# NFD-Android Enhancements

Alex Afanasyev Ju Pan Sanjeev Kaushik Ramani Davide Pesavento

### What was proposed

- Add ndnping server (#4765) and extend existing client implementation
- Allow changing strategy choices (#3462) and content store configuration at runtime
- Modify global NFD settings from the app: face protocols, multicast, logging, ... (#2623, #2746)
- Hub discovery improvements: Wi-Fi access point or IP gateway, DNS-SD, fix bugs, ... (#3840, #4028)
- Bug fixes and stability enhancements (#4688, #4628, #3409, ...)
- UI/UX improvements

#### What We Did

- Fixed several bugs in ndnping client implementation (#4688, #4628)
  - We rectified the unexpected start of ping when the app is launched and re-launched
  - Fixed crash when switching to another app while the ping client is running
- A more stable, better looking, and easier-to-use NFD app for Android
  - Added Material components to enhance the way the existing drawer looks
  - Added bottom navigation bar (with icons!)
- Basic KeyChain management (in progress)

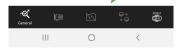
## UI/UX Enhancements

12:18 🔤	WUE 🕕 💌 🖌 O	12:28
← NFD		<del>~</del>
General		C N
	bautomatically	ঁর
	0.6.5	)@
	5 seconds and 822 milliseconds 12	M
	2 2	
	0 2	WE
	13 13 15	
	12	
	0	



12:29 🔤 Welte	0 🔊 🕄
≡ General	
GENERAL	
NFD is started	
Connect to the nearest hub automatically	
NFD STATUS	
Version Uptime 10 minutes, 56 seconds and 791 n	0.6.5 nilliseconds
NameTree entries	11
FIB entries PIT Entries	2
Measurement entries	2
CS entries	2
In interests	23
Out interests	23
In data Out data	25 21
In NACKs	0
Out NACKs	0

12:27 🔤 🖶 🖾	영식 홍내에게 44%을
General	
GENERAL	
NFD is started	
Connect to the nearest hub automatically	
NFD STATUS	
Version Uptime NameTere entries PTI Entries PTI Entries In Messurement entries is in the entries in interests Out interests In data Out data In NACKs Out NACKs	0.6.5 523 milliseconds 16 16 20 3 3 8 8 8 8 10 7 7 0 0 0



#### Ping "Stabilized" and "Bug-Fixed"

12:28 🖾 🔤 👬 🔟 🖾	@₩ ३ऀॱ≅⊯ 44% 🛢
≡ Ping	
Prefix (e.g., /ndn/edu/arizona)	STOP
PING	
timeout from : seq=2343541819046999641	
timeout from : seg=2343541819046999642	
timeout from : seq=2343541819046999643	
timeout from : seq=2343541819046999643 timeout from : seq=2343541819046999644	



## Basic KeyChain Management

- Status quo
  - Java side
    - In-memory keychain
    - A random key and self-signed cert generated every time NFD app starts
    - Multiple in-memory keys keychains/keys for management and WiFi direct
  - JNI (NFD) side
    - Sqlite3 PIB/file-based TPM app-private location
    - Random key and self-signed cert generated first time NFD service starts
- Attempt to make things better
  - Shared app-private sqlite3/file PIB/TPM
  - Generate key once
  - Ability to export self-signed certificate(s) as a file (export from the common KeyChain)
  - Ability to import signed certificate as a file (and import to the common KeyChain)
  - Ability to import key bundle as a file

## Status of Basic KeyChain Management

- Shared app-private sqlite3/file PIB/TPM
  - Shared KeyChain: done
  - But running faced a few issues:
    - Default constructor with "pib-sqlite3" of jNDN-android picks a wrong PIB (Sqlite3PibImpl vs AndroidSqlite3PibImpl)
    - Can create directly Sqlite3PibImpl and FileTpmImpl, but they don't have PIB/TPM locators; Pib and Tpm have locators, but not part of KeyChain constructor
- Generate key once
  - Done (logic is in, but facing app crashes--could be related to PIB/TPM locators)
- Ability to export/import
  - Found how Android app can do this, but no implementation yet

#### Proposed vs. accomplished

- (-/+) Add ndnping server (#4765) and extend existing client implementation
- (-) Allow changing strategy/CS (#3462)
- (-) Modify global NFD settings from the app (#2623, #2746)
- (-) Hub discovery improvements: Wi-Fi access point or IP gateway, DNS-SD, fix bugs, ... (#3840, #4028)
- (+) Bug fixes and stability enhancements (#4688, #4628, #3409, ...)
- (+) UI/UX improvements
- (new, ~) Basic Keychain management
- (new, -) Failed initial attempt to refactor lifetime of NFD service in the app

Code in gerrit, ready for review and merge

Bug reports will be filed soon

## Demo

## What's left

• World domination