

# What can you do with Android and NFC?

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## What is Android?

- an open source, Linux-based mobile OS
- allows you to make use of some neat hardware, including an NFC chip
- apps are written in Java, and really easy to put onto a mobile device for testing

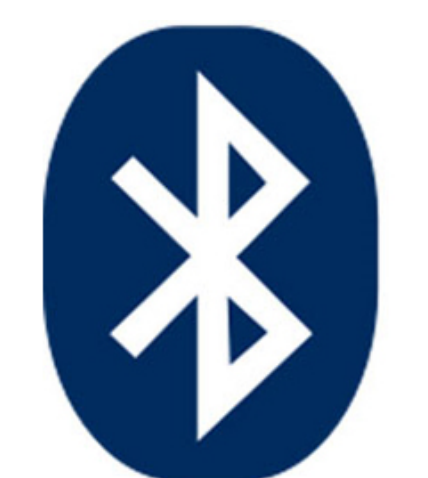


## What is NFC?

- stands for “near field communication” (near = about 4cm)
- uses magnetic induction to create a radio-wave field that the target can detect and access, allowing small amounts of data to be transferred wirelessly over a relatively short distance
- evolved from RFID
  - compatible with existing RFID terminals
  - unlike RFID, NFC is a two-way street
- Android devices support 3 main modes of operation:
  - **read/write** – an active device reads/writes to a passive tag
  - **P2P** – two active devices swap data
  - **card emulation** – an active device emulates a passive tag, to be read by another active device



- *tags* vs. QR codes
  - easier to use, assuming your device has NFC (no reader required)
  - more expensive (tags are cheap, but not as cheap as QR codes)
  - about the same size
  - rewritable, if so desired



- *NFC* vs. Bluetooth
  - more secure, due to the limited range
  - requires less power
  - can't transmit as much data
  - transmits data more slowly

## What is NFC used for?

- Sharing
  - share text, links, contact info, etc. between devices
  - get information from a poster by tapping your phone to it
- Pairing
  - quickly set up Bluetooth or Wi-Fi connections
  - e.g. Android Beam (Google), S-Beam (Samsung)
- Transaction
  - pay for goods
  - pay transportation fares (e.g. CharlieCard)

## NFC Projects I've Worked On

- Summer 2012
  - Tag Organizer, an experimental Android app
    - allows the user to keep a collection of the NFC tags they've scanned, retransmit collected tags, and view the information they contain
  - HP Recipe Box, the Android companion to a Win8 app
    - allows the user to scan tags containing shopping list data, incorporate it into their existing list, and view it all in a meaningful and interactive format
    - allows the user to scan, view, and retransmit tags containing recipes
- Summer 2013
  - Harmony, a music player for Android
    - allows the user to set up a Bluetooth connection between their mobile device and a set of NFC-enabled speakers just by setting the device on the speakers
    - the user can then control the music from their mobile device
  - Tag Organizer for Fitbit, an Android + Win8 project
    - collect information about foods and activities from NFC tags and store them until they can be uploaded to the Fitbit website
  - Profile Switcher, a Win8 project
    - change the theme of your computer, open up a set of links, or start playing a certain playlist using NFC tags
  - Password Manager, an Android + Win8 project
    - login to accounts on your computer using your NFC-enabled mobile device

## The Future of NFC

- Coming to a device near you! (as long as you aren't surrounded by Apple products)
- Store your entire wallet on your phone!
  - coupons
  - credit cards
  - membership cards
  - bus passes
  - tickets
  - okay maybe not your driver's license...
- Automate everything\* with tags!
  - turn on your lights, your computer, the A/C, etc. with tags in your house
  - start up navigation apps with a tag in your car
  - activate Wi-Fi tethering with a tag on your laptop
  - share hideously long, but oh-so-secure Wi-Fi passwords with guests
- Sign in, login, check in, tap in with NFC!
  - your computer
  - your dorm building
  - your car
  - help room hours
  - events
- Succeed where QR codes failed!
  - Grab more data, faster

\*well, not everything