NDN Testbed
Status Update
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John DeHart
Washington University
jdd@wustl.edu
NDN Testbed

- Shared resource for running NDN experiments
- Each node runs an NDN software router:
  - nfd : NDN Forwarding Daemon
  - NLSR : NDN Routing Daemon
    - Recently updated to do Hyperbolic Routing
  - Other assorted NDN daemons

- Participating sites:
  - Dedicate a machine (real or virtual) to host a node
  - Designate a person as local operator for rare manual intervention and for site-based certificate approval

- Managed by NDN team at Washington U.

- Usable by All
  - Site-based certificates
  - Network guest certs
  - Many sites support local guest certs
NDN Testbed: March 2017

- Consists of 33 Gateway Router Nodes
  - March 2017: 33
  - March 2016: 31
  - March 2015: 24
  - Sept. 2014: 18
  - Nov. 2013: 16

- Presence on 4 Continents and in 15 Countries
  - North America (13)
    - USA (13)
  - South America (1)
    - Brazil (1)
  - Asia (9)
    - China (2)
    - S. Korea (2)
    - Japan (2)
    - Indonesia (1)
    - Thailand (2)
  - Europe (10)
    - France (2)
    - Italy (1)
    - Spain (1)
    - Switzerland (1)
    - Norway (1)
    - Germany (1)
    - Portugal (2)
    - Netherlands (1)
Joining the NDN Testbed

Who should join?

- Groups from Universities, Companies and Gov. Agencies
  - Who are interested in NDN R&D
- We look for a PI with an NDN interest/commitment
  - We are leary of requests like
    “I’m a graduate student doing a project”
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» https://named-data.net/ndn-testbed/policies-connecting-nodes-ndn-testbed/
  • Email link to make a request to join
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**What happens next?**
- A questionnaire to fill out will be emailed to you
- Request is reviewed by an NDN project committee
- When approved we work with you to install and connect your node.
Status Monitoring Sites

- Node and Prefix Status
  » [http://www.arl.wustl.edu/~jdd/ndnstatus/ndn_prefix/tbs_ndnx.html](http://www.arl.wustl.edu/~jdd/ndnstatus/ndn_prefix/tbs_ndnx.html)

- Bandwidth
  » [http://ndnmap.arl.wustl.edu/](http://ndnmap.arl.wustl.edu/)

- Routing Status
  » [http://netlab.cs.memphis.edu/script/htm/ndn-status/status.htm](http://netlab.cs.memphis.edu/script/htm/ndn-status/status.htm)

- Cacti graphs
  » [http://ndndemo.arl.wustl.edu/cacti/](http://ndndemo.arl.wustl.edu/cacti/)
  » Expanded, but continues to be a work in progress
  » Data collected through NDN Interest/Data packets.
  » Monitors things like:
    - Load average, / and /boot disk usage
    - NFD process size, uptime, PIT counter, NameTree counter
    - Etc...
  » User: guest
  » PW: ndnTest
  » Examples on next slide...
Cacti graph examples
Management Change: Ansible

- Previous Management
  » Via git, ssh and lots of hands-on updates.

- New Scheme: Ansible
  » [https://www.ansible.com/](https://www.ansible.com/)
  » Management, Provisioning and Deployment engine
  » One point of control
    • Uses ssh to connect to remote nodes.
  » Playbook for maintaining NDN Testbed
    • Defines tasks:
      – Install packages and daemons
      – Configure
      – Start/Restart
  » Each node has a defined set of variables
    • Used as parameters to Templates to generate conf files
Coming Soon: Expansion into Amazon AWS

- **AWS AMI for NDN gateway node and client.**
  - Develop for use across range of AWS instance sizes.

- **Maintain 1 NDN GW in each of 12 regions**
  - Regional gateway nodes maintained via Ansible

- **Develop Ansible playbook for**
  - Deploying NDN clients in AWS
  - Deploying NDN GWs in AWS

- **All Ansible playbooks for AWS and all AWS AMIs to be made available to the NDN community**
Questions?