Named Data Networking

Writing NDN Applications and Forwarding Strategies
Outline

• Part 1: “Hello World” application with PyNDN2

• Part 2: Implementing a forwarding strategy
NDN Components

- Apps
- Routing
- Repo

Libraries

NFD

Links and Tunnels
“Hello World” App Overview

- Consumer and Producer apps running on the same NFD instance
- Extend to show sequencing and pipelining
Hello World Walkthrough
Outline

• Part 1: “Hello World” application with PyNDN2

• Part 2: Implementing a new forwarding strategy

• Step-by-step guide and code available at: https://github.com/dibenede/NFD-ICN2014
NDN Components

Applications (Apps)
Routing
Repository (Repo)
Libraries
NFD
Links and Tunnels
Forwarding Strategies

• Per namespace “programs” that choose how to forward Interests
  o E.g. lowest cost Face, random Face, etc.

• Closed control loop
  o Decision for Interest forwarding
  o Feedback when
    • Data arrives or Interest expires
  o Can store states.

• One strategy per namespace
  o Local to the node
  o Configured via management commands
Random Load Balancer

- Randomly select a nexthop
- Stateless
Random Load Balancer Walkthrough
Delay-based Weighting

- Remember RTT from each next hop to bias future Interests towards faster paths

- **Stateful:**
  - Start clock on Interest forwarding and stop on Data return
  - Store per next hop measurements
Weighted Load Balancer
Walkthrough
Summary

• Consistent APIs make it easy to prototype and rewrite for performance later

• NFD supports both stateless and stateful forwarding strategies