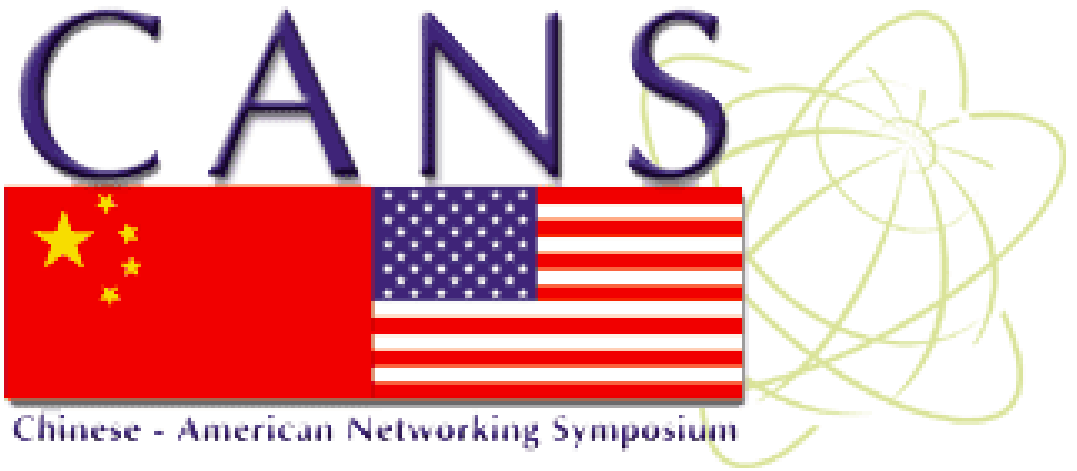

Network Development and Deployment Initiative (NDDI) Update
Kunming, China August 9, 2011

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Indiana University
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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

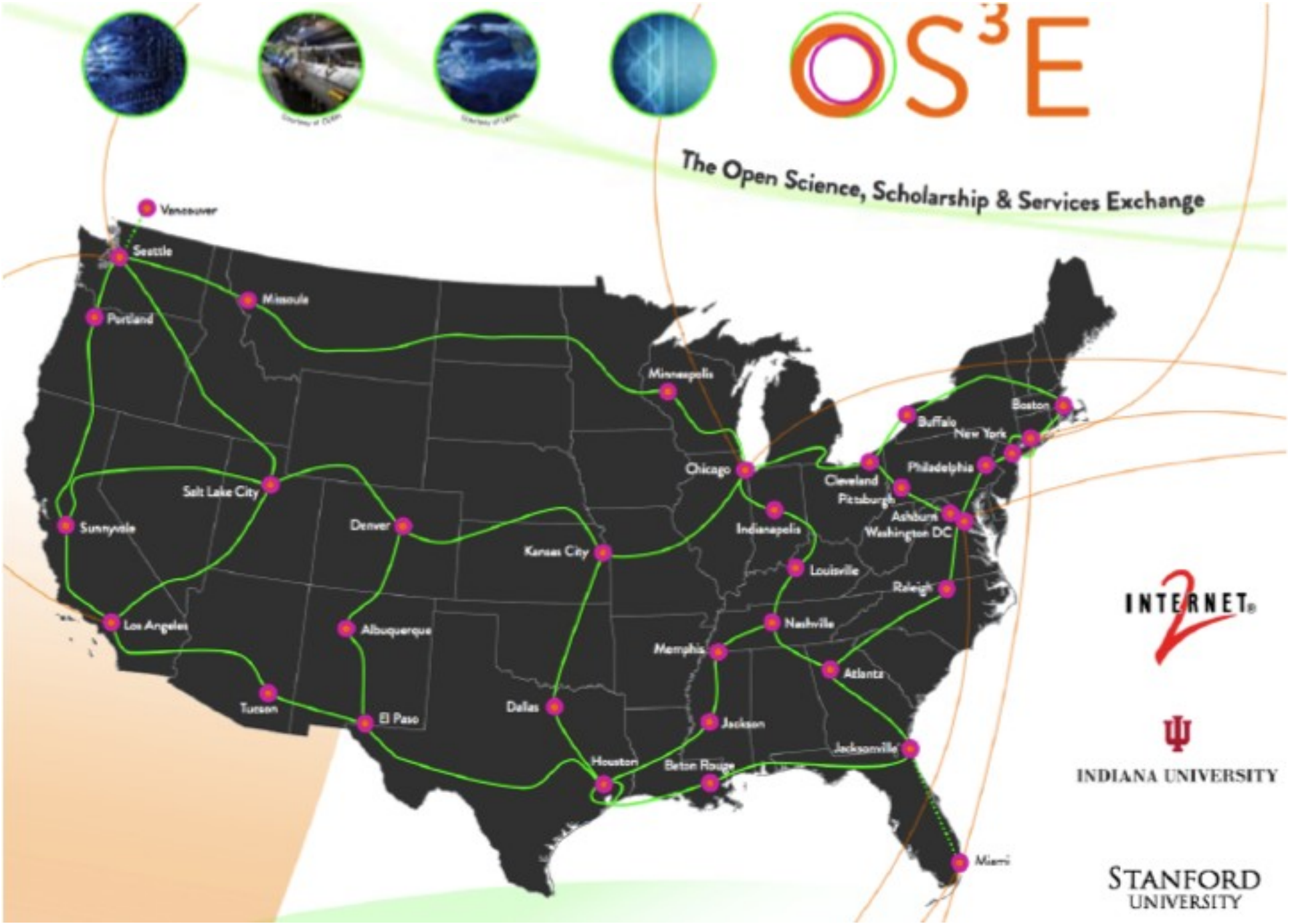
- 30+ high-speed Ethernet switches deployed across the upgraded Internet2 network and interconnected via 10G waves
- A common control plane being developed by IU, Stanford, and Internet2
- Production-level operational support
- A service layer that supports persistent Layer 2 VLANs and is interoperable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

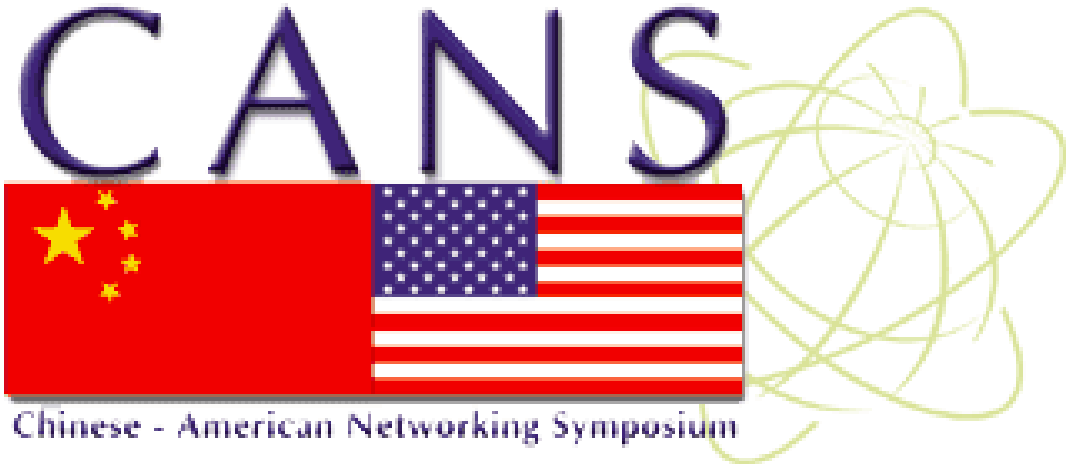

OS3E
The Open Science, Scholarship & Services Exchange
Vancouver
Seattle
Portland
Missoula
Minneapolis
Chicago
Buffalo
Boston
New York
Cleveland
Philadelphia
Pittsburgh
Ashburn
Washington DC
Salt Lake City
Sunnyvale
Denver
Kansas City
Indianapolis
Louisville
Raleigh
Los Angeles
Albuquerque
Nashville
Memphis
Atlanta
Tucson
El Paso
Dallas
Jackson
Jacksonville
Houston
Baton Rouge
Miami
INTERNET2
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