SwitchOn Workshop
January 09th 2015

SDN @ AmLight:
How could it help your research?

Jeronimo A. Bezerra
Florida International University
<jbezerra@fiu.edu>

Tying everything together!

Regional R&E Networks:

- ANSP in Sao Paulo

National R&E Networks:

- RNP in Brazil
- ESNET and Internet2 in the U.S.

Academic IXP

- AMPATH in Miami
- SouthernLight in Sao Paulo

Optical Infrastructure

- Padtec

SDN & Ethernet Fabric

- Brocade

Missing link?

- AmLight

Describing AmLight SDN

4 x 10G links and two topologies:

- **SDN ring**: Miami-Sao Paulo-Chile-Miami
  - 20 Gbps of total capacity
  - Full Openflow and network virtualization support

- **MPLS ring**: Miami-Brazil-Miami
  - 20 Gbps of total capacity
  - Layer 2 support

- Soon: new **100 Gbps** between Sao Paulo and Miami
  - Part of the SDN domain
  - Focused on experimentation

- Total capacity in place for the next 2 year: **140 Gbps**
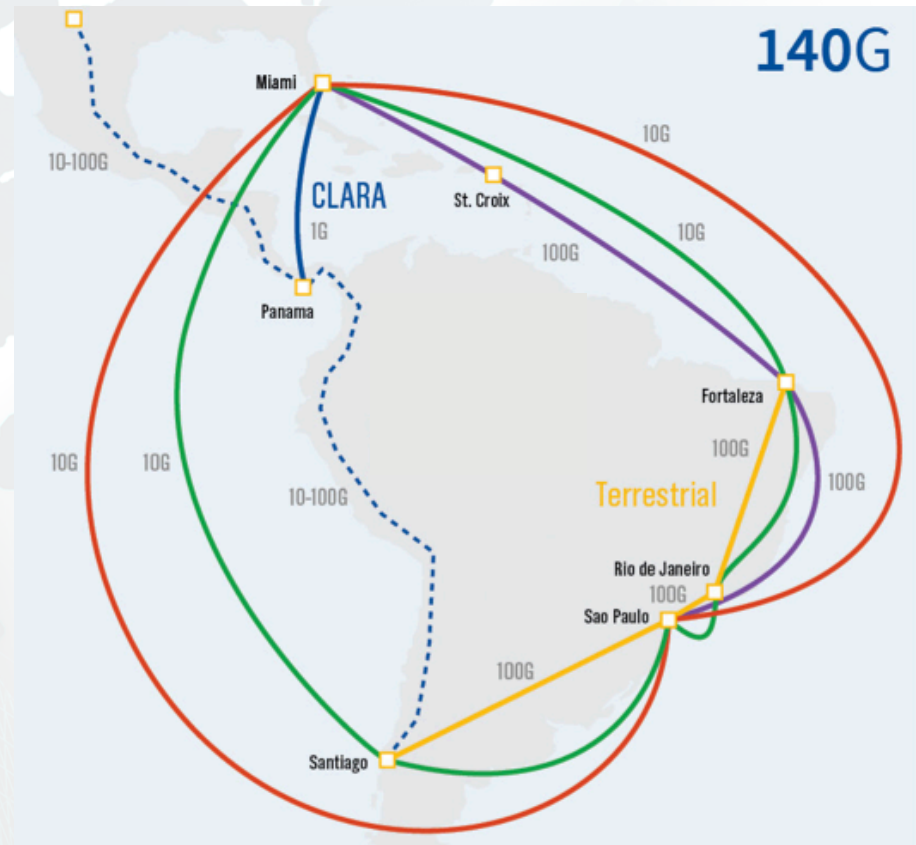
Programmability @ AmLight

Two possible interfaces to use AmLight:

- Openflow (1.0, 1.3 in the future)
  - Through dedicated slices
  - Real devices (Brocade)
  - Own VLAN range
  - Different virtual topologies available
  - Layer 2 or/and Layer 3 matches
  - Low level configuration

- NSI v2 – Network Service Interface
  - High level abstraction for layer 2 multi-domain provisioning
  - No need to know the topology and physical devices/configurations
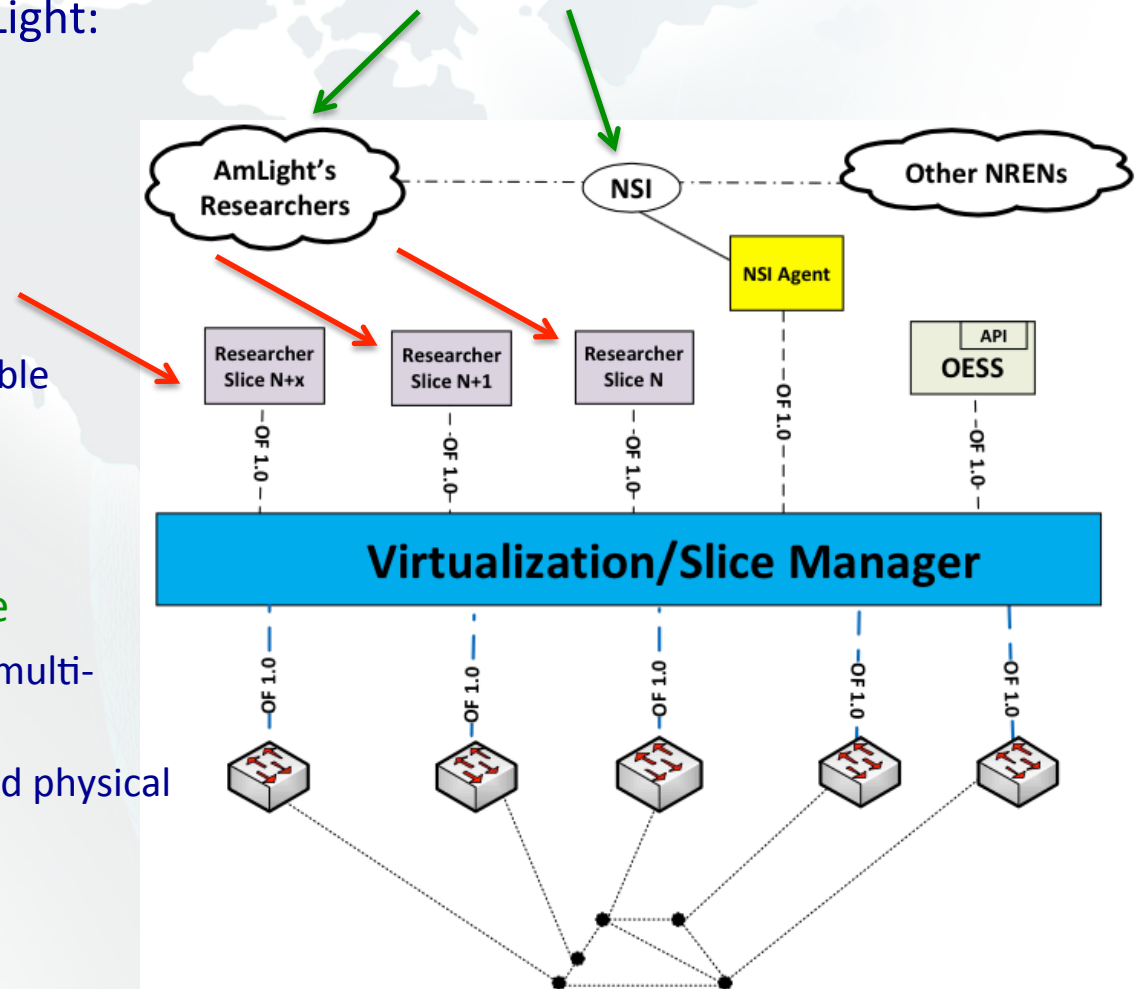
Facilitating Research

Why using AmLight as part of your testbed?

- Constant and long delay
  - 106 ms (rtt) Miami-Sao Paulo through Atlantic rim
  - 140 ms (rtt) Miami-Sao Paulo through Pacific rim

- Real devices, real challenges
  - With memory, CPU and interface limitations

- With a network slice using Openflow:
  - Different virtual topologies available
    - Ring, linear, star
  - Your own VLAN range
    - No need to contact NOC or Engineers for any provisioning activity

Research and Interesting Topics

Challenges for the near future at AmLight:

- **Quality of Service**
  – Bandwidth Guarantee in an Openflow/SDN
  – Dynamic application load-balance

- **Security**
  – Secure access with network virtualization
  – Isolation between applications

- **Networking**
  – Multipath TCP
  – Scalability
  – IP/IPv6/Multicast Routing
  – Inter-SDN domain forwarding (SDX)
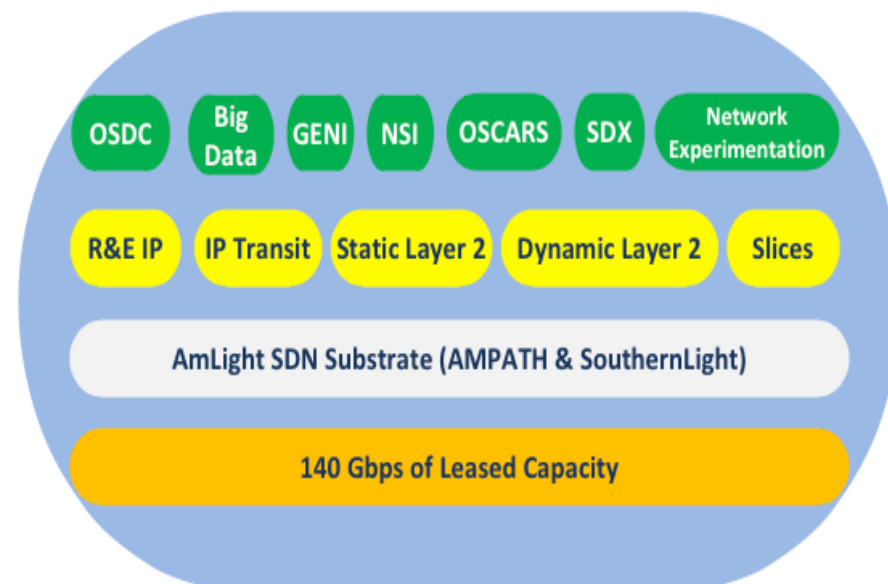
Your research might become a product part of AmLight!

SwitchOn Workshop
January 07th 2015

SDN @ AmLight:
How could it help your research?

Thank you!

More info: www.sdn.amlight.net

Jeronimo Bezerra
Florida International University
<jbezerra@fiu.edu>