

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