



# SAACC Meeting Apr 11 2016: AmLight Updates

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# Outline

- **Part 1: A report on the AmLight network and its utilization by the SAACC community.**
- **Part 2: An update on the LSST End-to-end project.**

# Part 1: A report on the AmLight network and its utilization by the SAACC community.

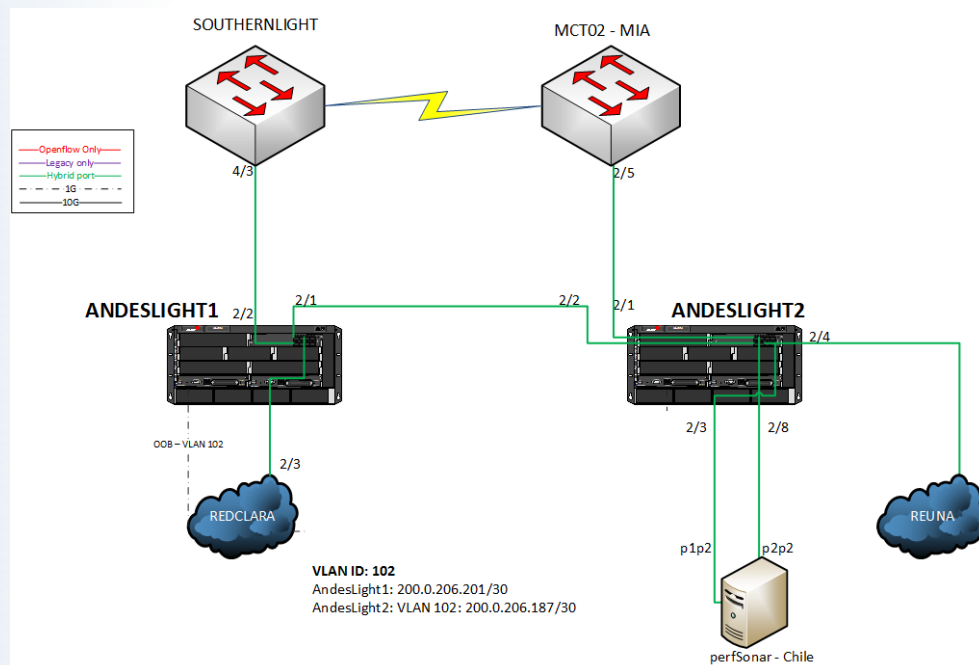
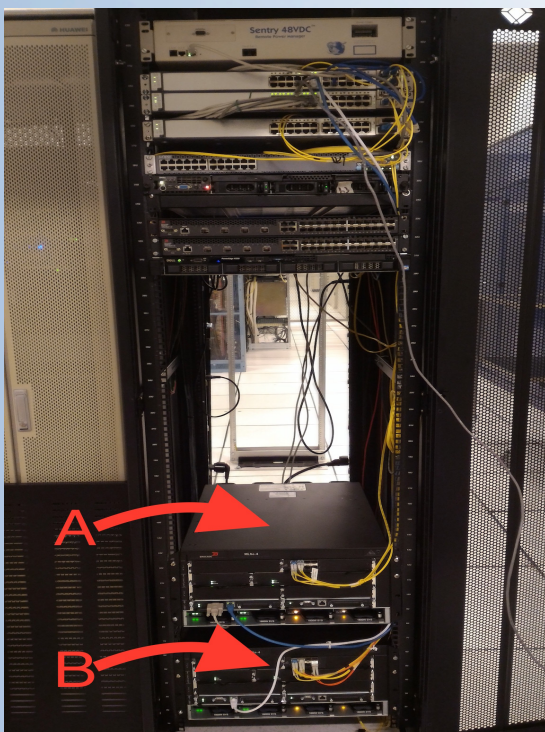


# AmLight network updates

- Two new 10G links have been added to the topology:
  - Sao Paulo x Miami (Atlantic) – November 2015
  - Sao Paulo x Miami (Pacific) – December 2015
- A new 100G ring BR <--> US is being installed (updates in a separated presentation)

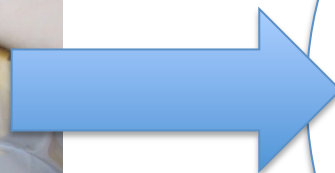
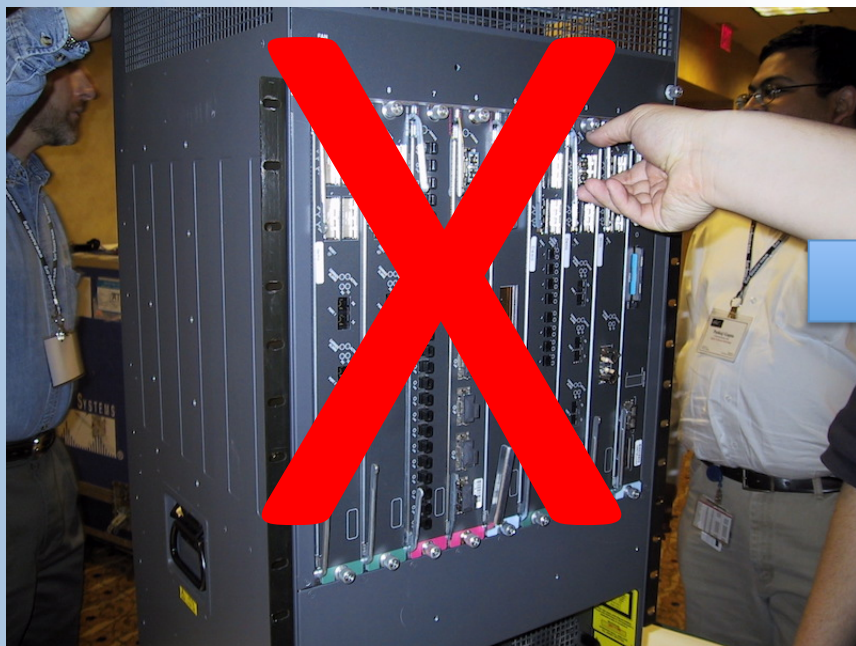
# AmLight network updates [2]

- Improvements in Chile: Two standalone Brocade CES switches were replaced by two Brocade MLXe switches (chassis)
- All AmLight's PoPs have the same hardware



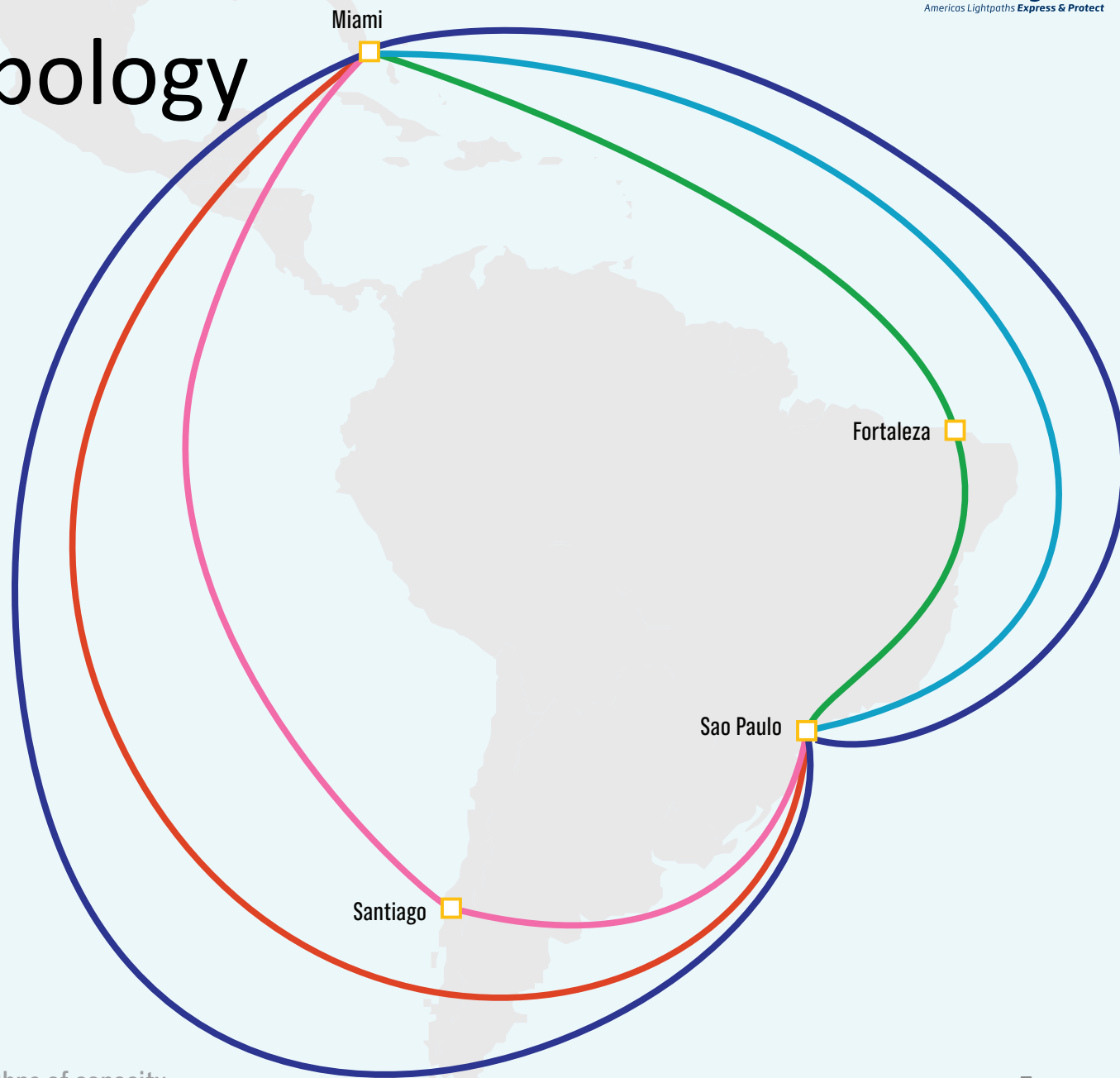
# AmLight network updates [3]

- Improvements at AMPATH: Cisco Academic router was replaced by two Juniper MX480 – A more resilient and scalable environment



**Routing Cluster**

# Current Topology

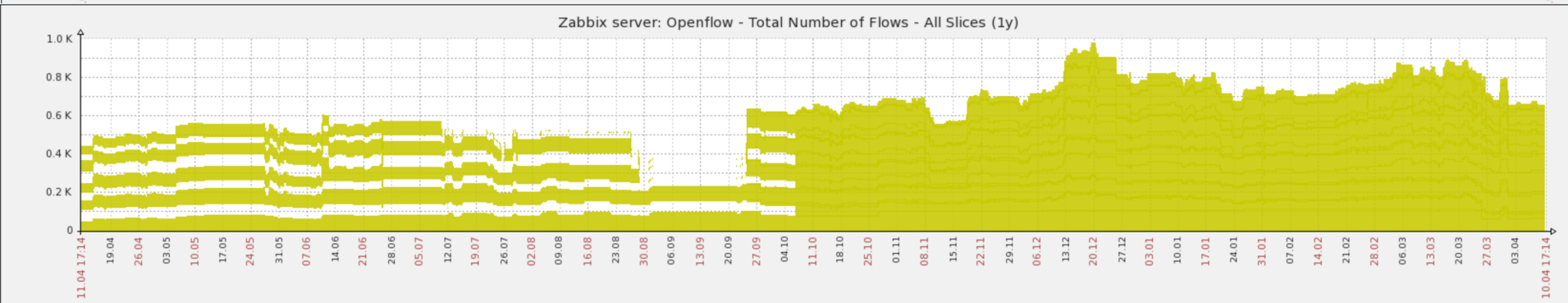
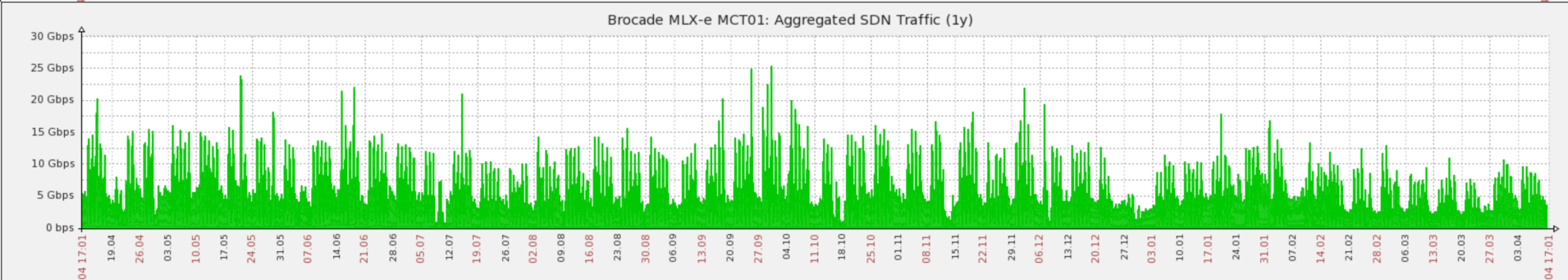
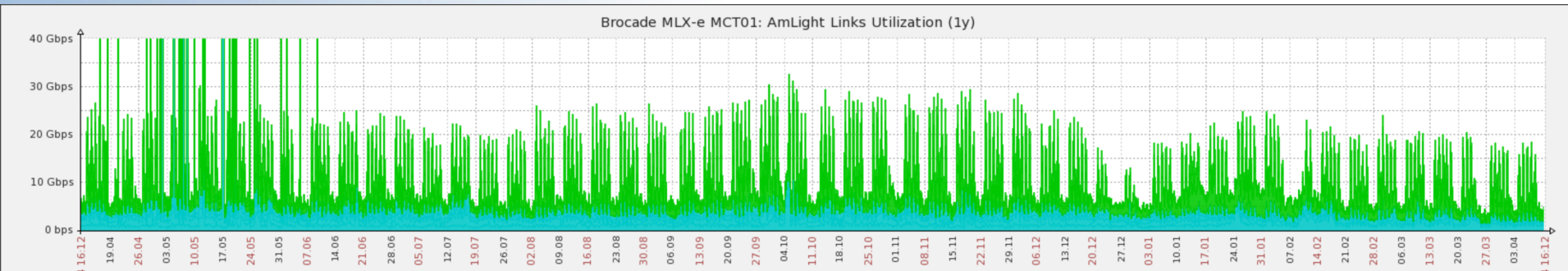


## AMLIGHT LINKS

All links represented in this maps have 10Gbps of capacity

# Utilization of the network by the SAACC community

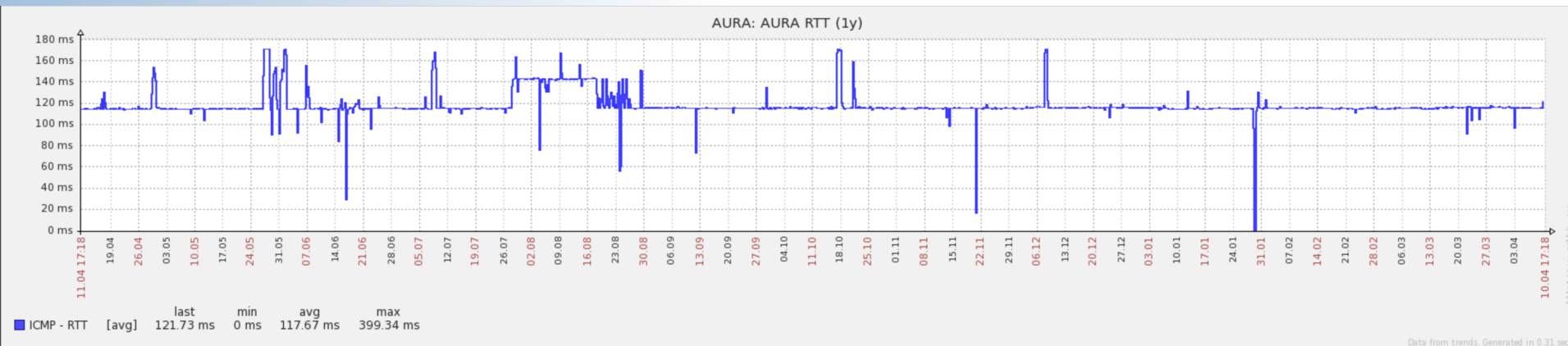
## AmLight links utilization (1 year)





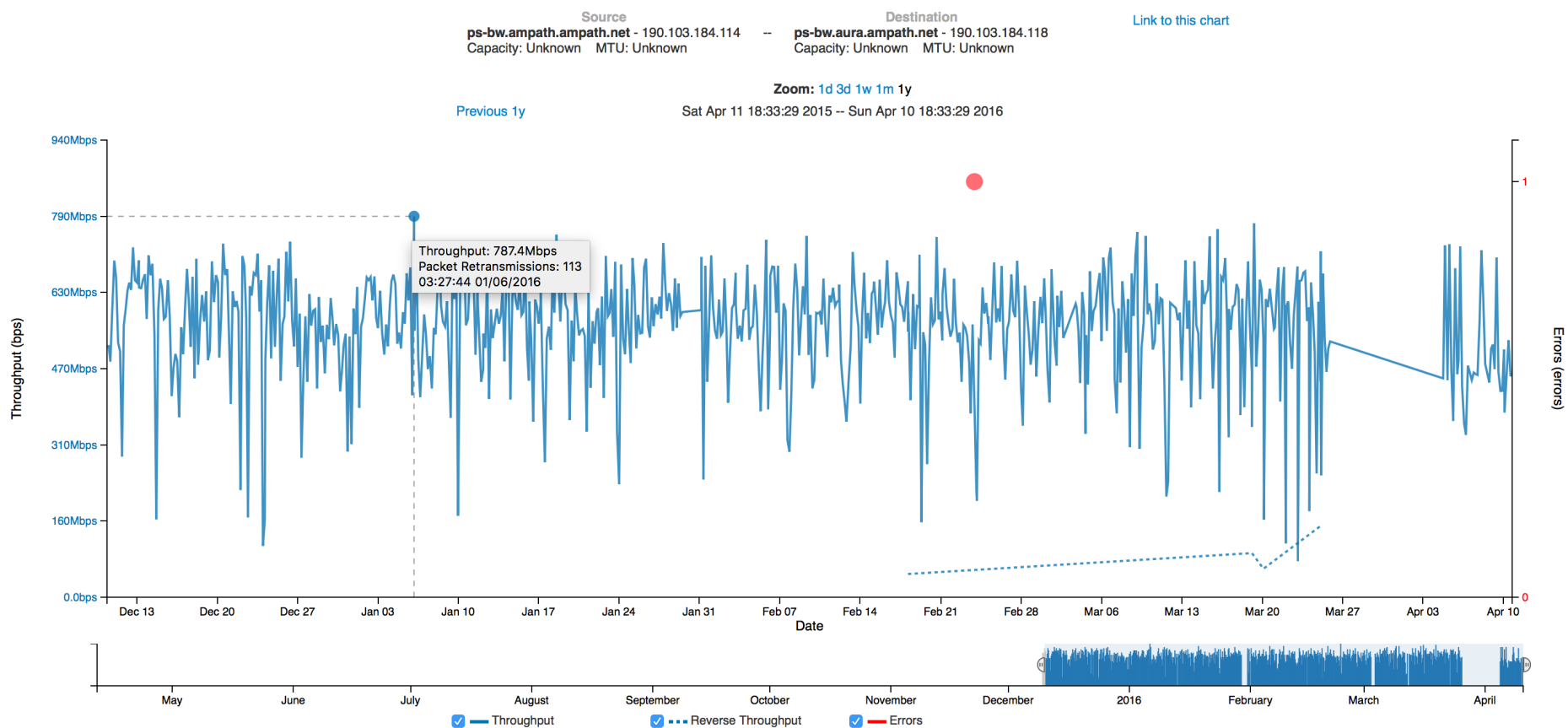
# Utilization of the network by the SAACC community [2]

RTT AMPATH x AURA (1 year):



# Utilization of the network by the SAACC community [3]

## Bandwidth – AMPATH x AURA (1 year):



# Part 2: An update on the LSST End-to-end project.



# LSST end-to-end testing plan

- Phases 1 and 2 general updates:
  - Phase 1: Basic Monitoring
  - Phase 2: Santiago to NCSA, X Mbps Guaranteed Bandwidth
  - All servers follow the pattern:
    - ps-lt.<SITENAME>.lhn.lsst.org – for OWAMP (VLAN 4001)
    - ps-bw.<SITENAME>.lhn.lsst.org – for BWCTL (VLAN 4002)
  - More tunings to the servers TCP/IP stack and the NIC card were applied
    - Improvements seen on the results of bandwidth tests

# LSST end-to-end testing plan [2]



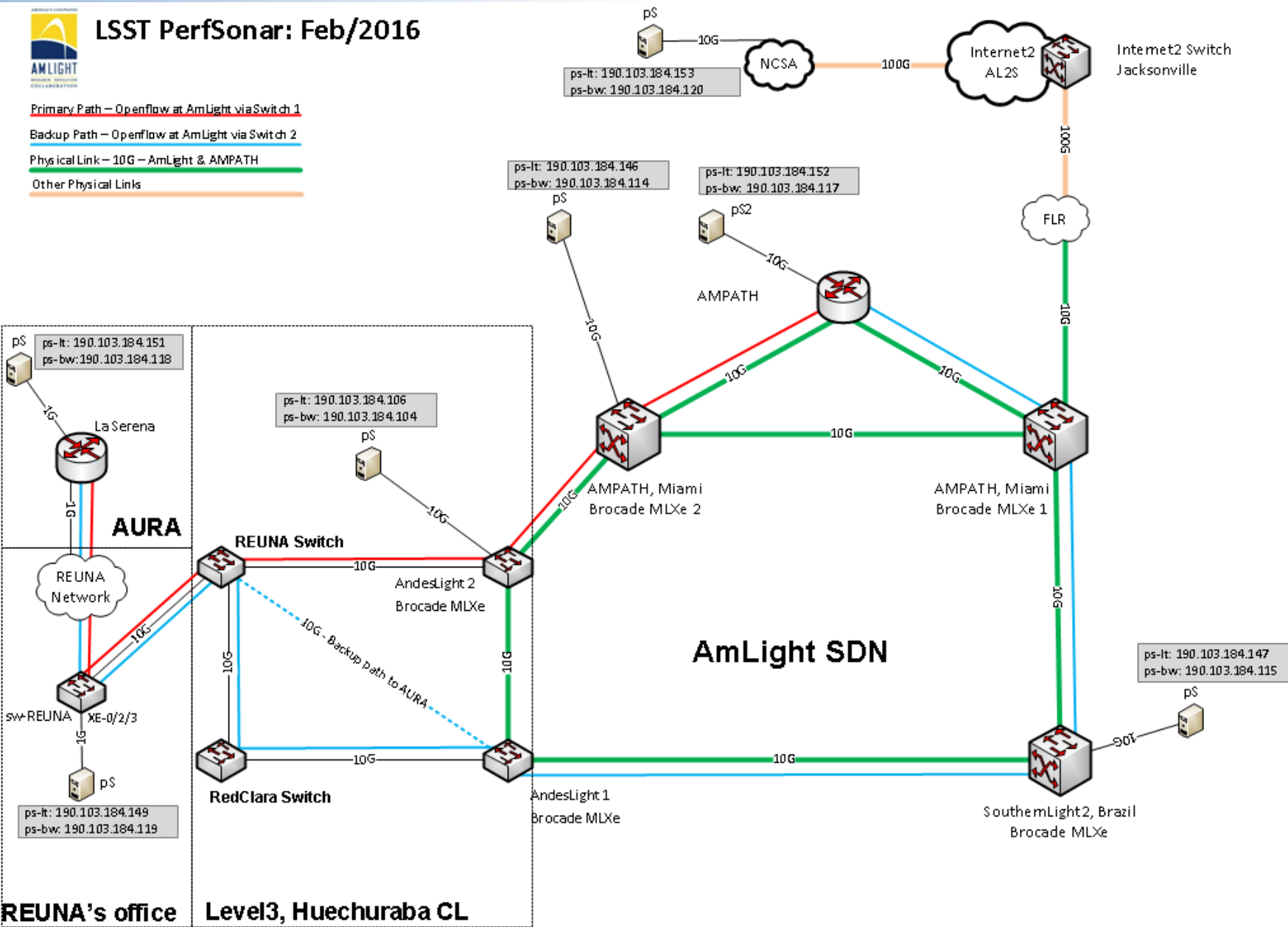
LSST PerfSonar: Feb/2016

Primary Path – Openflow at AmLight via Switch 1

Backup Path – Openflow at AmLight via Switch 2

Physical Link – 10G – AmLight & AMPATH

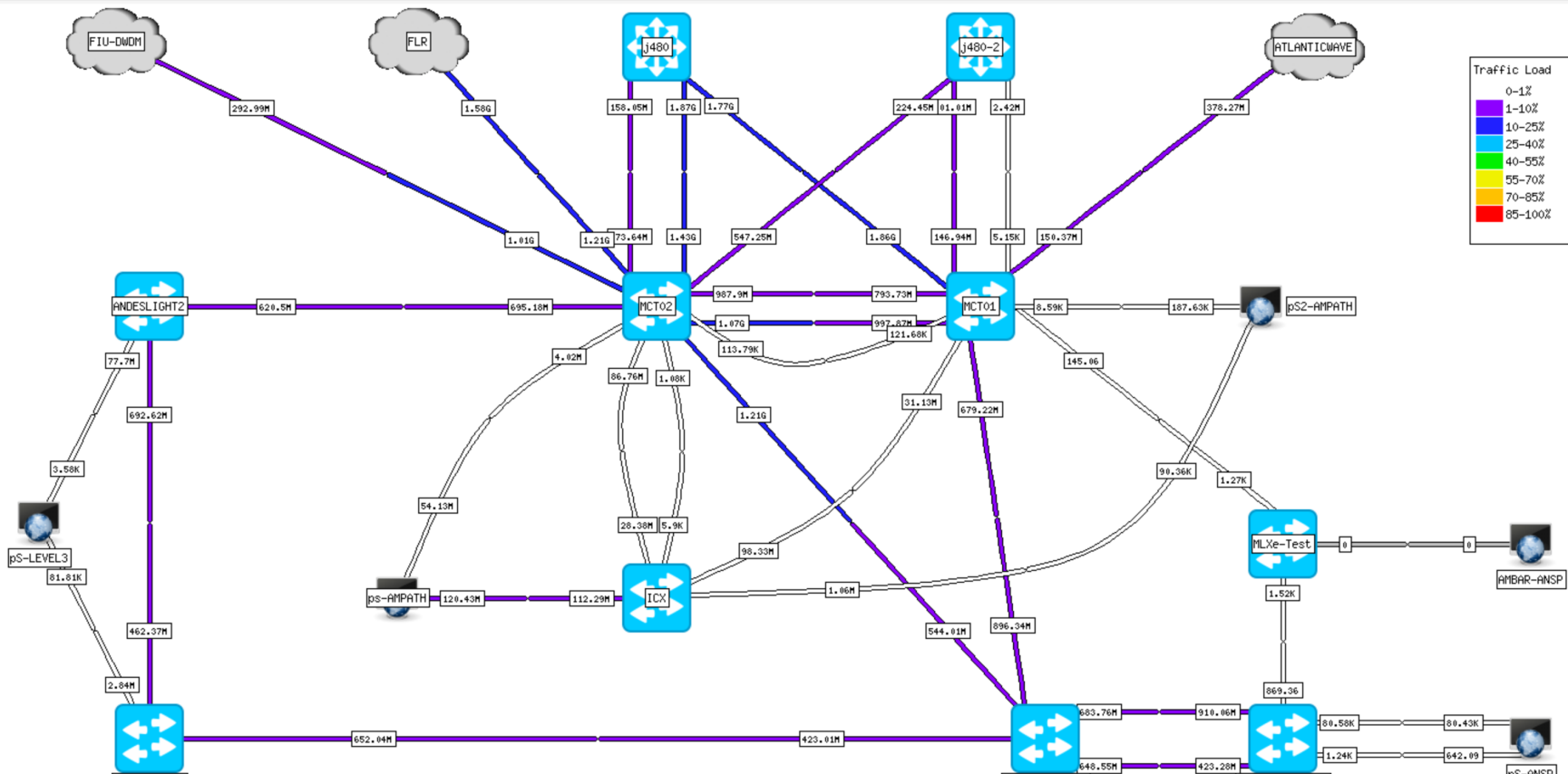
Other Physical Links



# LSST end-to-end testing plan [2]

- PerfSonar live weathermap:
  - <http://ps-livemap.ampath.net>

LSST perfSonar deployment - AmLight



# LSST end-to-end testing plan [3]

- Phases 1 and 2 general updates:
  - VLANs 4001 (OWAMP tests) and 4002 (BWCTL tests) extended to all sites in the path
  - Full-mesh test set to OWAMP and BWCTL using TCP
    - OWAMP: 10 pps, sample 60 seconds (600 packets)
    - BWCTL TCP: every 6h, 25 sec duration, ignore first 5 sec (TCP slow start)
  - UDP tests between Level3-Santiago <-> NCSA, and REUNA <-> NCSA
    - 1G bandwidth, 20 sec duration, test once a day
  - Maddash fully operational
    - <http://ps-dashboard.ampath.net>
    - Checks run every 5 minutes when there is no change in the result from the previous run
    - A result must be seen 3 times before changing the status.

# LSST end-to-end testing plan [4]

## My AmLight: Network Dashboard

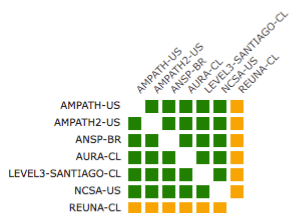
Dashboards Settings External Resources

Last page refresh time: April 11, 2016 09:30:48 AM BRT

### AmLight LSST Dashboard

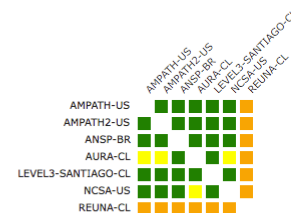
#### AmLight LSST - OWAMP Test Between LSST Latency Hosts

Loss rate is <= 0.01 Loss rate is >= 0.01 Loss rate is >= 0.1 Unable to retrieve data Check has not yet run



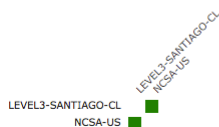
#### AmLight LSST - TCP BWCTL Test Between LSST Bandwidth Hosts

Throughput >= 500Mbps Throughput < 500Mbps Throughput <= 100Mbps Unable to retrieve data Check has not yet run



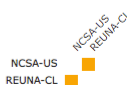
#### AmLight LSST - LSST Phase 2 - UDP 1G Level3-Santiago x NCSA

Throughput >= 500Mbps Throughput < 500Mbps Throughput <= 100Mbps Unable to retrieve data Check has not yet run



#### AmLight LSST - LSST Phase 2 - UDP 1G REUNA-Santiago x NCSA

Throughput >= 500Mbps Throughput < 500Mbps Throughput <= 100Mbps Unable to retrieve data Check has not yet run





# LSST end-to-end testing plan [5]

- Conclusion
  - Phase 1 - concluded
  - Phase 2 – peak 4.9Gbps bandwidth from Santiago to NCSA – without resource reservation

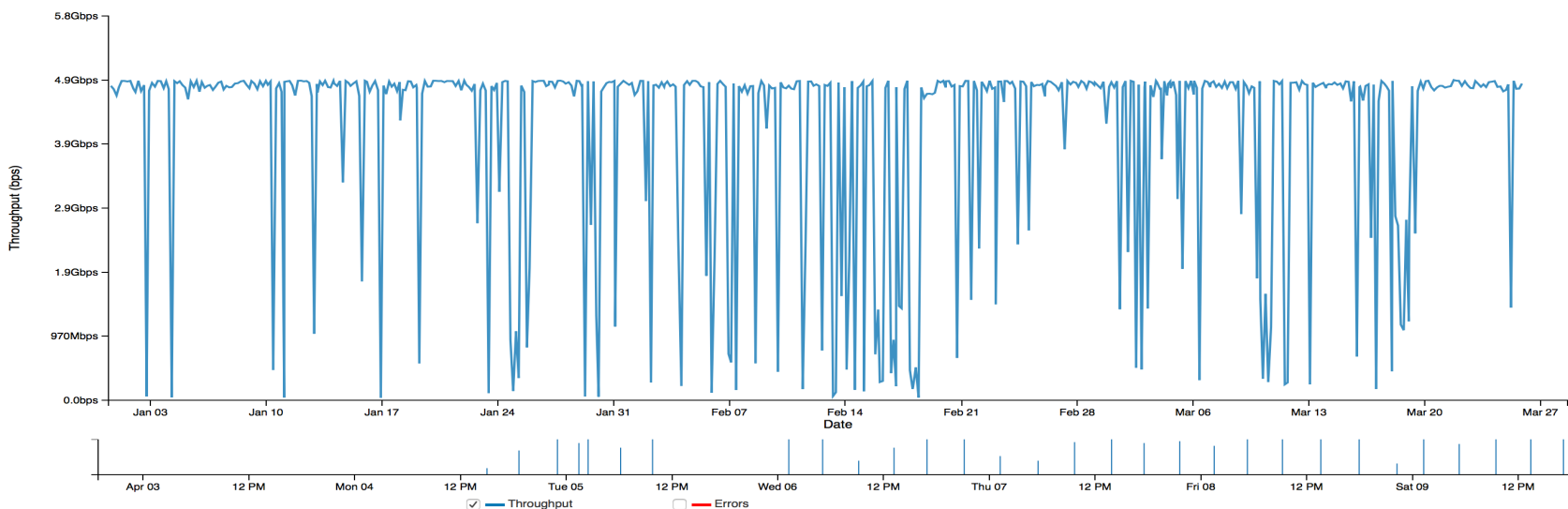
Source: ps-bw.l3-santiago.ampath.net - 190.103.184.116 -- Destination: ps-bw.ncsa.ampath.net - 190.103.184.120  
 Capacity: Unknown MTU: Unknown

Link to this chart

Zoom: 1d 3d 1w 1m 1y

Previous 1y

Fri Apr 10 18:54:15 2015 -- Sat Apr 9 18:54:15 2016



# LSST end-to-end testing plan [6]

- Next steps:
  - Start the monitoring plan - LSST Operations and Management Plan
    - All spans in the physical path between La Serena and Champagne should be fully documented and monitored
  - Start Phase: 3 - Santiago to NCSA, 1Gbps Guaranteed Bandwidth
    - Needed: Support for QoS and bandwidth reservation in all network operators, including AmLight:
      - Currently, AmLight is in process of adopting an OpenFlow solution to address this requirement. Solution expected for the end of the year



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