AtlanticWave SDX

INTERNATIONAL DISTRIBUTED SOFTWARE-DEFINED EXCHANGE

GLIF Americas Working Group Meeting

September 19, 2018

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AtlanticWave-SDX
NSF IRNC Award #OAC-1451024

- AtlanticWave-SDX (Awave-SDX) is building a distributed intercontinental experimental SDX in response to a growing demand to:
  - Support end-to-end services capable of
    - Spanning multiple SDN domains
    - Dynamic provisioning of end-to-end circuits
    - Providing network programmability
  - Provide more intelligent network services to
    - Enable researchers to work more effectively
    - Increase network efficiency and resiliency

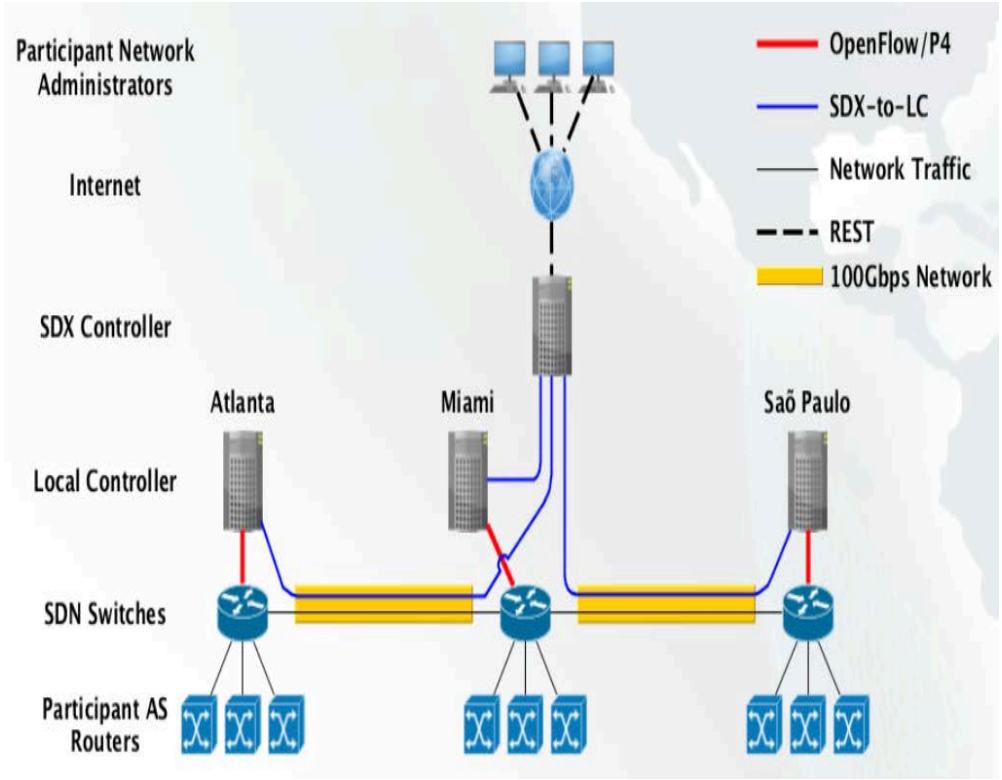
- Florida International University (FIU) and Georgia Institute of Technology (GT) are implementing AtlanticWave-SDX, in collaboration with other exchange points supporting SDN

Current Network Design

- The SDX Controller:
  - Interfaces with external requests
  - Generates requests to LC
  - Controls ~~three~~ four sites:
    - SOX - Atlanta
    - AMPATH - Miami
    - SouthernLight - Sao Paulo/Brazil
    - AndesLight - Santiago/Chile

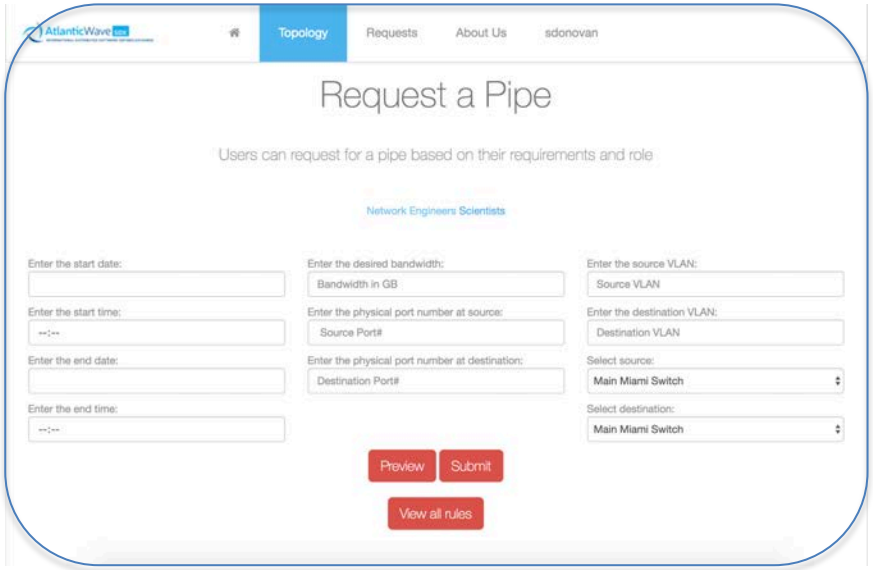
- Each site will have its Local Controller:
  - Bootstrapping switches
  - Discovering local topology
  - Southbound translation:
    - OpenFlow 1.3
    - Proprietary APIs
    - P4 Runtime API (future)

- In-band management:
  - Local Controllers will talk to SDX Controller in-band



Multiple Interfaces

- User requests via WEB UI or REST calls
- Interface for Network Engineers and Domain Scientists

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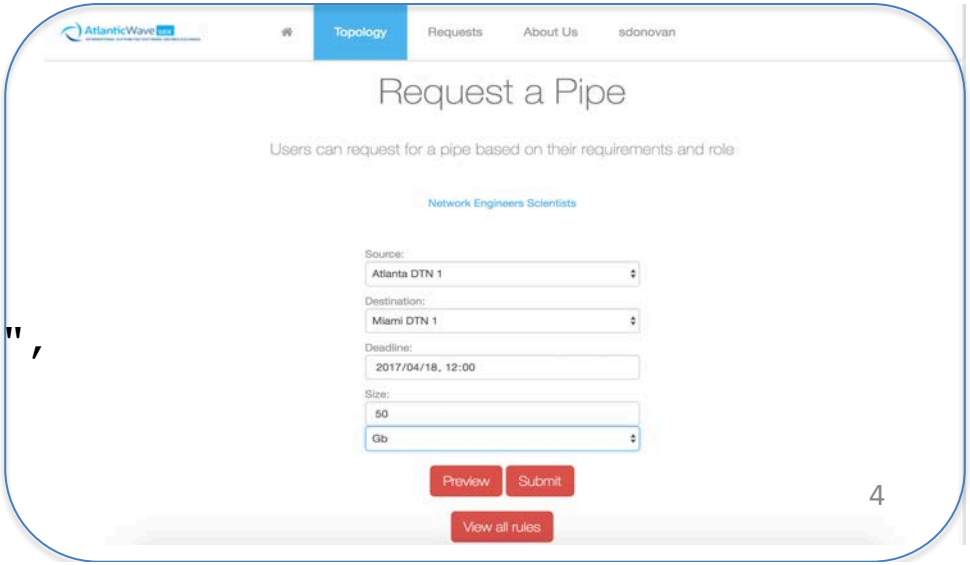


Current Features

- Southbound Interfaces: OpenFlow 1.3 and *Corsa (for meters and QoS)**
- Layer 2 Point-to-Point and *Point-to-Multipoint** circuits with bandwidth reservation
- Web UI and REST calls customized per user profile
- Compatibility with OpenVSwitch OpenFlow 1.3 implementation
- REST supporting HTML and *JSON** replies

- *Compatibility with Corsa OpenFlow 1.3 implementation**
- *Support for MAC Learning**
- *Support for complex data plane pipelines with multiple OpenFlow tables**
- *Support for arbitrary advanced rules**
- *Support for Docker and Vagrant images**

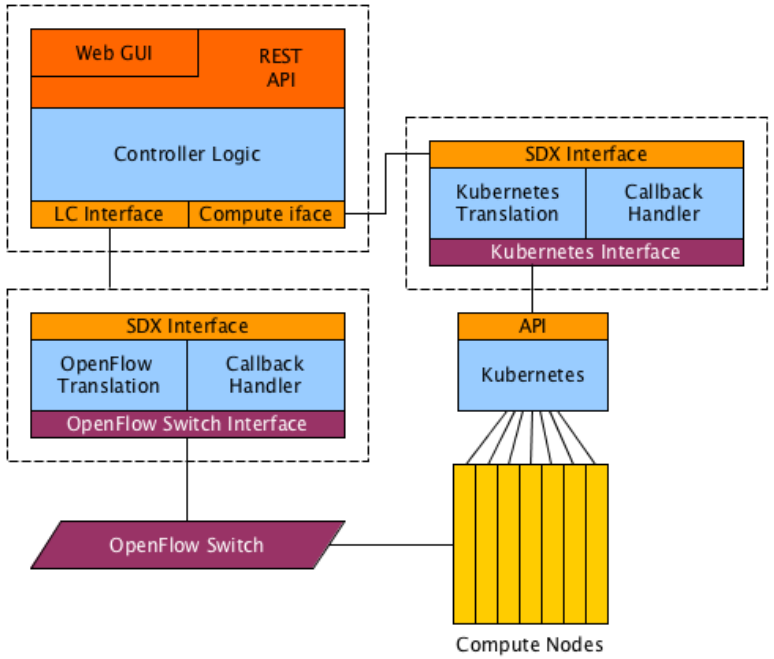
- *Support for Inbound NSI requests***
- Shibboleth**

- Github: https://github.com/atlanticwave-sdx/atlanticwave-proto

** Added in Year 3*
*** Prototypes*

Features Planned for Year 4

- Per-User Resource Authorization
- In-Band Controller Communication/Bootstrapping
- NSI Outbound via MEICAN
- *Investigation* of possible integration with compute resources



Deployment Plans for Year 4

- Installation of a Corsa switch in Sao Paulo/Brazil
- Installation of a Corsa switch in Santiago/Chile
- A L2VPN will be created connecting SOX to AMPATH via Internet2
- L2VPNs will connect AMPATH, AndesLight, and SouthernLight's Corsa switches
- An Awave-SDX prototype will connect all sites
- *Astronomers will be invited to try it out!*