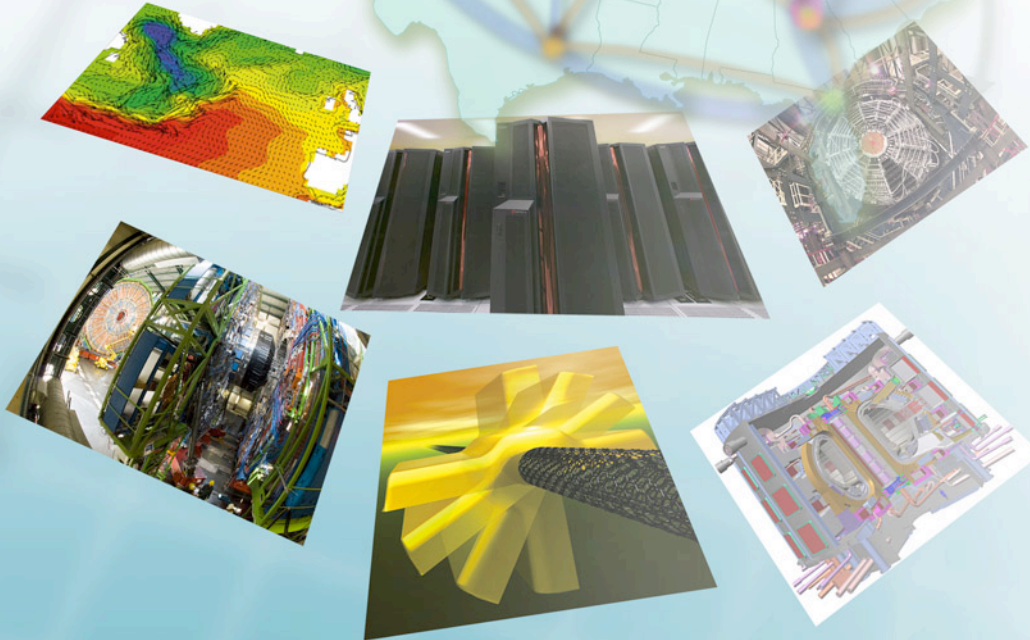


# ESnet On-demand Secure Circuits and Advance Reservation System (OSCARS)

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***Networking for the Future of Science***



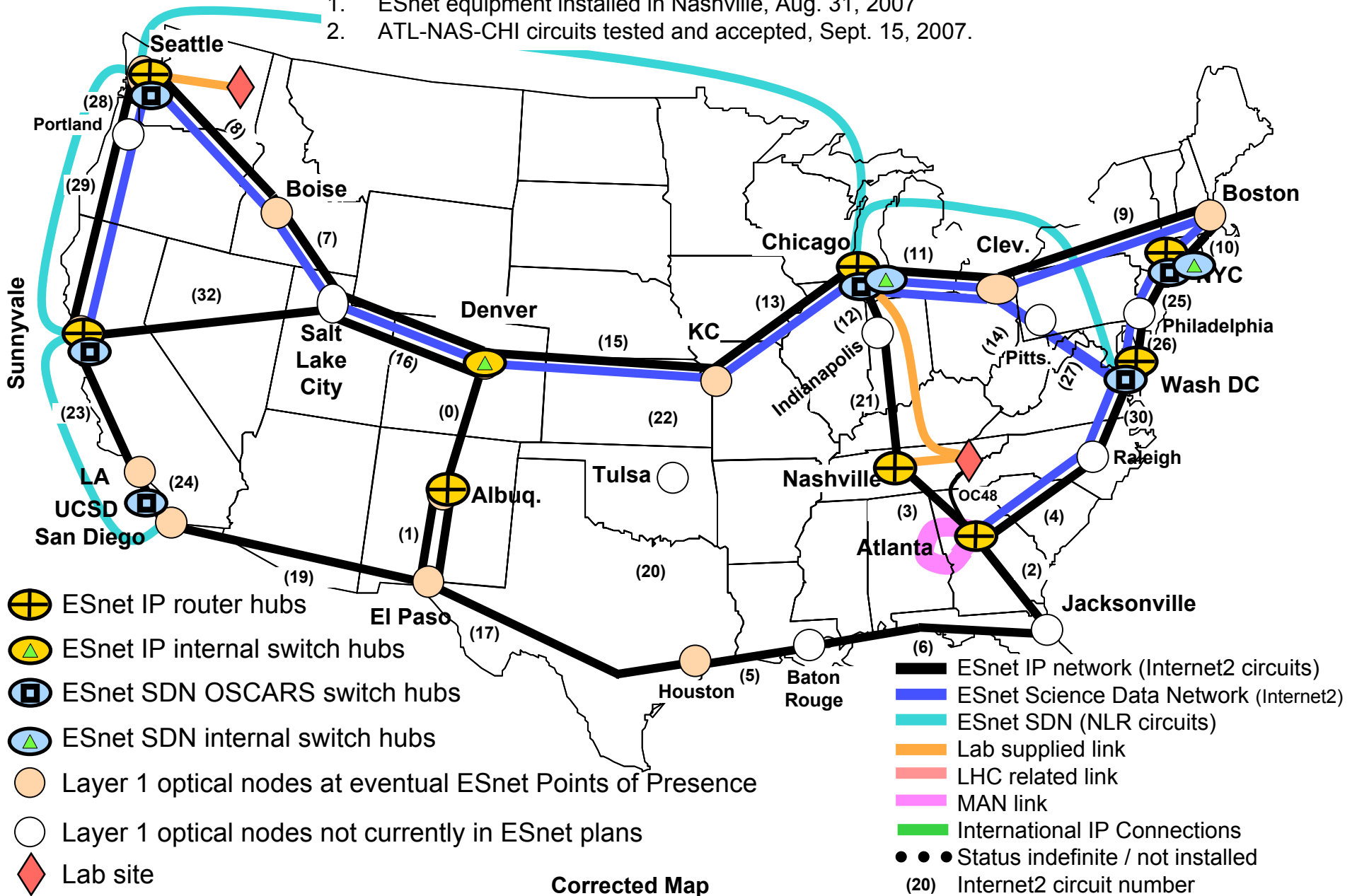
## Requirements for Virtual Circuit Services

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- **Identified as one of the two most important new network service by the 2002 science requirements workshop (the other being end-to-end performance monitoring)**
- ***Dynamically provisioned virtual circuits that provide:***
  - Traffic Isolation
    - Will enable the use of high-performance, non-standard transport mechanisms that cannot co-exist with commodity TCP based transport. (see, e.g., Tom Dunigan's compendium <http://www.csm.ornl.gov/~dunigan/netperf/netlinks.html> )
  - Guaranteed Bandwidth
    - The only way that we have currently to address deadline scheduling – e.g. where fixed amounts of data have to reach sites on a fixed schedule in order that the processing does not fall behind far enough so that it could never catch up – very important for experiment data analysis.

# ESnet4 IP + SDN Configuration and Roll Out (2007)

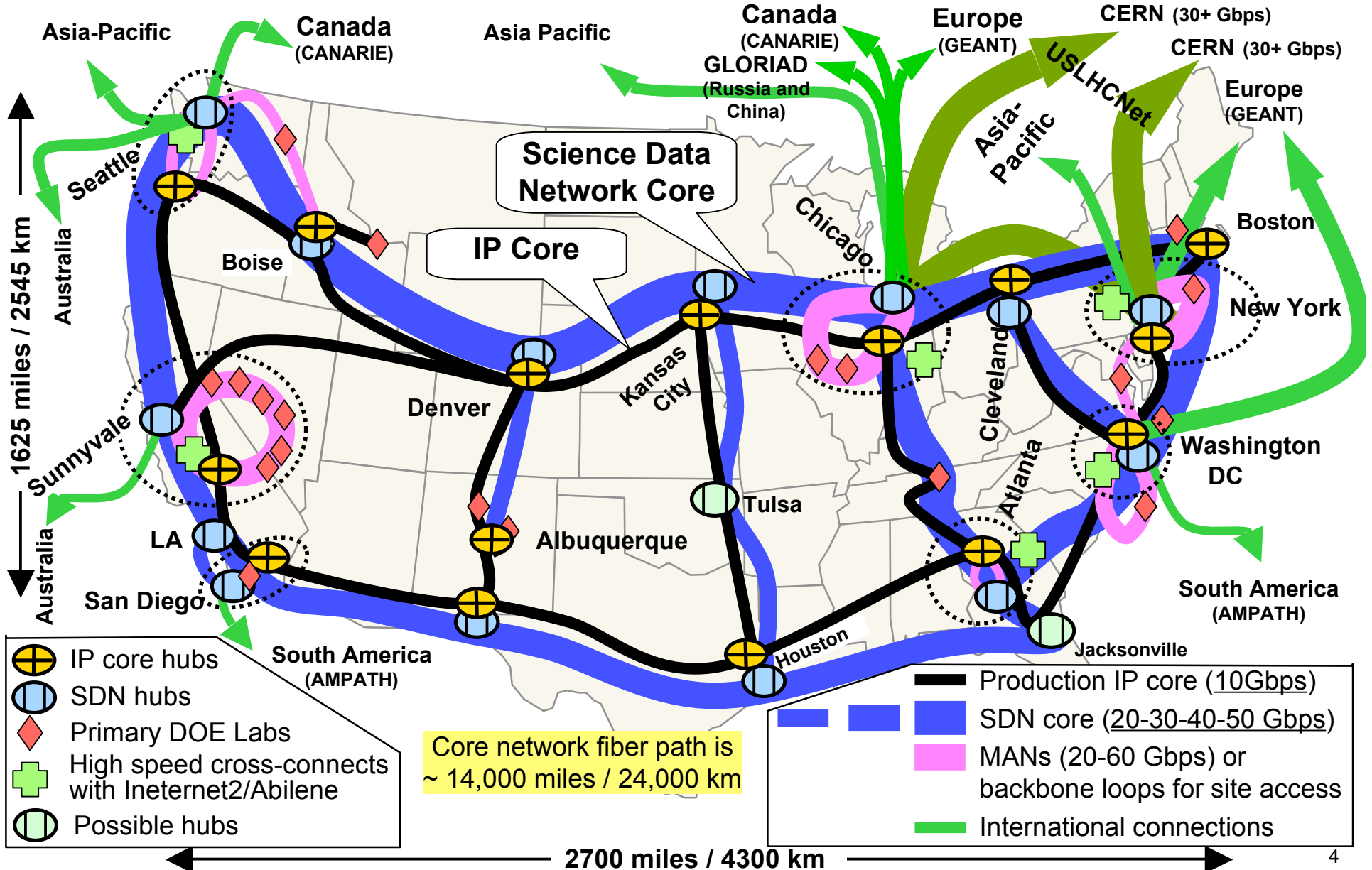
1. ESnet equipment installed in Nashville, Aug. 31, 2007
2. ATL-NAS-CHI circuits tested and accepted, Sept. 15, 2007.



Corrected Map

# ESnet4

Core networks 50-60 Gbps by 2009-2010 (10Gb/s circuits),  
500-600 Gbps by 2011-2012 (100 Gb/s circuits)



# OSCARS Status

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- **ESnet Centric Deployment**

- Prototype layer 3 (IP) guaranteed bandwidth virtual circuit service deployed in ESnet (1Q05)
- Layer 2 (Ethernet VLAN) virtual circuit service under development (4Q07)

- **Inter-Domain Collaborative Efforts**

- Control/Data Plane Exchange
  - TeraPaths (BNL)
    - Inter-domain interoperability for layer 3 virtual circuits demonstrated (3Q06)
    - Inter-domain interoperability for layer 2 virtual circuits under development (4Q07)
  - HOPI/DRAGON (Internet2/ISI East)
    - Inter-domain exchange of control messages demonstrated (1Q07)
    - Initial integration of OSCARS and DRAGON has been successful (1Q07)
  - DICE (DANTE, Internet2, CANARIE, ESnet)
    - First draft of topology exchange schema has been formalized (in collaboration with NMWG) (2Q07), interoperability test scheduled for 4Q07
    - Drafts on reservation and signaling messages under discussion (4Q07)
  - Phosphorus (University of Amsterdam)
    - Integration of Token based authorization in OSCARS under discussion
  - LambdaStation (FNAL)
    - Initial exchange of design schemas (in collaboration with TeraPaths and HOPI/DRAGON) (3Q07)
  - DRAC (Nortel)
    - Interoperability testing is currently underway (4Q07)
- Measurements
  - OSCARS/USN/HOPI/DRAGON/TNTech
    - Hybrid Multilayer Network Data Planes network-layer testing and analysis (1Q07)

# OSCARS: Guaranteed Bandwidth Service

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- **Info URL: <http://www.es.net/oscars>**
- **Services URL: <https://oscars.es.net/OSCARS/>**
- **Contact:**
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  - Evangelios Chaniotakis ([haniotak@es.net](mailto:haniotak@es.net))