



IOT
IS
COMING

Named Data Networking of Things

Summary of this morning

- Goals: 1) Viable, consistently explained, public open source framework for NDNofT emerging in the next 6 months. 2) Public explanation @ NIST May 31.
- Concept
 - NDN lets you name the *Things* in the Internet of Things.
 - Greenfield opportunity to simplify the stack.
- Use Case
 - Smart home with shared neighborhood resources in normal and disconnected operation.
- Framework Ideas (first session)
- Supporting constrained devices (second session)
- Next: NIST Workshop on NDN, May 31-June 1 (conclusion)

Reference:

W. Shang, A. Bannis, T. Liang, Z. Wang, Y. Yu, A. Afanasyev, J. Thompson, J. Burke, B. Zhang, and L. Zhang. Named Data Networking of Things (Invited Paper). IEEE IoTDI 2016, April 4-8, Berlin, Germany.

Paper's key ideas

- Challenges we see
 - Complex Solutions to Simple Communication Needs
 - Limitations of Channel- and Session-based Security
 - Poor Integration of Local Communication
- NDN Approach to This
 - Name Things, Devices, and their Devices
 - Primary: Quantities, Objects of Interest, Areas, Principals(?)
 - Secondary: Devices themselves
- Basic pieces
 - Basic Protocol: Named Data Retrieval
 - Data-centric Security
 - Name-based Forwarding
 - In-network Storage
- Getting to a framework
 - Bootstrapping & Discovery (device names => local names => global names)
 - Schematized trust (leverage names/hierarchy to organize trust)
 - Name-based access control
 - Data aggregation (based on names)
 - ...

Summary of this morning

1. Pub / sub (VI-F)
2. Sync for IoT (VI-G)
3. Gateway approach (VI-H)
4. Multiple hierarchies (VIII-A)
5. Routing in infrastructureless environs (VIII-B)
6. Challenges of constrained devices (VIII-C)
7. Push-style communication (VIII-D)

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Charge to Groups

1. Re-articulate the problem in terms of the specific use case.
2. Come up with a solution, in keeping with proposed NDN design principles, that could be *built* in 6 months, with what we know now.
 1. Frame your solution in terms of the key concepts for IoT on NDN.
 2. Describe the solution in terms of the use case.
 3. Describe and address important security considerations.
 4. List critical dependencies (which may not exist) for your solution.
3. Based on the limitations of your solution, articulate a small number of *specific* research areas for a 1-2 year timeframe.

Output: 2-3 slides.