ITU Kaleidoscope 2015

Trust in the Information Society

Seamless mobility in Data Aware Networking

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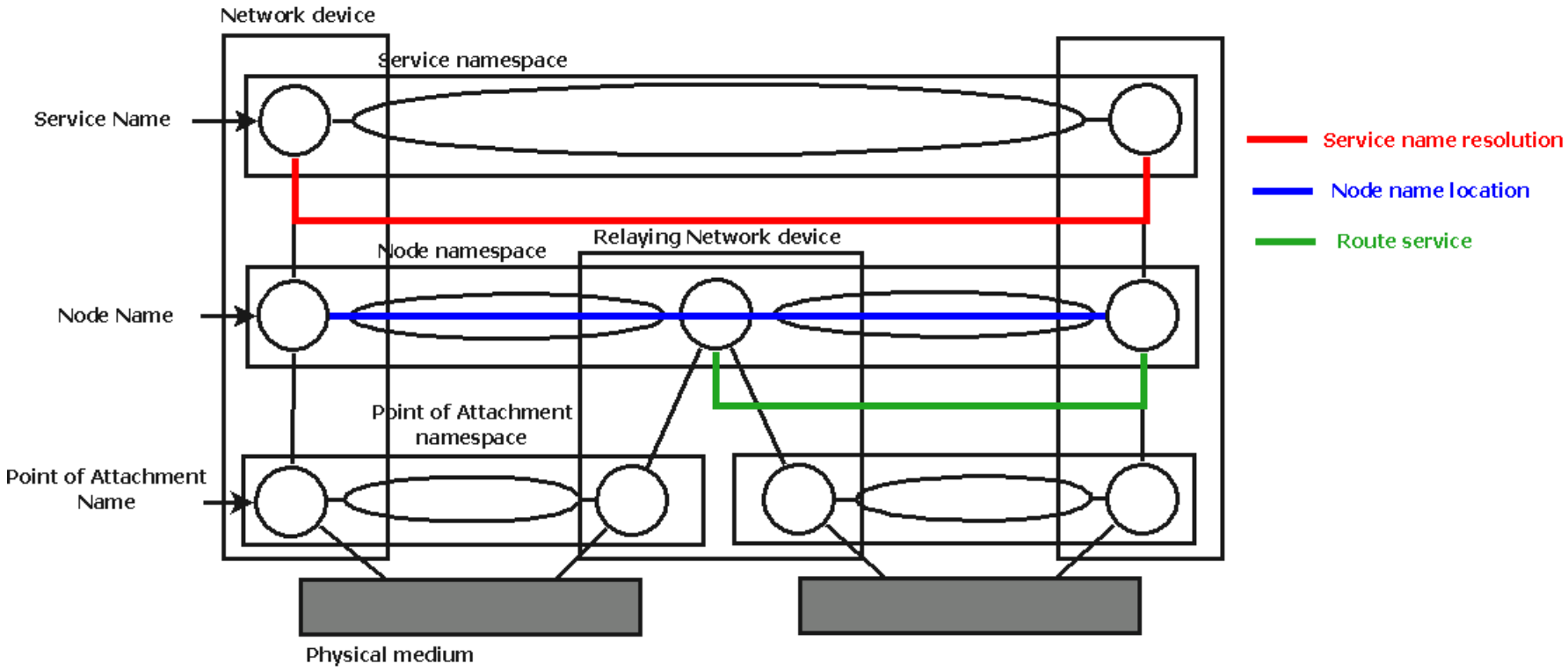
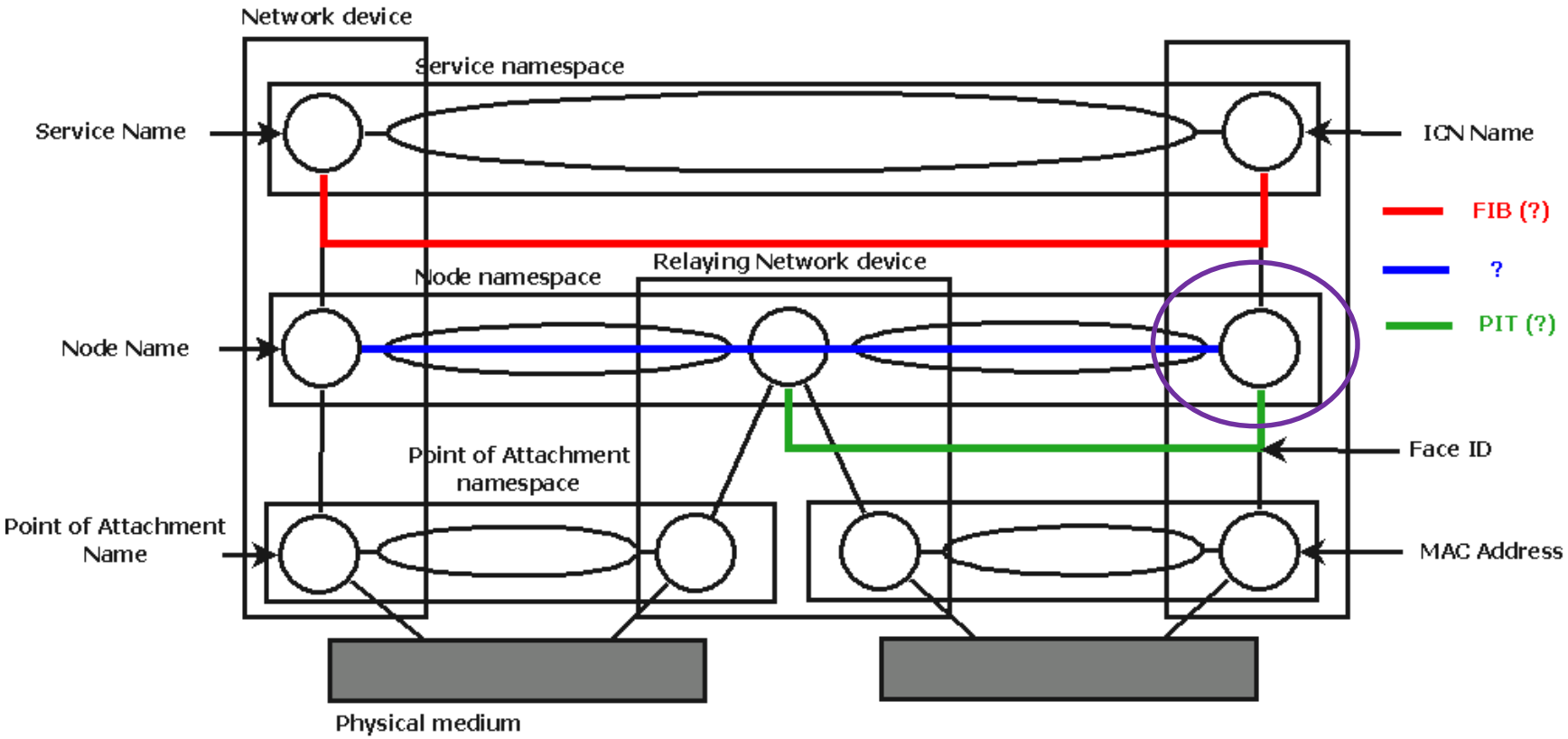
RFC 1498 – John Saltzer



RFC 1498 – John Saltzer

- The mappings seem to be more important than the temporary names of objects

RFC 1498 mapping to DAN



Named node namespace for DAN architecture

- It is desired that Node name be
  - Location dependent
    - Node names are used to locate nodes relative to each other
  - Be partially ordered
    - When deciding routes, I should be able to pick hops that are closers to my "destination"
  - Have a distance function
    - I should be able to pick the shortest route available
  - Be aggregatable

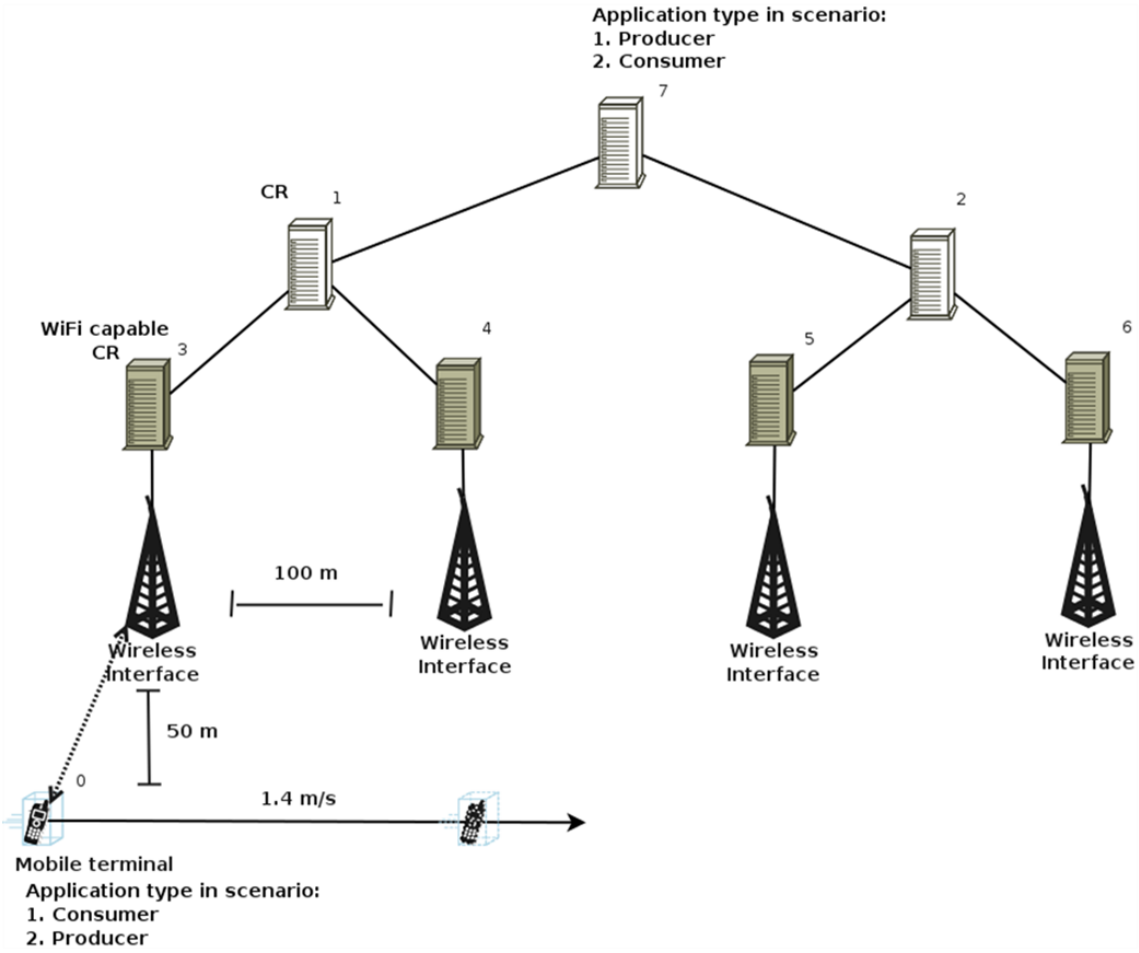
Named node namespace for DAN architecture

- The namespace must be managed
  - We cannot keep all prior properties if one can freely choose node names!
- These properties can be achieved in a metrizable hierarchical topological naming scheme
- We call a name from our created namespace a 3N name

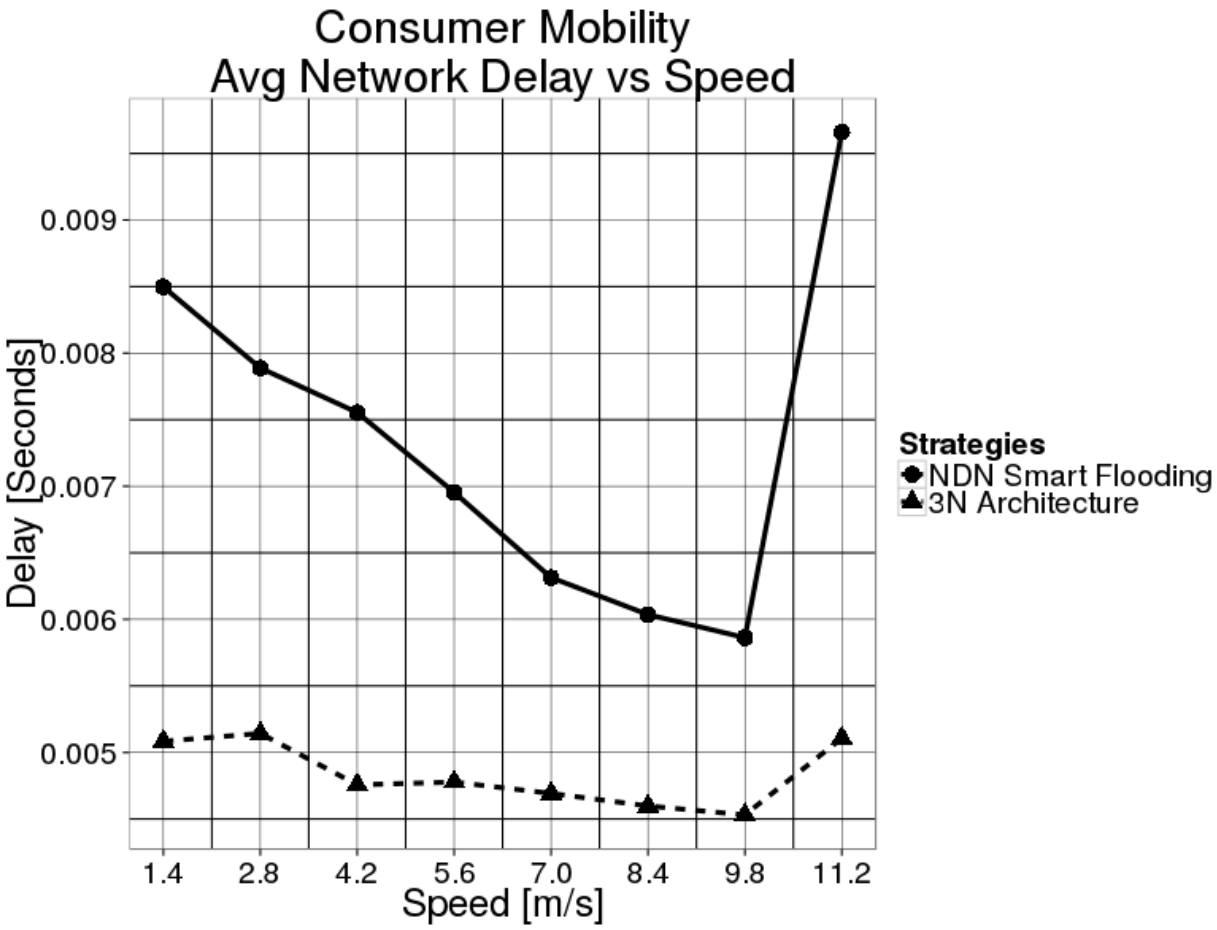
Complete mappings and create supporting structures to support mobility

- Create Named Node Signature Table (NNST) and aggregating 3N names to Pending Interest Table (PIT)
  - Completes Route mapping (3N name to PoA name)
- Create Named Node Pair Table (NNPT)
  - Completes Node name location mapping (3N name to 3N name)
- Create all necessary Protocol Data Units (PDUs) to update and mappings and to use the new namespaces for routing

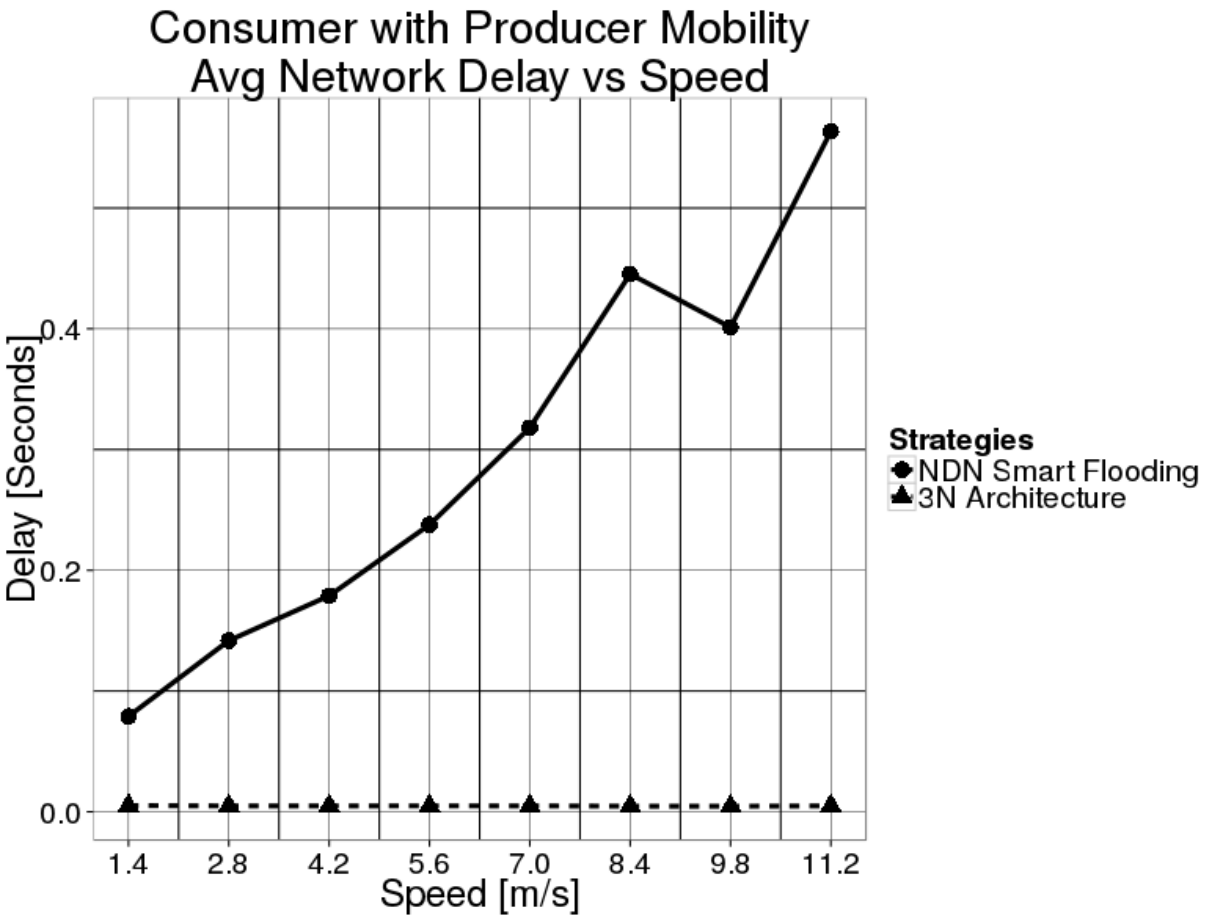
Simulation


Application type in scenario:
1. Producer
2. Consumer
7
CR
1
2
WiFi capable
CR
3
4
5
6
100 m
Wireless
Interface
Wireless
Interface
Wireless
Interface
Wireless
Interface
50 m
0
1.4 m/s
Mobile terminal
Application type in scenario:
1. Consumer
2. Producer

Results


Consumer Mobility
Avg Network Delay vs Speed
Delay [Seconds]
0.009
0.008
0.007
0.006
0.005
1.4
2.8
4.2
5.6
7.0
8.4
9.8
11.2
Speed [m/s]
Strategies
NDN Smart Flooding
3N Architecture

Results


Consumer with Producer Mobility
Avg Network Delay vs Speed
Delay [Seconds]
0.0
0.2
0.4
1.4
2.8
4.2
5.6
7.0
8.4
9.8
11.2
Speed [m/s]
Strategies
NDN Smart Flooding
3N Architecture

Discussion

- How we name things in a network architecture is very important
  - The resulting flow of packets is using information from the ICN names, 3N names and PoA names.
- The use of complete a Node name location and Route mappings along with 3 independent namespaces brings us many benefits
  - Improves even cases where a normal DAN is strongest
  - Makes producer mobility completely viable
  - Improves network efficiency since it doesn't require excessive flooding
  - Leaves the current Service namespace untouched

Thank you for your attention!

- Questions?