Social Networking

الشبكات الاجتماعية

ITMC 413

إعداد

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WHAT IS NFC?

Near-field communication (NFC)

- Is a set of communication protocols that enables communication between two electronic devices over a distance of 4 cm or less.
- NFC devices can act a selectronic identity documents and keycards ,they are used in contactless payment systems and allow mobile payment replacing or supplementing system such as credit cards electronic ticket smart cards.
- NFC-enabled portable devices can be provided with application software for example to read electronic tags or make payments when connected to an NFC-compliant system.
- NFC standards cover communications protocols and data exchange formats and are based on existing radio-frequency identification (RFID) standards

NFC devices can act as either a reader or tag:

What is an NFC tag?

- Is a small integrated circuit consisting of a copper coil some amount of storage Data can be read or written to this tag only when another NFC device is brought near it because it doesn't have a power source . The proximity of the NFC device induced power in the tag and enables data transmission ,the tags can securely store personal data such as debit and credit card information .

What is an NFC reader ?

- Any powered device that has its own NFC coil (like smartphone or tablet) can act as a NFC reader , the reader device uses its battery to generate an electromagnetic field ,which powers any tag brought near it.

Every active NFC device can work in one or more of three modes:

- **NFC card emulation:**

Enables NFC-enabled devices such as smartphones to act like smart cards, allowing users to perform transactions such as payment or ticketing.

- **NFC reader/writer:**

Enables NFC-enabled devices to read information stored on inexpensive NFC tags embedded in labels or smart posters.

- **NFC peer-to-peer:**

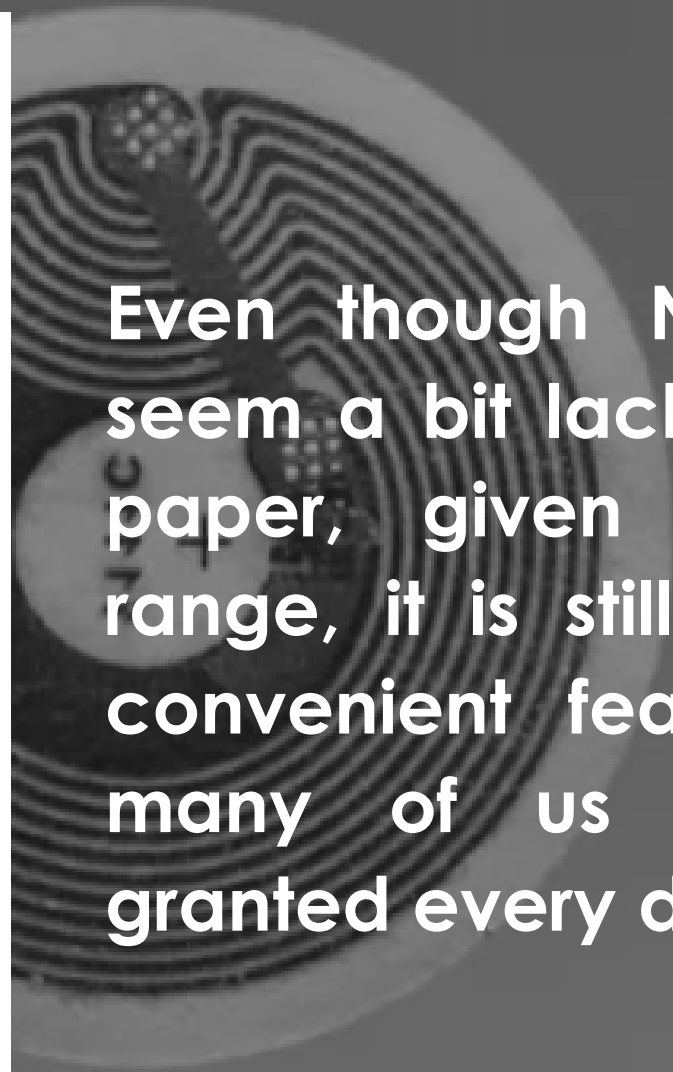
Enables two NFC-enabled devices to communicate with each other to exchange information in an ad hoc fashion.

Where NFC is used?

Near-Field Communication technology is commonly used in Mobile devices, but you can also find it in Tablets, Speakers, Collectibles, and even gaming consoles like the Nintendo Switch and 3DS.

How NFC is Made?

it's an evolution of RFID (radio frequency identification) technology that has already been around for decades. If you've ever used a key card to access an office building or hotel room, you're already familiar with how it works.



Even though NFC may seem a bit lackluster on paper, given its short range, it is still a pretty convenient feature that many of us take for granted every day.

NFC and its similarities with other technologies

Example1

Both RFID and NFC operate on the principle of inductive coupling, at least for short-range implementations. This essentially involves the reader device generating a magnetic field by passing an electric current. When a tag is brought nearby, the field induces an electric current within the tag sans any wires or even physical contact. Then, once the initial handshake is complete, any stored data on the tag is wirelessly transmitted to the reader.

NFC is based on RFID technology, but has a much lower transmission range.
The key distinction between RFID and NFC lies in their transmission ranges the former is often used over longer distances.

NFC, however, only has a maximum range of a few centimeters, at most. And in most smartphone-related applications, you'll find that the software will only initiate communication if there's physical contact. This is to prevent accidental triggers especially important now that the technology is used for transferring sensitive data.

Another noteworthy point is that NFC devices can act as either a reader or tag. This bidirectional capability allows you to use one piece of hardware such as your smartphone for all kinds of different applications

NFC and its similarities with other technologies

Example2

One of NFC's biggest strengths is that it does not require pairing or manual input to establish a connection — tapping takes less than a second. Bluetooth devices, by contrast, have to be paired to each other, which is kind of a cumbersome process.

NFC is also significantly more energy-efficient than Bluetooth and UWB since the transmission range is extremely short.

While cars are starting to adopt UWB tech for keyless entry, it's nowhere near as efficient as NFC. To that end, it's not surprising that many automakers implement the latter as a fallback access mechanism. UWB is also more expensive and most applications currently served by NFC don't need its positional precision.

NFC Various Applications

DATA TRANSFER	MOBILE PAYMENT	QUICK PAIRING
PUBLIC TRANSPORT ACCESS	GAMING	HOME AUTOMATION

NFC VS Bluetooth:

Bluetooth is a wireless technology that enables data exchange between fixed and mobile devices over short distances.

Bluetooth	NFC
Bluetooth offers an operating range of up to 10m	NFC tends to operate on a shorter distance – less than 4 cm
Bluetooth is more likely to have interference in transmission due to its longer range	NFC's shorter distance enables a stronger connection with no interference
Bluetooth requires a manual setup to pair the devices	NFC connection is quite easy to establish with no authentication needed
Bluetooth need more powe	NFC consumes less power
Bluetooth less secure than nfc	NFC tends to be more secure

Thank You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