Named Data Networking of Things and Example Application "Flow"

Zhehao Wang
404380075
zhehao@cs.ucla.edu

In this project we designed and implemented the application "Flow", a prototype home entertainment experience built using Named Data Networking (NDN). Flow provides an exploratory experience in which a player navigates and interacts with a virtual environment via person tracking, wearable devices, and mobile phones.
Through the design of this application we showed an approach to achieve two fundamental functions in IoT, trust management and rendezvous, in a way that does not rely on (but can incorporate) cloud-based services. At the heart of the design are application-defined hierarchically named and secured data packets exchanged at the networking level, from which trust management and rendezvous can be built.
To develop Flow, we designed and implemented the Named Data Networking of Things (NDN-IoT) framework, libraries in multiple languages that implement naming, trust and bootstrap, discovery, and application level publish/subscribe, to explore IoT-based application development in NDN.
This work was the main supporting application in our paper "Breaking out of the Cloud: Local Trust Management and Rendezvous in Named Data Networking of Things" (to appear in the *2nd ACM/IEEE International Conference on Internet-of-Things Design and Implementation*), whose sections IV and V described its design and implementation. The code and documentation are available online*, and the technical details of this work will be published as an NDN team technical report with the same title. We installed and demonstrated this application at Huawei Technologies, an industry partner of the NDN project, and also presented a poster at the 3rd NDN Community Meeting.

* Code repository: https://github.com/remap/ndn-flow, licensed under LGPLv3.