SNS COLLEGE OF ENGINEERING

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Accredited by NAAC-UGC with 'A' Grade
Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

Department of AI & DS

Course Name – Internet of Things & AI
III Year / V Semester

CONNECTIVITY TECHNOLOGIES AND COMMUNICATION PROTOCOLS

NFC PROTOCOL

- Near Field Communication (NFC) is a set of short-range wireless technologies, typically requiring a distance of 4cm or less to initiate a connection.

- It enables short range communication between compatible devices. At least one transmitting device and another receiving device is needed to transmit the signal.

- NFC allows you to share small payloads of data between an NFC tag and an Android-powered device, or between two Android-powered devices

- It is a contactless mode of communication using electromagnetic waves.

TYPES OF NFC DEVICL

- NFC devices can be classified into 2 types:

- Passive NFC devices

- Active NFC devices

Passive NFC devices :

These include tags, and other small transmitters which can send information to other NFC devices without the need for a power source of their own.

These devices don't really process any information sent from other sources, and can not connect to other passive components.

These often take the form of interactive signs on walls or advertisements.

Active NFC devices:

- These devices are able to both the things i.e. send and receive data.

- They can communicate with each other as well as with passive devices.

- Smartphones

- Card readers in public transport and touch payment terminals are also good examples of the technology.

How NFC works

- NFC network consists of two devices known as initiator device and target device.

- NFC tag can be active as well as passive device. NFC reader is always active device.

NFC Reader Reading Card
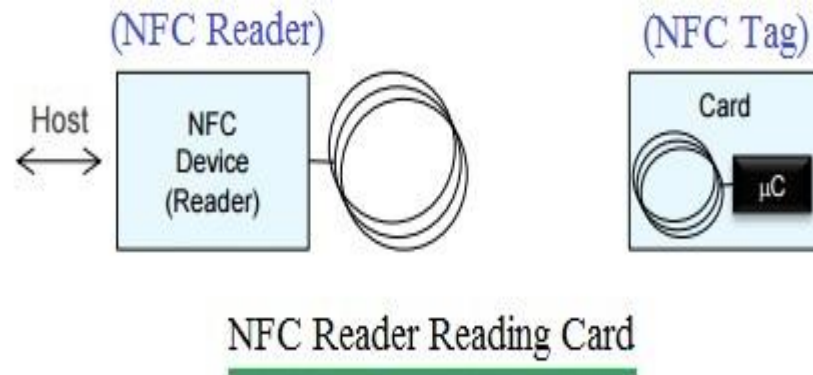
- These devices operate either in

- active-active

- active-passive modes

- active-active mode-both the NFC devices will have their own power

- active-passive mode-passive device derive its power from received EM waves of the active device.

- Basic mode of communication is half duplex in NFC

- one NFC device transmits while other device receives.This is also referred as "Listen before Talk".

- one of the two NFC devices will function as initiator which first listen on channel and transmits only when no other signal is there on channel

- The transmission frequency is 13.56 megahertz for data across NFC. Data can be sent at either 106, 212, or 424 kilobits per second which is quick enough for a range of data transfers like contact details to swapping pictures and music .

- The NFC standard currently has three distinct modes of operation to determine what sort of information will be exchanged between devices.

Three types of modes

peer-to-peer mode-The most common used in smartphones is the peer-to-peer mode. Exchange of various piece of information is allowed between 2 devices. In this mode both devices switch between active when sending data and passive when receiving.

read/write mode-It is a one-way data transmission. The active device, possibly your smartphone, links up with another device in order to read information from it. NFC advertisement tags use this mode.

card emulation-The third mode of operation is card emulation. The NFC device can function as a smart or contactless credit card and make payments or tap into public transport systems.

Examples of NFC

- mobile payments, such as Apple Pay and Google Pay;

- transit card payments;

- access authentication for doors or offices;

- unlocking car doors

- device pairing smartphones

- automatic setup for Wi-Fi connectivity by tapping a phone to a router or internet gateway;

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