NDNProSe - NDN for Proximity Services

Jacopo De Benedetto (jacopo.de-benedetto@cs.uni-goettingen.de)

Motivation

Exploit NDN communication protocol for Proximity-based Services (ProSe).
ProSe is recent trend in device-to-device (D2D) communication that uses direct communication between mobile devices to:

- scan for location-based information in proximal environment;
- leverage the range of communication to establish the closeness to another device;
- eliminate the need for an user to share his exact location (gps) to receive location-based content

NDN communication protocol can help improve the effectiveness of ProSe communication by:

- enable ”on-request” advertisement using the interest-data communication mechanism;
- allow receiving transmissions from untrusted devices;
- reducing the trasmissions needed in multi-hop communication;
- allowing caching of the data on the intermediate nodes of the communication to be available also in case of failure of the original producer.

Contribution to NDN

The aim of the project is to develope a new NDN module to be an extension of the NDN code for ProSe. The module would be a base both for

- app-developers that want to create ProSe applications on top of the NDNProSe module and
- lib-developers for enabling different communication technologies to work with the NDNProSe module.

Tasks

The main tasks to be performed are:

- develop/modify the base NDN library to support BLE (or another wireless technology) advertisement;
- include the modified library in an android environment and develop sample apps for basic single-hop discovery;
- implement multi-hop discovery;
- (optional) optimize multi-hop discovery for specific use-case scenarios.

Required Knowledge for Participants

Althought every person with no specific skillset is welcome to join the project and bring his own ideas, the team has to cover at least those three areas of expertise:

- C/C++ programming for the NDN library;
- Java and Android programming for the app development;
- general software engineering and wireless networking background (BLE is preferred).

Expected Outcome

At the end of the hackaton we expect to show a demonstration of the effectiveness of the proximity discovery based on NDN using Android smartphones and recreating some use-case scenarios as:

- reciprocal discovery between proximal users/devices;
- discovery of simulated Point Of Interest;
- reception of cached proximal information.