

NFC - Near Field Communication

Introduction

NFC stands for Near Field Communication. As the name suggests, it involves exchange of data at close proximity by using radiowaves. They are used in contactless payments, transport cards, and even transferring of data between NFC devices like phones.

It is based on technology used in Radio-Frequency identification (RFID), something used in item tagging in retail stores. This consists of an RFID tag, an RFID reader, and an antenna. The antenna will allow the tag to transmit the data to the reader. The reader then converts these radio waves into a more usable form of data

How it works

NFC works off of small chips enabling data transfer between devices, of which there are active and passive ones. Active NFC devices are powered by an external source, and are able to both send and receive data. Passive devices can only send data, but do not require a power source of any kind. This is because when the passive and active devices are in close proximity, the active component's electromagnetic field induces small currents in the passive device, allowing data to be sent by the passive device.

For example when you tap your card on the bus, the bus' active card reader is enabling your card to passively send information to the reader. When information is exchanged between devices, each device switches between active and passive states.

The three main uses/modes of NFC

- NFC devices exchanging information by switching between passive and active states
- active NFC device reads information from a passive device
- active nfc device used for contactless payment

Some Stats

- Theoretical max distance is 20cm, but works more effectively at 10cm
- Max speed is 424kbit/s
- Transmission frequency is 13.56MHz (13.56 million wavelengths every second)

Advantages

Since only the active device needs a power supply, NFC is much more power efficient than other communication methods. Additionally, as passive devices are only able to send information when very near an active one, there is no need to worry about any of the information being sent without your knowledge.

Another advantage is how convenient and quick it is to use. Many other communication methods require pairing (bluetooth) or connecting (wifi). For NFC, data is transferred the moment the devices are within range, making it the best method for quick small transfers.

Disadvantages

As one would imagine, one of the main flaw of NFC is its extremely small range. While they effectively work at 10cm, many people end up physically tapping the devices. However for a lot of its current main uses, there is no need (and it is better) for NFC to have a larger effective range.

Another issue is the transfer speed. Compared to most other communication methods, NFC's maximum speed of 424kbit/s