The Gemini Observatory Mission

"To advance our knowledge of the Universe by providing the International Gemini community with forefront access to the entire sky"

Gemini Observatory
" One Observatory, Two Telescopes"

Gemini Telescopes

- Gemini North
  - Mauna Kea Mountain, Hawaii

- Gemini South
  - Cerro Pachon,Chile

Gemini Partners

- United States
- Canada
- Chile
- Brazil
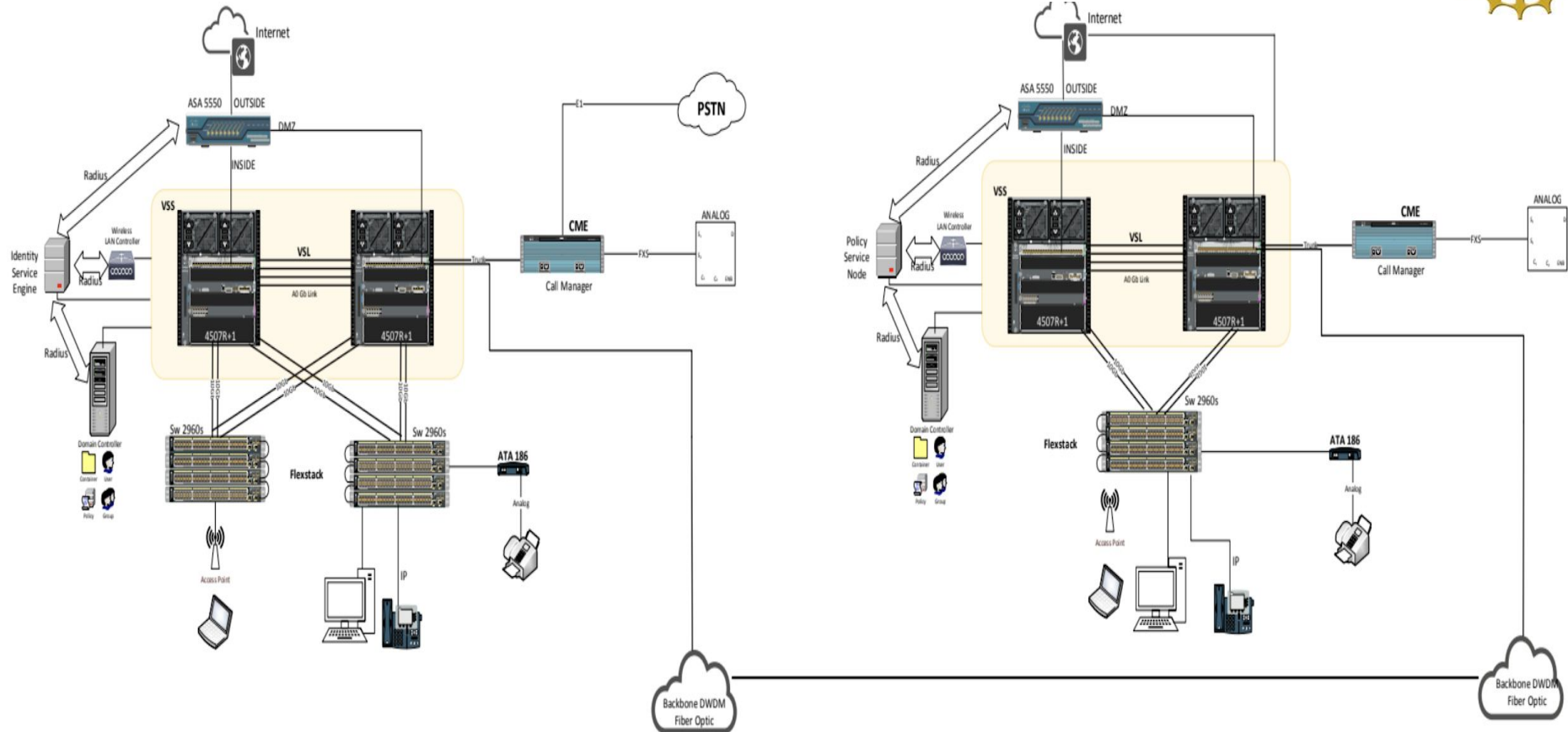- Argentina
- Korea

Gemini Observatory Data Centers

Gemini North

- Hilo Base Facility (HBF) , Hilo City
- Mauna Kea Operations (MKO), at 4200m

Gemini South

- La Serena Base Facility (SBF), La Serena
- Cerro Pachon Operation (CPO), at 2700m

High level Diagram

Key Use Cases:

- #1 = Base Facility Operations: High QoS

- #2 = Summit Base Data Transfer: High Bandwidth

- #3 = High Availability: Multiple Paths

- #4 = Cross-site Coordination, Hilo - La Serena: Low Latency

- #5 = Cloud Data Archiving: High Reliability

Gemini Network Use

- Remote Observing
  - Base Facility Operations

Gemini South staff Javier Fuentes and Joy Chavez conduct remote observations from the control room in La Serena, Chile.

- Instrumentation
  - Each Telescope is equipped with four instruments fed by advanced AO Systems:
    - GMOS
    - GSAOI
    - GPI
    - FLAMINGOS-2
    - GEMS
    - GCAL
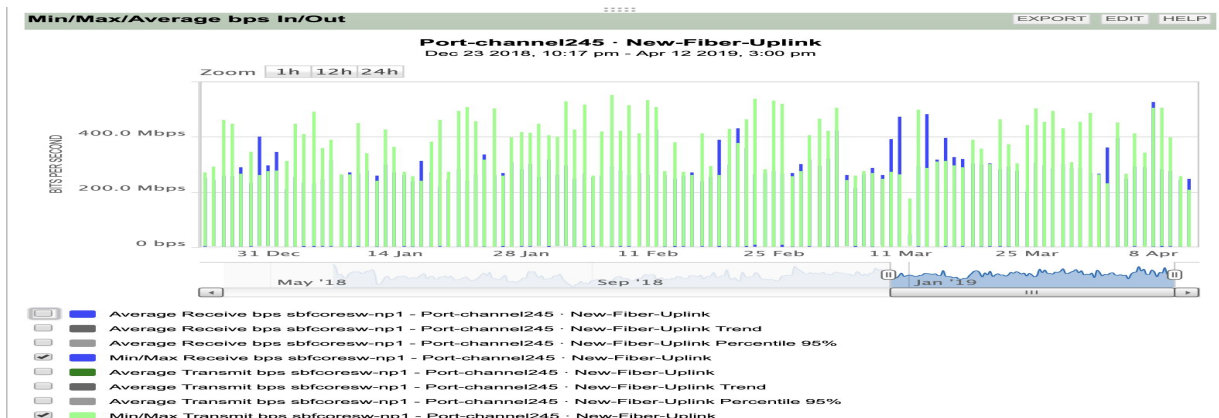 - Visiting Instruments
    - DSSI
    - Phoenix
    - IGRINS

Summit Base Data Transfer

Primary Channel

- Current : SM Fiber DWDM,20 Gb/s : Port-Channel 2x10Gb/s
- Future: Upgrade: 40 Gb/s

Backup link

- Gemini/Telconor Link : 300 Mb/s (2 Microwave radios)

Multiple Paths: HA

Data Center Redundancy:

- Core Switches
- Authentication Servers
- Virtualization nodes
- Storage servers
- Power and Cooling Systems

Fiber Optic

- Port-Channel

Microwave Link

- Two Radios 150 Mb/s
  - Gemini/Telconor

Cross Site Coordination

VPN L2L between :

- SBF and HBF
- SBF and MKO
- CPO and HBF
- CPO and MKO

Low Latency ~220 ms

La Serena <=> Hilo

Many Services in common:

- Mail and Google Apps
- ISE
- Active Directory
- DNS
- Zoom Conference

Cloud Data Archiving

- Fast and low cost Observatory data archive running on the cloud

- https://archive.gemini.edu/

Next Important upgrades 2019

- Upgrade to the Next Generation Firewalls
    - Migrating from old EoL equipment in 4 locations
    - Increase BW to the AURA Border router
    - Improvement using High availability
    - New features incorporated :
        - New IPS
        - AMP
        - URL Filtering

Gemini and NCOA

Gemini IT is planning to leverage the benefits that NCOA can provide, to deliver efficient and effective IT throughout the organization.

- Knowledge transfer across Programs
- Increased support capacity
- Economies of scale
- Standardization of infrastructure

Thanks