LSST Networks

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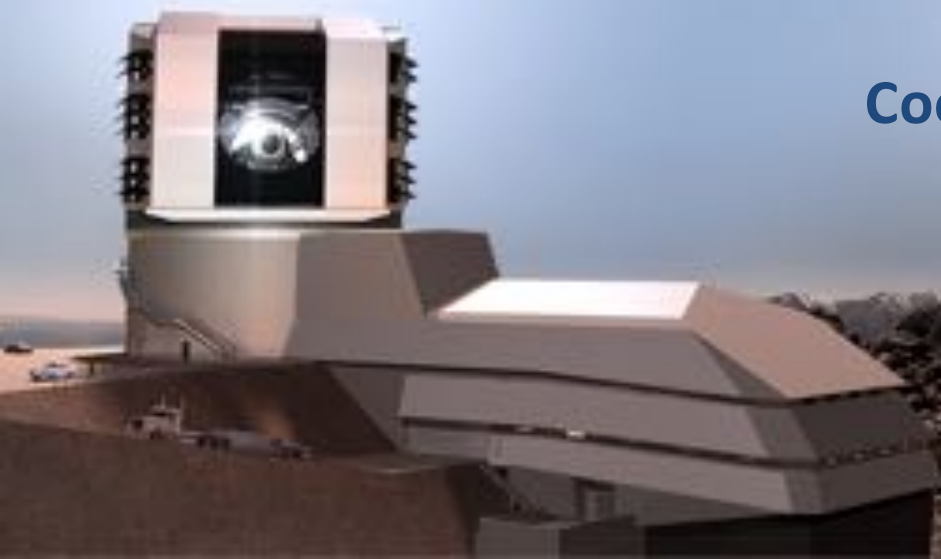
South American Astronomy
Coordination Committee Meeting
May 18, 2018



Networks and Path Diversity between Sites and Centers

HQ Site
HQ Facility
Observatory Management
Science Operations
Education and Public Outreach

AURA

LSST Corporation

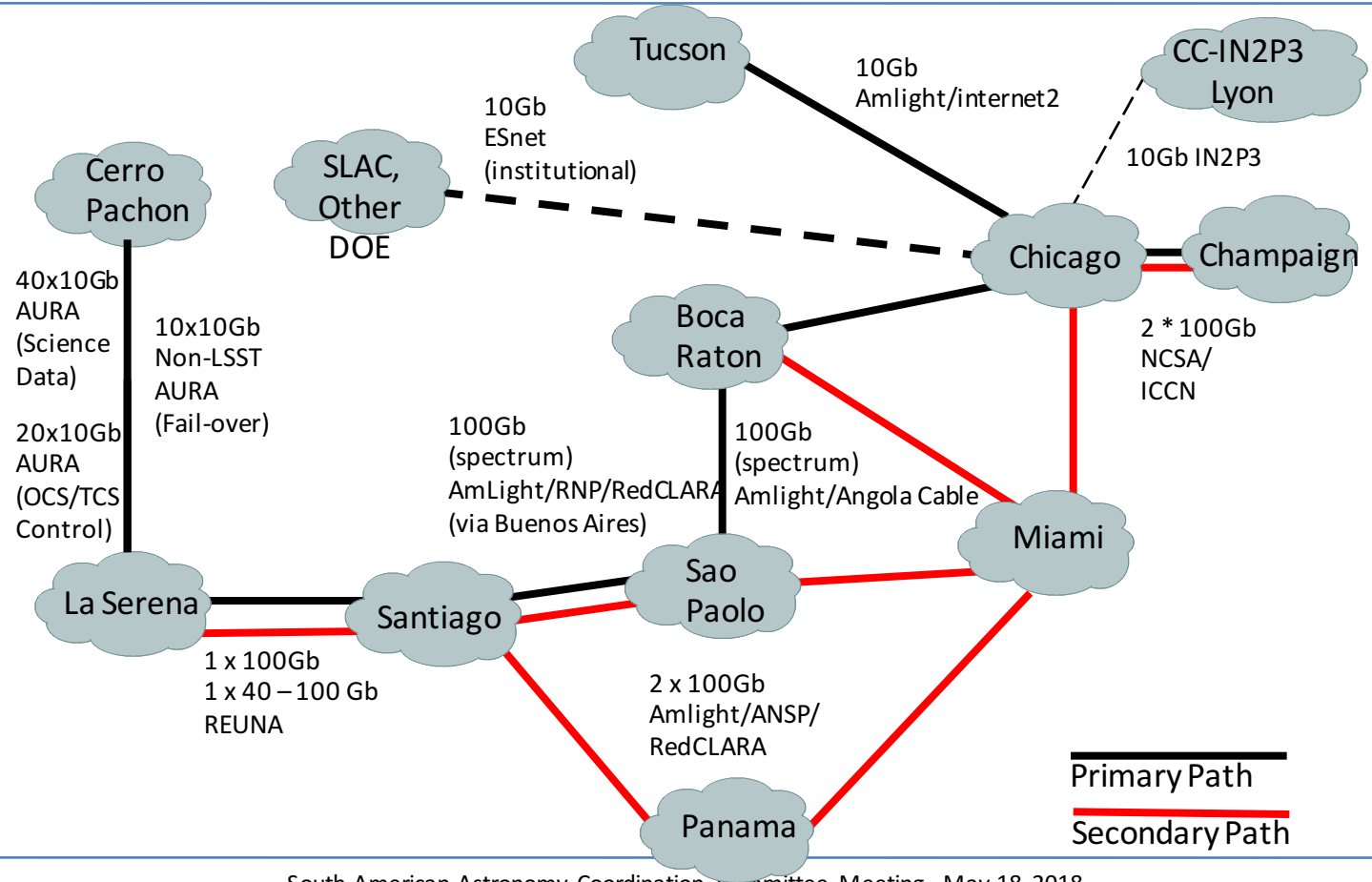
Archive Site
Archive Center
Alert Production
Data Release Production
Calibration Products Production
EPO Infrastructure
Long-term Storage (copy 2)
Data Access Center
Data Access and User Services

French Site
Satellite Processing Center
Data Release Production

Summit Site
Summit Facility
Telescope and Camera
Data Acquisition
Crosstalk Correction

Base Site
Base Center
Long-term storage (copy 1)
Data Access Center
Data Access and User Services

LSST Long Haul Network Links (Baseline)



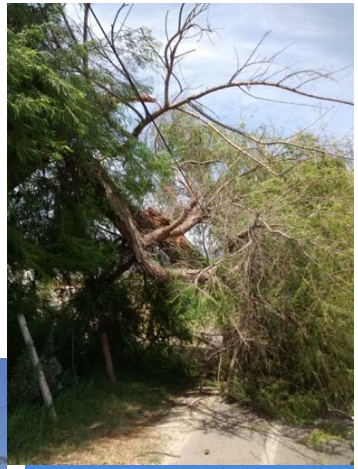
Recent Accomplishments

- Accepted fibers
  - Summit – AURA Gatehouse
  - AURA Gatehouse – La Serena
  - La Serena - Santiago
- Installed Dense Wave Division Multiplex (DWDM) equipment on Cerro Pachon, in La Serena, and in Santiago
- Conducted First Optic Light Demonstration
- Activated 100 Gbps Ring Santiago – Miami

Work in Progress

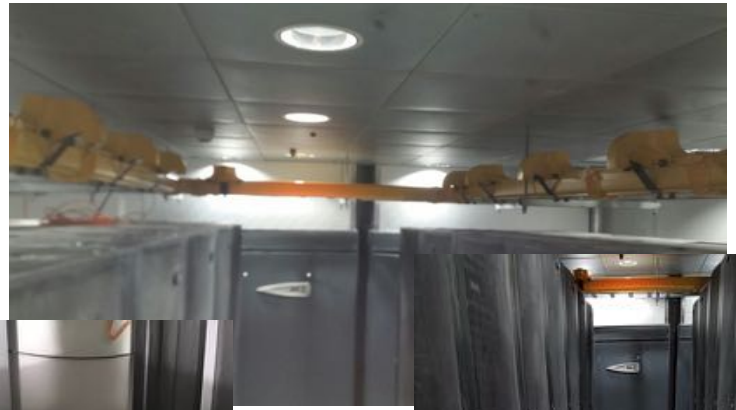
- Installation of Cisco ACI-based Summit Network
- DWDM procurement for 100 Gbps Spectrum/activate link
- Design of Base Data Center in La Serena
- Agreement with Esnet to provide 2 x 100 Gbps links Atlanta - Chicago

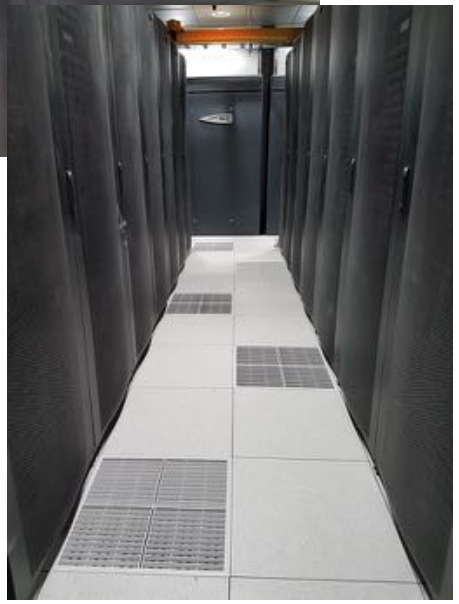
Accepted Fiber Optics



Installed DWDM Equipment

Summit Computer Room





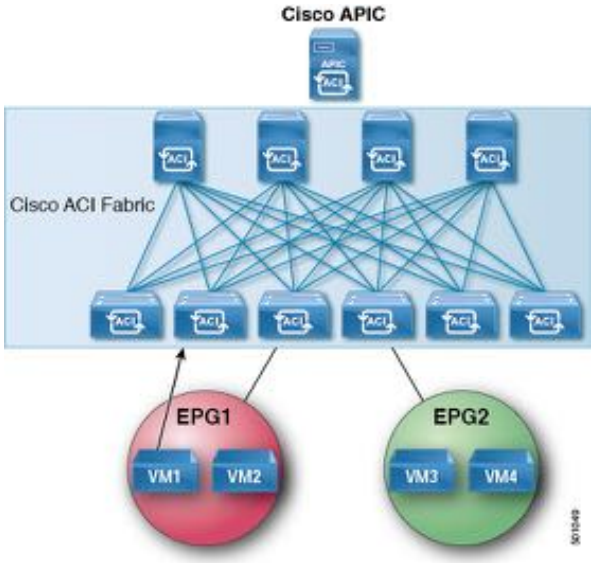
Summit Network: Cisco ACI

What's Cisco ACI?

- State-of-the-art software define network (SDN) solution.
- Centralizes management (controller).
- Automates the underlying network.

Why Cisco ACI?

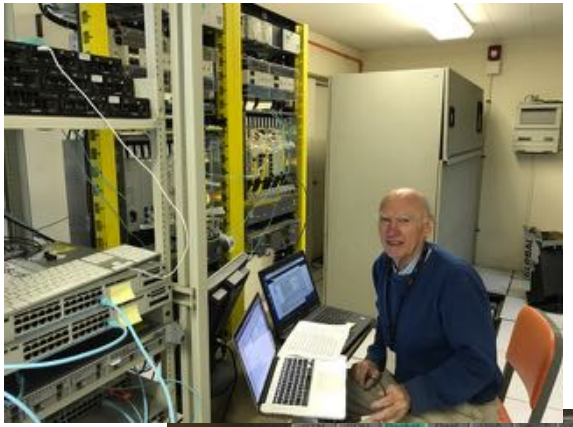
- Penalty-free 100G L2 adjacency.
- Embedded security.
- Increased visibility and support for Container (Docker) and Virtual Machine (Vmware) networking.
- Sorts-out DDS middleware challenges:
  - ✓ Routes multicast between different networks and different physical switches without additional multicast routers.

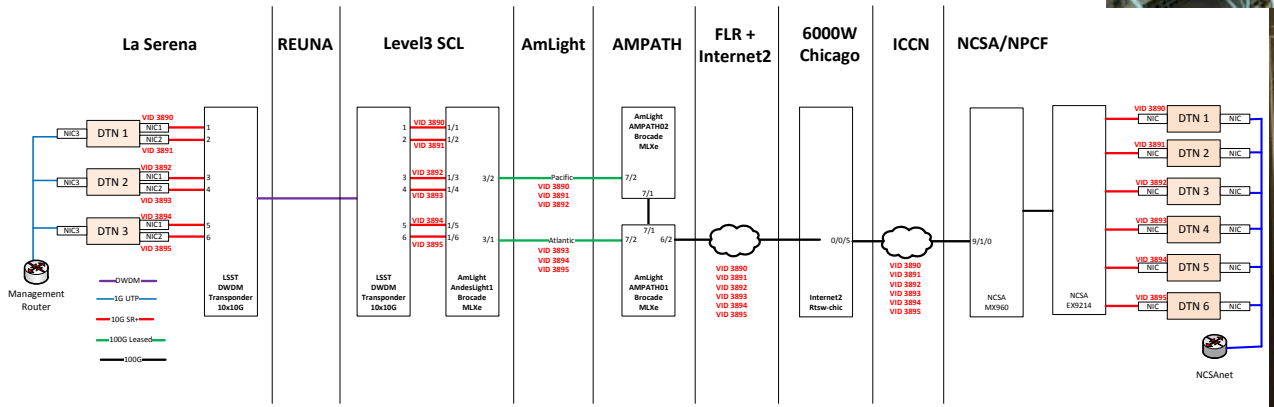


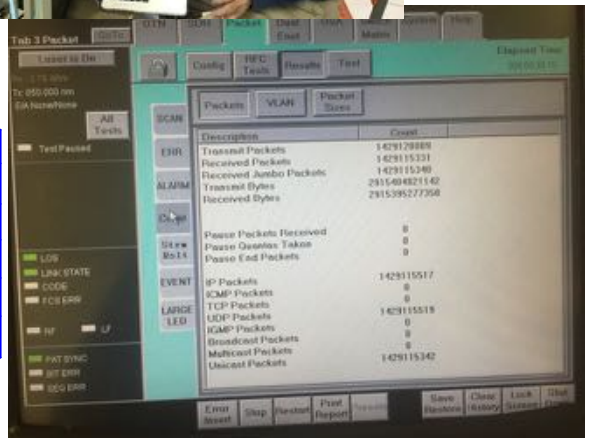
Summit Network Installation

First Optic Light Demonstration

- The LSST Network Engineering Team (NET) completed the first successful transfer of digital data over LSST/AURA fiber optic networks from the Summit Site on Cerro Pachon, Chile to the Base Site in La Serena, Chile and on to the Archive Site at NCSA in Champaign. A set of 6 x 10 Gbps Network Interface cards on Data Transfer Nodes (DTN) configured with iPerf3 generated a sustained data rate of approximately 44 gigabits per second, over a period of 24 hours. This exceeded the test target of 40 gigabits per second.







CY18 remaining Major Activities/Milestones

- Initial Summit Network
- Summit Computer Room server installations (Aux Tel, EFD, ECS, etc.)
- Base LAN Design Complete (also Cisco ACI)
- LSE-239 Base Data Center Requirements updated/rebaselined
- 100 Gbps test between Chile and NCSA
- Activation of Spectrum Link (Sao Paolo – Boca Raton)
- Completion of ESNet Agreement