2020, there were more than 120 member companies at the NFC Forum. Nfc Forum promotes NFC and certifies compliance with devices and whether it fits into a personal network. Other GSMA standardization bodies have identified a platform for deployment GSMA NFC in mobile phones. GSMA's efforts include a single wire protocol, testing and certification, and a secure element. GSMA GSMA the deployment of NFC (NFC Forum) protocols on mobile phones is neither exclusive nor generally accepted. For example, the rollout of Google Emulation Host Cards on Android KitKat provides software control of universal radio. In this HCE Deployment 69 NFC protocol is used without GSMA standards. Other standardization bodies involved in NFC include: ETSI/SCP (Smart Card Platform) to specify the interface between the SIM card and the NFC chipset. EMVCo for impact on emV payment applications N-Mark Logo applications for NFC-devices NFC allows one- and two-way communication between endpoints, suitable for many applications. NFC trading devices can be used in contactless payment systems similar to those used in credit cards and smart card electronic ticketing and allow mobile payments to replace/complement these systems. In Android 4.4, Google introduced support for the NFC-based secure transaction platform through Host Card Emulation (HCE), payments, loyalty programs, card access, transit passes, and other user services. HCE allows any Android 4.4 app to emulate an NFC smart card, allowing users to initiate transactions with their device. Apps can use the new reading mode as readers for HCE cards and other NFC-based transactions. On September 9, 2014, Apple announced its support for NFC-based transactions within Apple Pay. With the advent of iOS 11, Apple devices allow third-party developers to read data from NFC tags. Downloading other NFC connections offers a low-speed connection with a simple setup that can be used to download more capable wireless connections. For example, Android Beam software uses NFC to pair and connect Bluetooth when transferring files, and then disable Bluetooth on both devices when it's finished. Nokia, Samsung, BlackBerry and Sony have used NFC technology to pair Bluetooth headsets, media players and speakers at the touch of a button. The same principle can be applied to Wi-Fi network configuration. Samsung Galaxy devices have a feature called S-Beam - an extension of Android Beam that uses NFC (to exchange MAC addresses and IP addresses) and then uses Wi-Fi Direct to share files and documents. The advantage of using Wi-Fi Direct over Bluetooth is that it allows you to transfer data much faster, up to 300 Mbps. NFC-enabled IDENTIFICATION and tokens can act as electronic identity documents and cards Short-range NFC support and encryption make it more appropriate than less private RFID systems. Automation of smartphones and NFC tags NFC equipped smartphones can be paired with NFC tags or stickers that may be NFC applications. These programs can allow you to change your phone settings, text messages, start an app, or execute a command. Such applications do not rely on the company or manufacturer, but can be used immediately with an NFC-equipped smartphone and NFC tag. In 2015, the NFC Forum published a signature entry type (RTD) 2.0 to add integrity and authenticity to NFC tags. This specification allows the NFC device to check tag data and identify the tag's author. Gaming See also: The list of NFC gaming platforms has been used in video games, starting with Skylanders: Spyro's Adventure. These are customizable figurines that contain personal details with each piece, so that no two shapes are similar to each other. The Nintendo Wii U was the first system that incorporates NFC technology out of the box through GamePad. It was later included in the Nintendo 3DS line (built into the new Nintendo 3DS/XL and a separately sold reader who uses Infrared to communicate with old 3DS family consoles). The amiibo accessory range uses NFC technology to unlock features. Sport Adidas Telstar 18 is a soccer ball that contains an NFC chip inside. The chip allows users to interact with the ball using a smartphone. Bluetooth Comparison Aspect NFC Bluetooth Low Energy Tag Requires Power No Yes Yes Cost Tag US\$0.10 US\$5.00 RFID Compatible ISO 18000-3 Active Body Standard ISO/ IEC Bluetooth SIG Network Standard ISO 13157 etc was I Eee 802.15.1; Now on SIG Grid specifications type Point-Point WPAN Cryptography Not with RFID Affordable Range of zlt; 2m ±100 m (class 1) ≈50 m Frequency 13.56 MHz 2.4-2.5 GHz Bit speed 424 kbps 2.1 MHz 1 Mbps Time of setting 0.1 s 6 s lt; 0.006 with Current Consumption of 15 mA (read) Options with a class of 15 mA (read and transmit) NFC and Bluetooth are relatively short-term communication technologies available on mobile phones. NFC runs at lower speeds than Bluetooth, and has a much shorter range, but consumes much less energy and does not require pairing. NFC is configurable faster than standard Bluetooth, but has a lower transmission speed than low-energy Bluetooth. With NFC, instead of manual configurations to identify devices, the connection between the two NFC devices is automatically established in less than 0.1 seconds. The maximum NFC data speed (424 kbps) is slower than Bluetooth V2.1 (2.1 Mbps). The MAXIMUM NFC operating distance of less than 20 cm reduces the likelihood of unwanted interception, making it particularly suitable for crowded places, making it more difficult to correlate the signal with its transmitting physical device (and therefore its user). NFC is compatible with existing RFID passive infrastructures (13.56 ISO/IEC 18000-3). This requires relatively low power, similar to the Bluetooth V4.0 low-energy protocol. When NFC works with a weak device (e.g. phone that can be turned off, contactless smart credit card, smart poster), however, the energy consumption of NFC is greater than that of Bluetooth V4.0 Low Energy, as the lighting of the passive tag needs extra power. Main feature of devices: A list of NFC-enabled mobile devices In 2011, phone vendors released more than 40 NFC-enabled phones with Android mobile operating system. BlackBerry devices support NFC using the BlackBerry tag on devices run by The BlackBerry OS 7.0 and great. MasterCard has added additional NFC support for PayPass platforms for Android and BlackBerry platforms, allowing PayPass users to make payments using their Android or BlackBerry smartphones. The partnership between Samsung and Visa has added the payWave app to the Galaxy S4 smartphone. In 2012, Microsoft added its native NFC functionality to its Windows Phone 8 mobile OS as well as the Windows 8 operating system. Microsoft provides the Wallet Center in Windows Phone 8 to pay for NFC and can integrate multiple NFC payment services into one app. In 2014, the iPhone 6 was released by Apple to support NFC. And from September 2019, Apple's iOS 13 now lets you read out NFC tags and tag them using the NFC app. Some firms have moved to a full-scale deployment of services covering one or more countries. Multinational deployments include the introduction of NFC technology by Orange for banks, retailers, transport service providers and services in many European countries, as well as Airtel Africa and Oberthur Technologies, deployed in 15 African countries. In November 2013, China Telecom (China's third-largest mobile operator) launched the NFC deployment. The company has registered several banks to make its payment applications available on their SIM cards. China telecom said the wallet will support coupons, membership cards, fuel cards and boarding passes. By 2014, the company planned to meet targets for the introduction of 40 models of NFC and 30 Mn NFC SIM. Softcard (formerly Isis Mobile Wallet), a joint venture between Verizon Wireless, ATT and T-Mobile, focuses on in-store payments using NFC technology. After piloting in some regions, they started all over the U.S. Vodafone has launched Vodafone SmartPass mobile payments service in Spain in partnership with Visa. This allows consumers to make contactless payments through SmartPass credit balances in any POS using an NFC-enabled mobile device. OTI, an Israeli company that develops and develops contactless smart card technology based on microprocessors, has signed a contract to supply NFC readers to one of its channel partners in the United States. The partner had to buy \$ OTI NFC readers worth 3 years. Rogers Communications has launched a virtual virtual Suretap to allow users to make payments with their phone in Canada in April 2014. Suretap users can download gift cards and prepaid MasterCard from national retailers. Sri Lanka's first working smart card uses NFC. As of December 13, 2013, Tim Hortons TimmyME BlackBerry 10 Application allowed users to link Tim's prepaid card to the app by allowing payment by clicking on an NFC-enabled device with a standard contactless terminal. Google Wallet allows consumers to store credit card data and store loyalty card information in a virtual wallet, and then use an NFC-enabled device at terminals that also accept MasterCard PayPass transactions. In Germany, Austria, Finland, New Zealand, Italy, Iran, Turkey and Greece, NFC ticketing systems for public transport were tried. On July 1, 2013, the Lithuanian capital Vilnius completely replaced paper tickets for public transport with ISO/IEC 14443 Type A. Payments based on the NFC sticker in the Australian Bankmecu and card issuer Cuscal completed a trial version of the NFC payment sticker, which allowed consumers to make contactless payments in Visa payWave terminals using a smart sticker attached to their phone. India operates NFC-based operations at the box office for ticket sales purposes. The Partnership between Google and Equity Bank in Kenya has introduced NFC payment systems for public transport in the capital Nairobi under the bebaPay brand. January 2019 began the process of using NFC-enabled Android mobile phones to pay for public transport in Victoria, Australia. Cm. Also BebaPay CIPURSE Device to the device equalizer Mobile phone accessories Nearby and far field New Nintendo 3DS Object hyperlink Poken RuBee Smart keychain TecTiles TransferJet Wii U GamePad Notes - Cameron Faulkner. What is NFC? Everything you need to know. Techradar.com. received on November 30, 2015. b c d NFC as a technology enabler. NFC Forum. Archive from the original on December 22, 2013. Received June 15, 2011.CS1 maint: BOT: original-url status unknown (link) - b Pelly, Nick; Jeff Hamilton (May 10, 2011). Like NFC. Google I/O 2011. Received on April 16, 2014. The house is an NFC forum. NFC Forum. 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