

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

*Chin Guok*  
*Presented by Joe Metzger*

Energy Sciences Network  
Lawrence Berkeley National Laboratory

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# OSCARS Overview

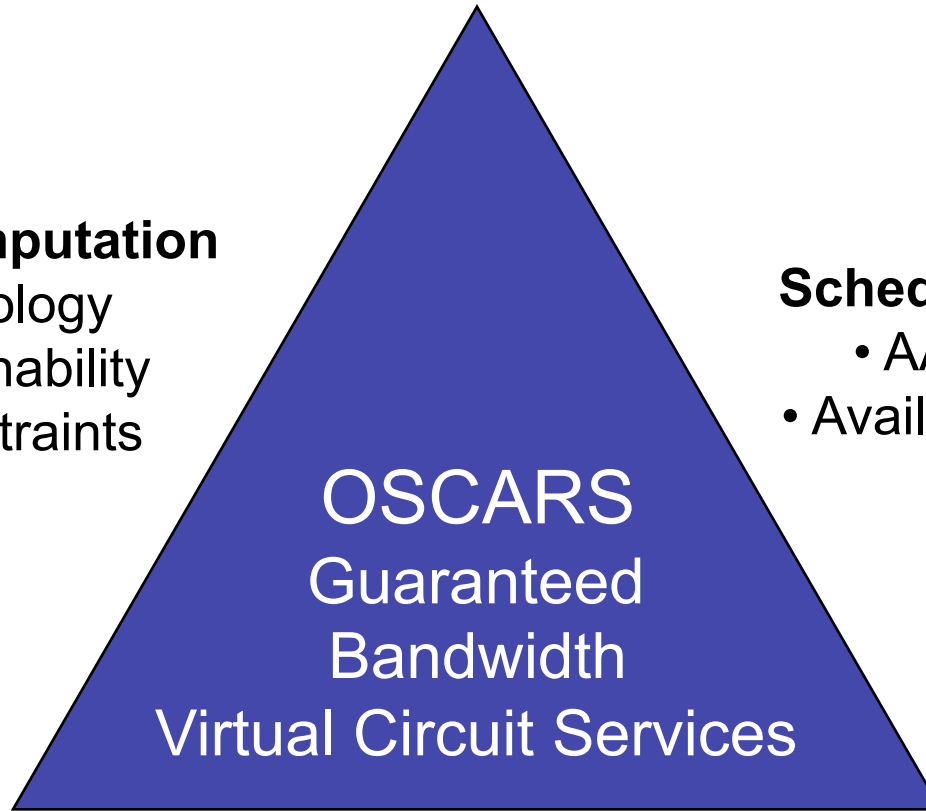
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## Path Computation

- Topology
- Reachability
- Constraints

## Scheduling

- AAA
- Availability



## Provisioning

- Signaling
- Security
- Resiliency/Redundancy

# Using OSCARS

- Web-Based User Interface (WBUI)
  - SSL connection to server
  - Username and password login

The screenshot shows the 'On-demand Secure Circuits and Advance Reservation System' web interface. The page title is 'Reservation creation form' and the date is 'July 13, 2007 16:04'. The form contains various input fields for reservation details, including source and destination IP addresses, ports, bandwidth, protocol, and reservation dates. A warning message states: 'WARNING: Entering a value in a red-outlined field may change default routing behavior for the selected flow.' The form fields are color-coded: green for required inputs, red for fields that may change routing behavior, and blue for optional fields.

- SOAP Messages
  - SSL connection to server
  - WSDL service description
  - Signed SOAP messages

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="OSCARS"
  targetNamespace="http://oscars.es.net/OSCARS"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap12/"
  xmlns:tns="http://oscars.es.net/OSCARS">

  <wsdl:documentation>
    This is WSDL for the OSCARS public reservation interface. These
    messages must be signed using the following WS-security
    standards. The message is time stamped and includes the X.509
    certificate of the signing entity. The timestamp, certificate
    and message body are all signed. DRAFT V1.0 Nov 2006
  </wsdl:documentation>

  <!-- Element definitions -->
  <wsdl:types>
    <xsd:schema targetNamespace="http://oscars.es.net/OSCARS"
      elementFormDefault="qualified"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema"
      xmlns:tns="http://oscars.es.net/OSCARS">
      <xsd:include schemaLocation="OSCARS.xsd" />
    </xsd:schema>
  </wsdl:types>

  ...
```

# The Mechanisms Underlying OSCARS

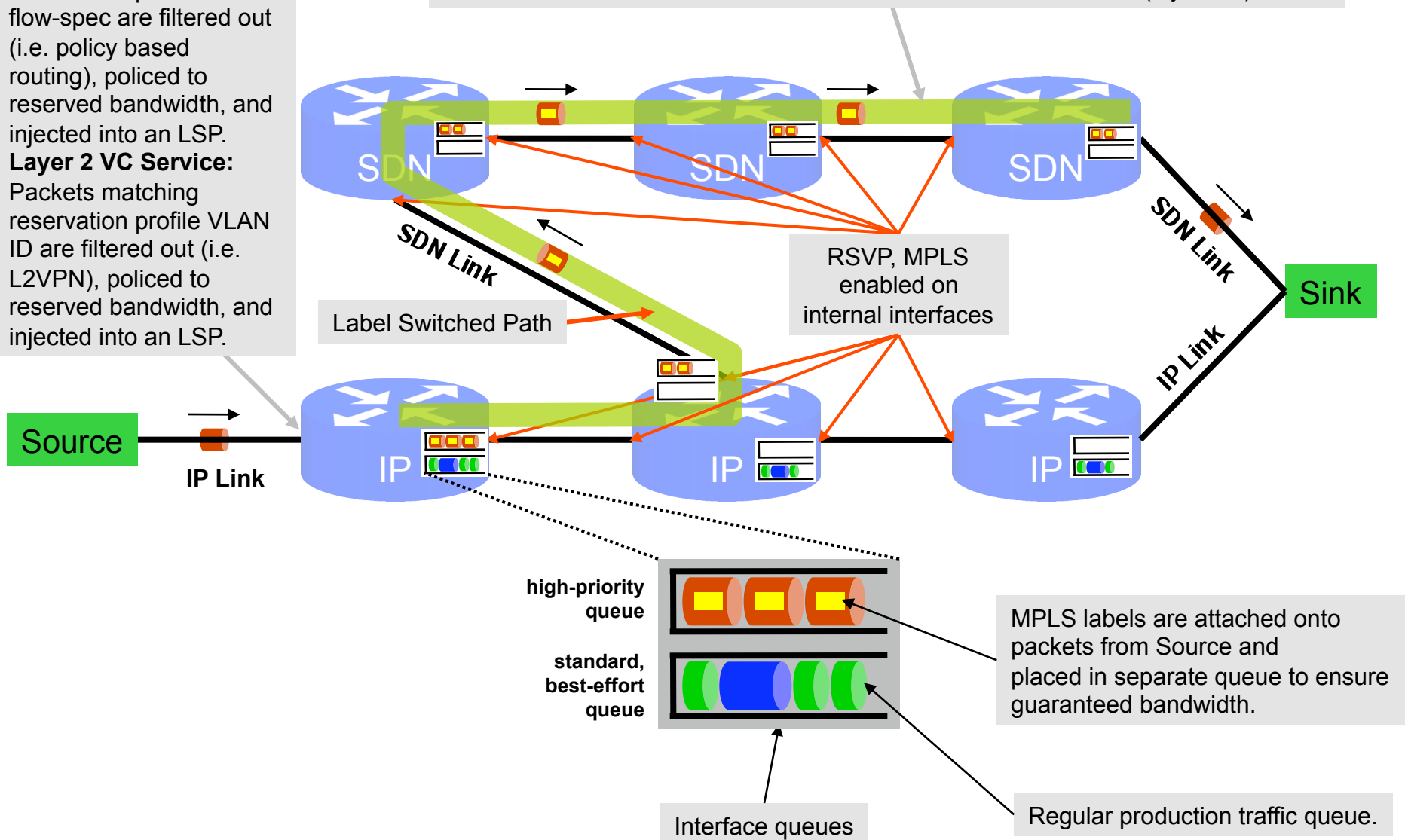
## Layer 3 VC Service:

Packets matching reservation profile IP flow-spec are filtered out (i.e. policy based routing), policed to reserved bandwidth, and injected into an LSP.

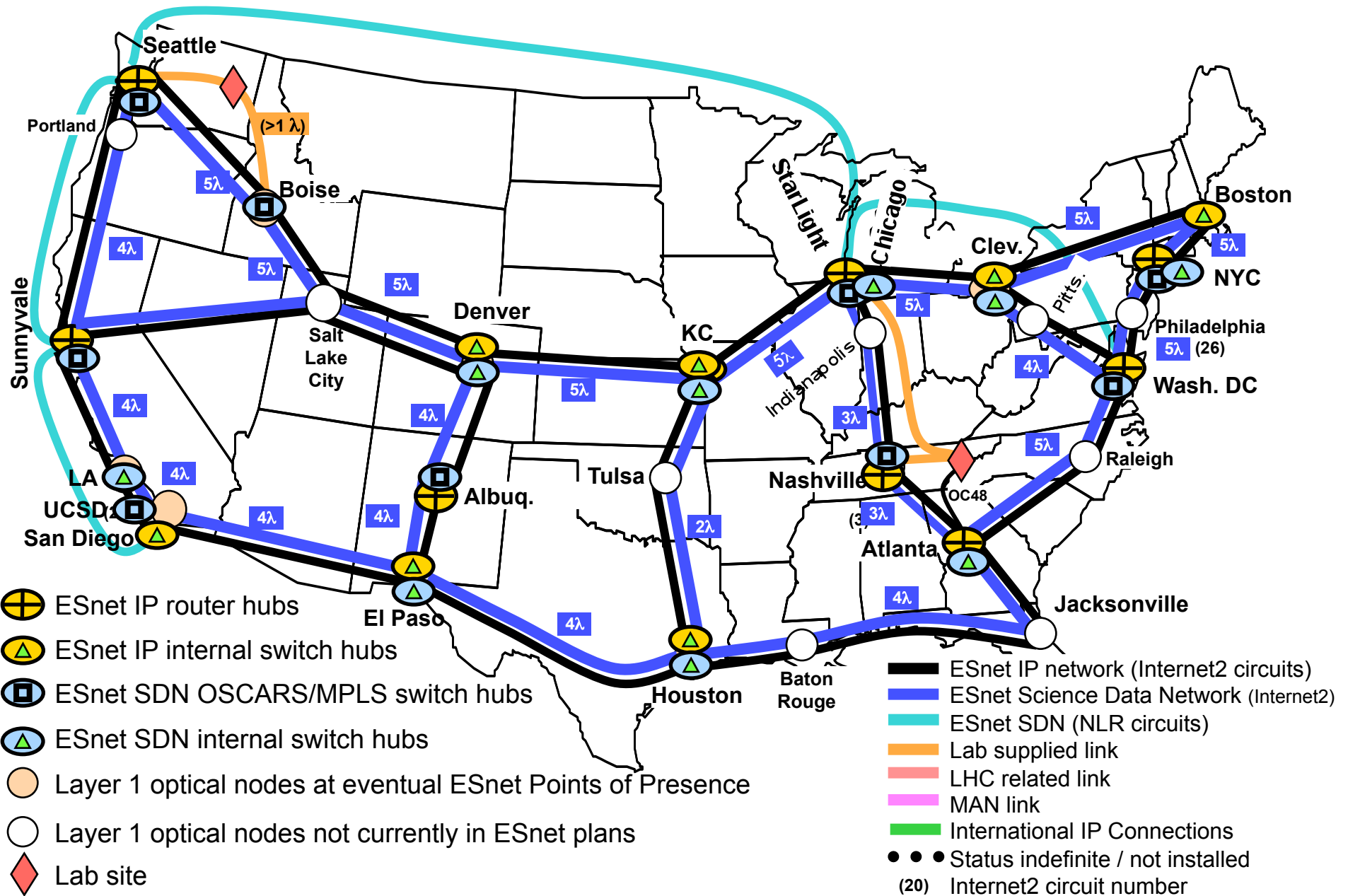
## Layer 2 VC Service:

Packets matching reservation profile VLAN ID are filtered out (i.e. L2VPN), policed to reserved bandwidth, and injected into an LSP.

LSP between ESnet border routers is determined using topology information from OSPF-TE. Path of LSP is explicitly directed to take SDN network where possible. On the SDN Ethernet switches all traffic is MPLS switched (layer 2.5).



# ESnet4 IP + SDN, 2011 Configuration (Est.)

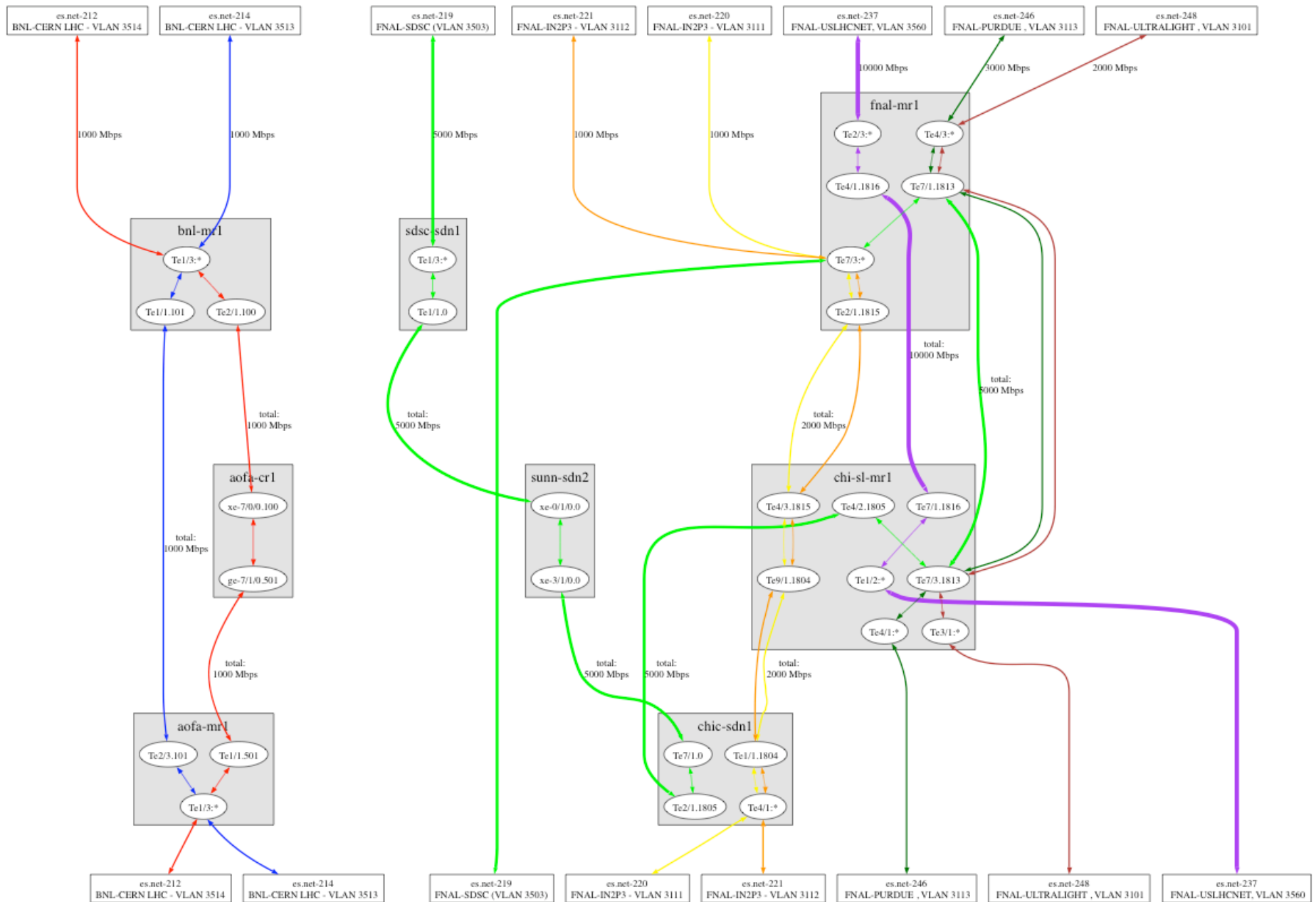


# OSCARS Status Update

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- ESnet Centric Deployment
  - Prototype layer 3 (IP) guaranteed bandwidth virtual circuit service deployed in ESnet (1Q05)
  - Prototype layer 2 (Ethernet VLAN) virtual circuit service deployed in ESnet (3Q07)
- Inter-Domain Collaborative Efforts
  - Terapaths
    - Inter-domain interoperability for layer 3 virtual circuits demonstrated (3Q06)
    - Inter-domain interoperability for layer 2 virtual circuits demonstrated at SC07 (4Q07)
  - LambdaStation
    - Inter-domain interoperability for layer 2 virtual circuits demonstrated at SC07 (4Q07)
  - I2 DCN/DRAGON
    - Inter-domain exchange of control messages demonstrated (1Q07)
    - Integration of OSCARS and DRAGON has been successful (1Q07)
  - GEANT2 AutoBAHN
    - Inter-domain reservation demonstrated at SC07 (4Q07)
  - DICE
    - First draft of topology exchange schema has been formalized (in collaboration with NMWG) (2Q07), interoperability test demonstrated 3Q07
    - Initial implementation of reservation and signaling messages demonstrated at SC07 (4Q07)
  - Nortel
    - Topology exchange demonstrated successfully 3Q07
    - Inter-domain interoperability for layer 2 virtual circuits demonstrated at SC07 (4Q07)
  - UVA
    - Demonstrated token based authorization concept with OSCARS at SC07 (4Q07)
  - OGF NML-WG
    - Actively working to develop draft schema to combine work from NMWG and NDL
  - GLIF Technology and Control WG
    - In process of developing dynamic services framework

# OSCARS Production Circuits (as of 20080407)



# OSCARS: Guaranteed Bandwidth Service

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- Funded by the DOE Office of Science
- Info URL: <http://www.es.net/oscars>
- Services URL: <https://oscars.es.net/OSCARS/>
- Contact:
  - Chin Guok ([chin@es.net](mailto:chin@es.net))
  - David Robertson ([dwrobertson@lbl.gov](mailto:dwrobertson@lbl.gov))
  - Evangelios Chaniotakis ([haniotak@es.net](mailto:haniotak@es.net))