



Network Development and Deployment Initiative (NDDI) Update Kunming, China August 9, 2011

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Network Development and Deployment Initiative (NDDI)

Partnership that includes Internet2, Indiana University, and the Clean Slate Program at Stanford

Builds on NSF's support for GENI and Internet2's BTOP-funded backbone upgrade

Seeks to create a software defined advanced-services-capable network substrate to support network and domain research [note, this is work in progress]

Components of the Network Substrate

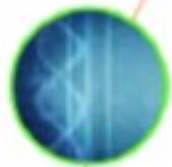
- 30+ high-speed Ethernet switches deployed across the upgraded Internet2 network and interconnected via 10G waves
- A common control plane being developed by IU, Stanford, and Internet2
- Production-level operational support
- A service layer that supports persistent Layer 2 VLANs and is interoperable with other control plane frameworks (e.g., IDC, NSI, etc.)

The Control Plane

- The control plane is key to placing the forwarding behavior of the NDDI substrate under the control of the community (community defined networking)
- Based on open standards (e.g., openflow, IDC, etc.)
- Goal to fully virtualize control plane to enable substrate slices

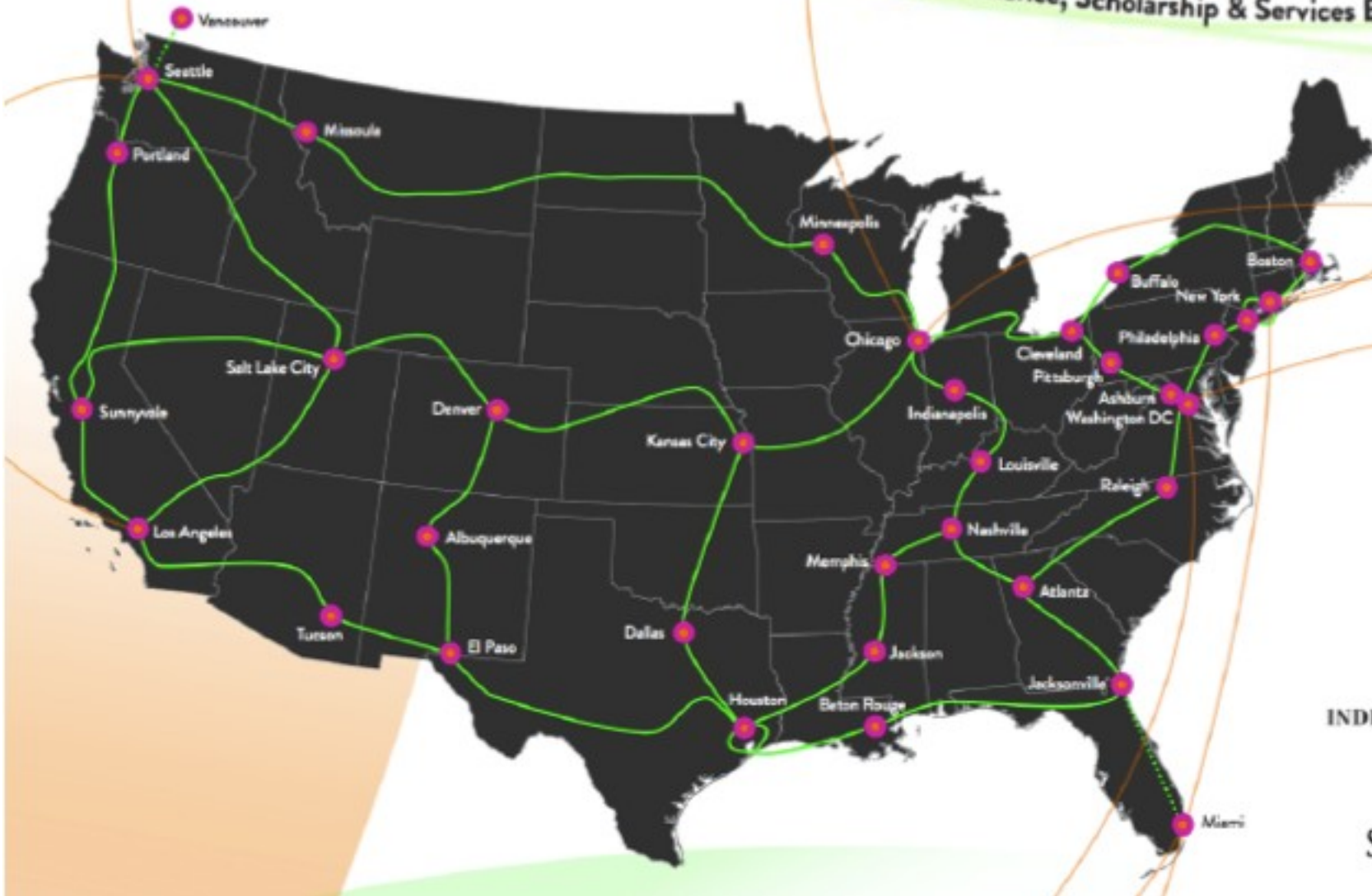
Open Science, Scholarship and Services Exchange (OS3E)

- An example of a community defined network service
- Built on the NDDI substrate (may use a slice when virtualization is available)
- A nationwide distributed layer 2 exchange
- The OS3E will connect Internet2 members with international exchange points and key collaborating partners via a flexible, open policy layer 2 network.
- Production services designed to support the needs of domain science (e.g., LHCONE)



OS³E

The Open Science, Scholarship & Services Exchange



INTERNET[®]



INDIANA UNIVERSITY

STANFORD UNIVERSITY

Support for Network Research

- NDDI substrate control plane key to supporting network research
 - at-scale, high performance, researcher-defined network forwarding behavior
 - virtual control plane provides the researcher with the network “LEGOs” to build a custom topology employing a researcher-defined forwarding plane
- NDDI substrate has the capacity and reach to enable large testbeds

NDDI is Global

- Substrate will support IDC (i.e., it will be inter-domain capable)
- While the initial partnership is US-based, NDDI is seeking global partners that can contribute to the substrate infrastructure as well as control plane features
- Currently collecting contact information for those interested in being a part of NDDI (please send e-mail to nddi-intl@internet2.edu)



Thank you