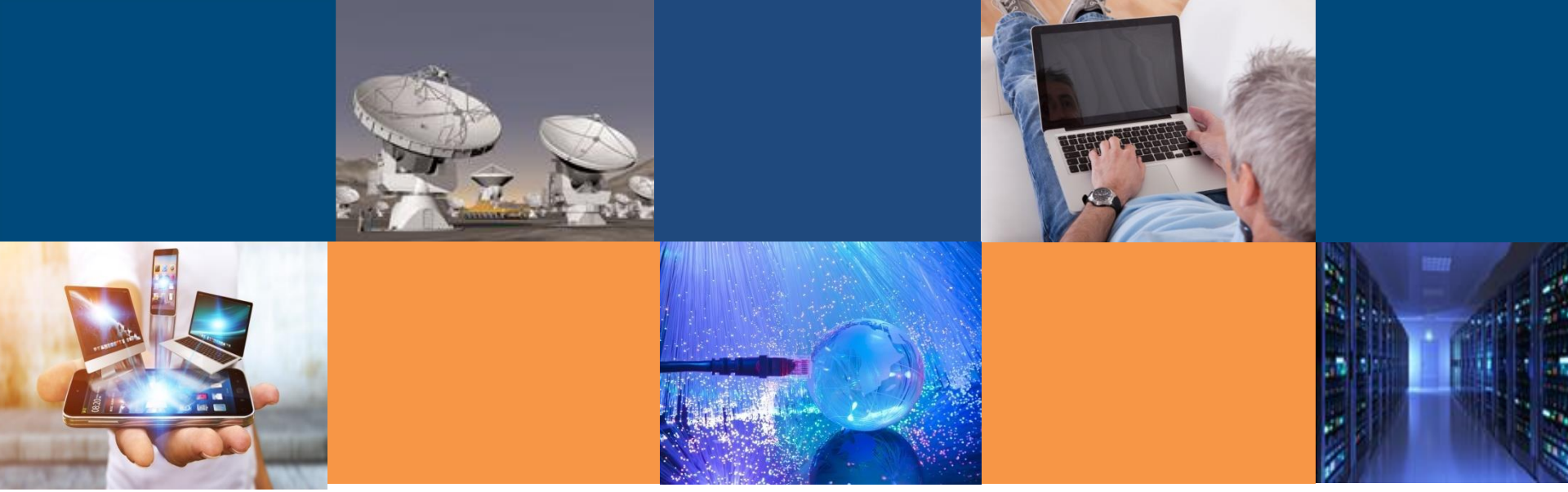
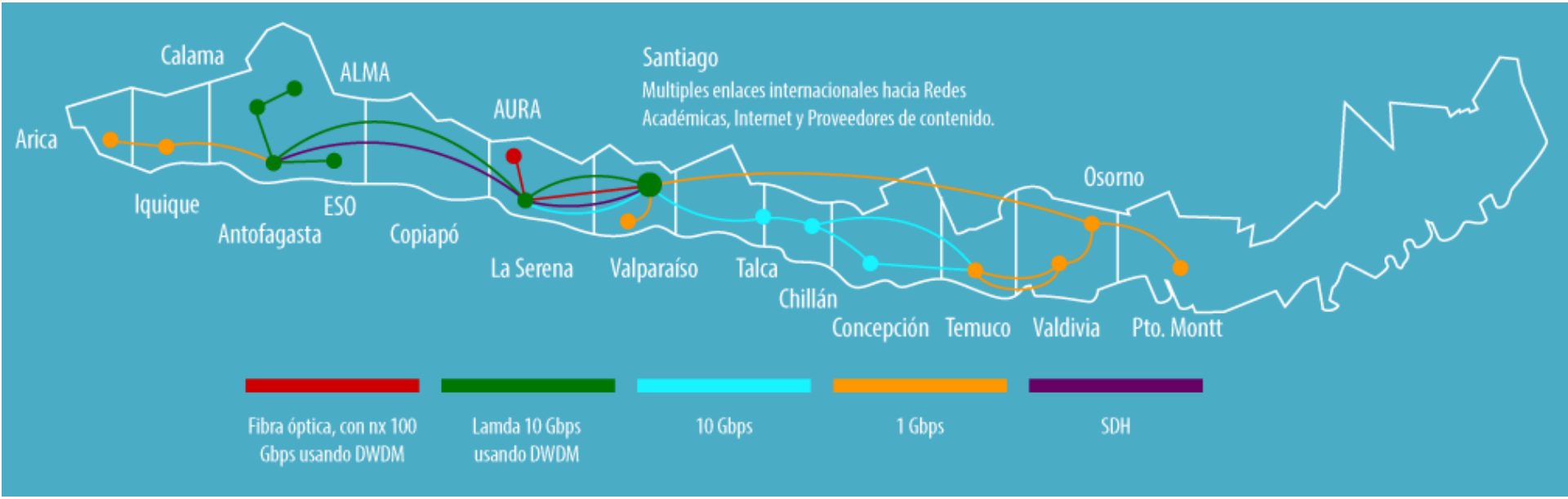


REUNA
Ciencia y Educación en Red

REUNA, the network partner for the astronomy facilities in Chile

Current status of the backbone



April/19th Launching of 1st 100G DWDM optical path: La Serena - Santiago

LATERCERA

Este jueves se inauguró primer tramo de 800 km, que une Coquimbo con Santiago.

emol. NOTICIAS ECONOMÍA DEPORTES ESPECTÁCULOS TENDENCIAS AUTOS SERVICIOS FOTOS EMOL TV 360

Inicio › Noticias › Se inaugura moderna red de fibra óptica para seguir potenciando el desarrollo de la astronomía en Chile

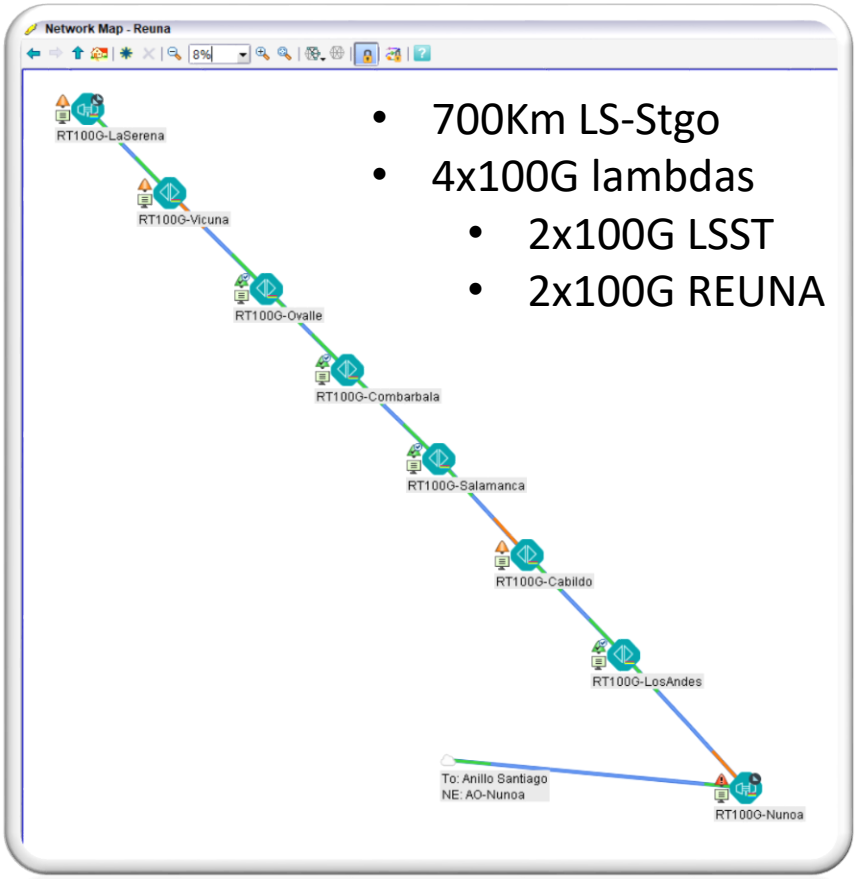
Se inaugura moderna red de fibra óptica para seguir potenciando el desarrollo de la astronomía en Chile

20 de Abril de 2018 Compartir 0 0 0

http://www.reuna.cl/2018/04/28/reuna-estrena-nuevo-video-corporativo/

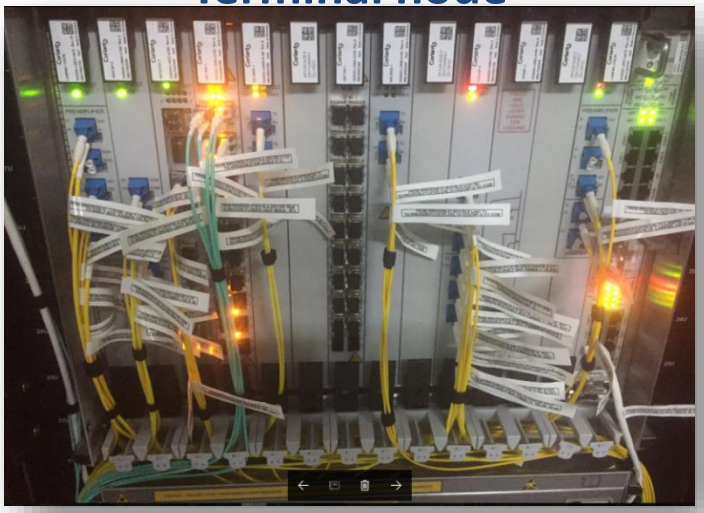
REUNA Ciencia y Educación en Red

La Serena – Santiago inside



- 700Km LS-Stgo
- 4x100G lambdas
  - 2x100G LSST
  - 2x100G REUNA

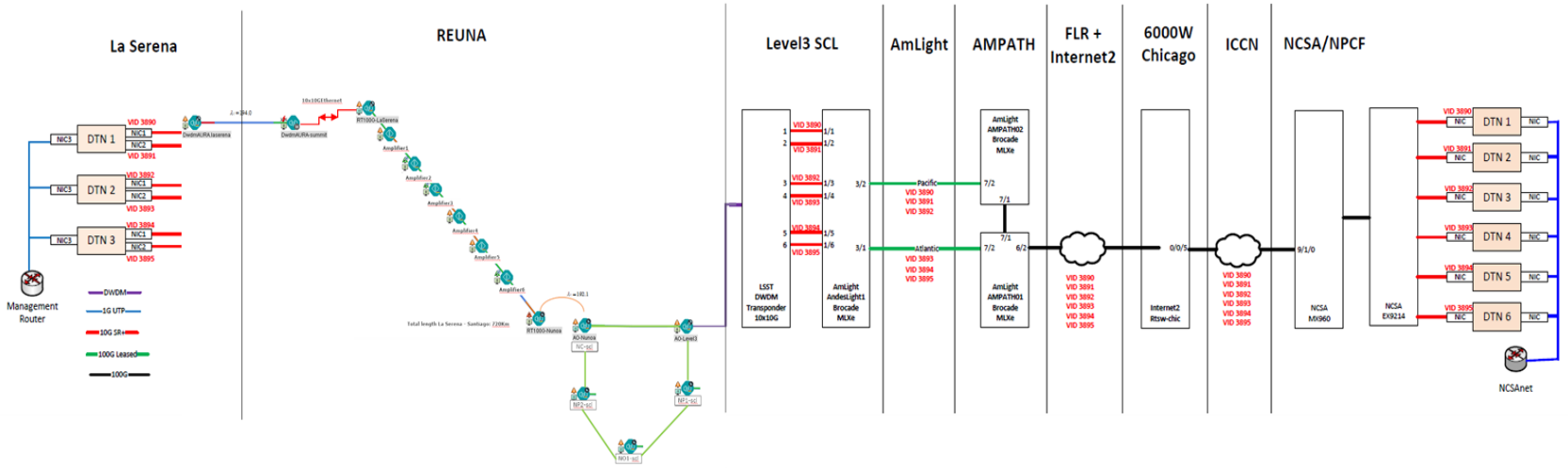
Terminal node



Amplifier node

State	Name	Start Site	End Site	Format	OS Frequency [THz]	Actual OSNR [dB]	Length [km]
Valid	23600 OCH La Serena Santiago	Santiago	La Serena	OTU4	191.50000	20,50	697,46
Valid	23600 OCH La Serena Santiago _R	La Serena	Santiago	OTU4	191.50000	20,14	697,46
Valid	53128 OCH La Serena Santiago _R	Santiago	La Serena	OTU4	192.10000	20,46	697,46
Valid	53128 OCH La Serena Santiago	La Serena	Santiago	OTU4	192.10000	20,19	697,46
Valid	37040 OCH La Serena Santiago _R	Santiago	La Serena	OTU4	193.00000	20,04	697,46
Valid	37040 OCH La Serena Santiago	La Serena	Santiago	OTU4	193.00000	19,89	697,46
Valid	69304 OCH La Serena Santiago	Santiago	La Serena	OTU4	194.30000	19,16	697,46
Valid	69304 OCH La Serena Santiago _R	La Serena	Santiago	OTU4	194.30000	19,21	697,46

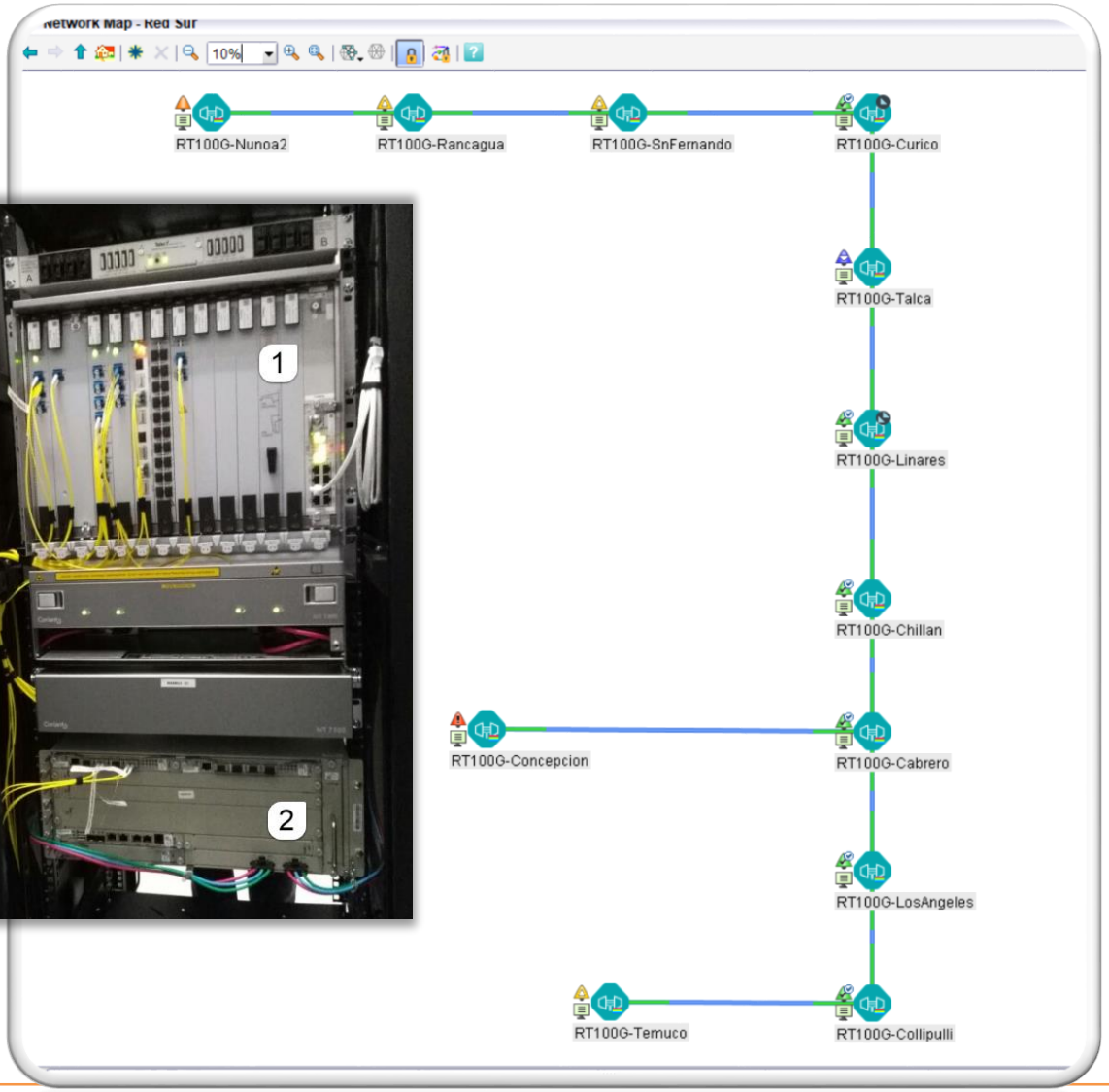
Lighting up the LSST Fiber Optic Network: From Summit to Base to Archive



- Transfer data from Pachon/LSST to NCSA Illinois USA.
  - A set of 6 x 10 Gbps network interface cards in data transfer nodes (DTN) using iPerf3 software generated a sustained data rate of 48Gbps for 24-hour period. This exceeded the test objective of 40 gigabits per second.

https://project.lsst.org/lighting-lsst-fiber-optic-network-summit-base-archive

Santiago – Concepcion - Temuco



- 800Km fiber
- In partnership with a Telco Company
- Technical challenge
- 13 add&drop nodes
- Will use two DWDM solution
  - CORIANT
  - PADTEC (lambda alien)
- Status:
- All the equipment installed
- This week is being doing the last step the equalization of the lambdas
- Benefit:
- One 10G dedicated cannel for each Institution in REUNA along the path

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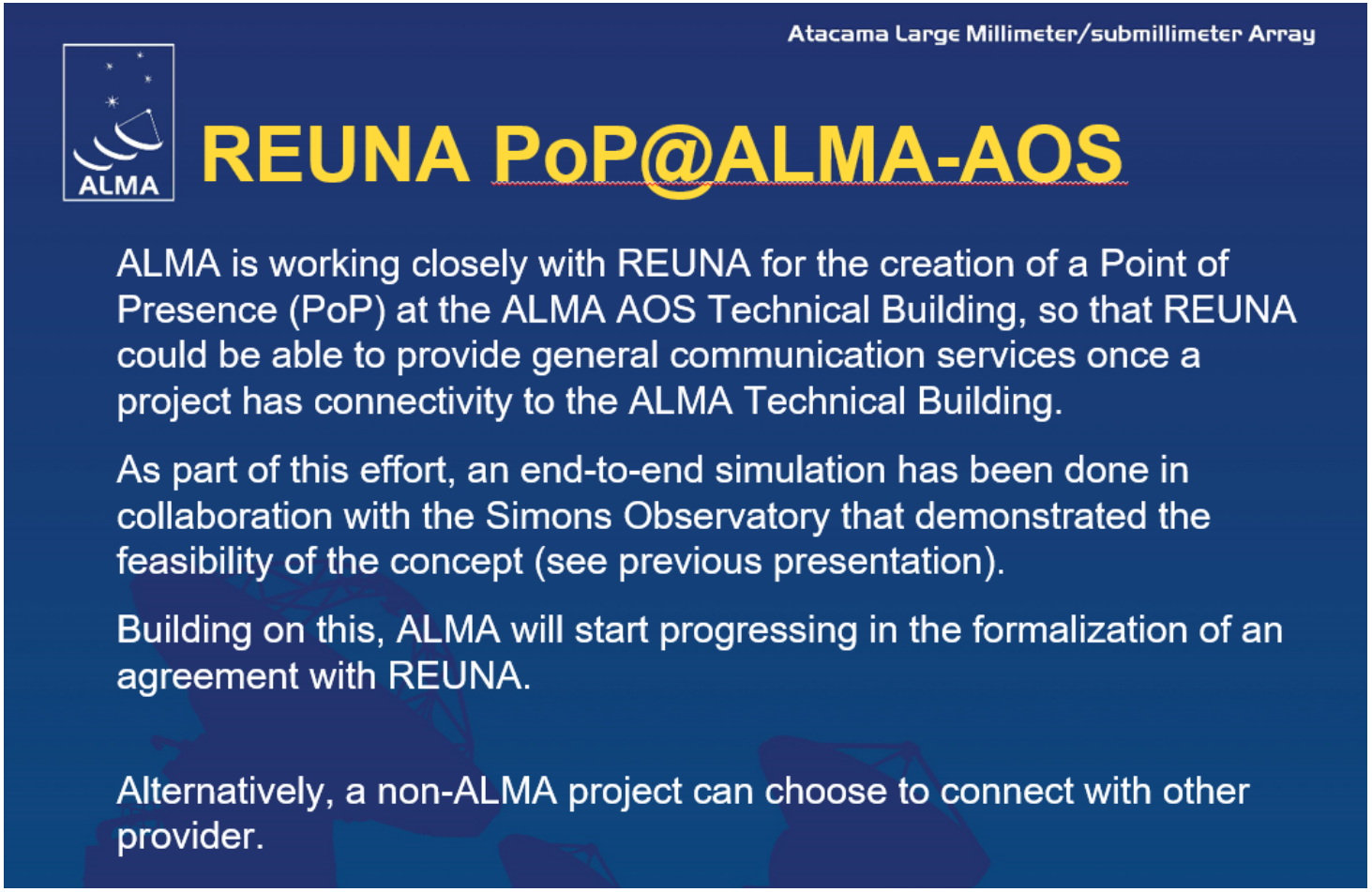
A Pilot communication test in collaboration with Simons Observatory and ALMA REUNA's PoP in Chajnantor demo

Chajnantor Working Group meeting 9-10/May/2018 OSF ALMA facilities



Source: Jorge Ibsen, presentation CWG 2018

The goal of the experiment

To simulate a connection PoP at AOS to bring connectivity to others Observatory using part of the existing network infrastructure

Network infrastructure

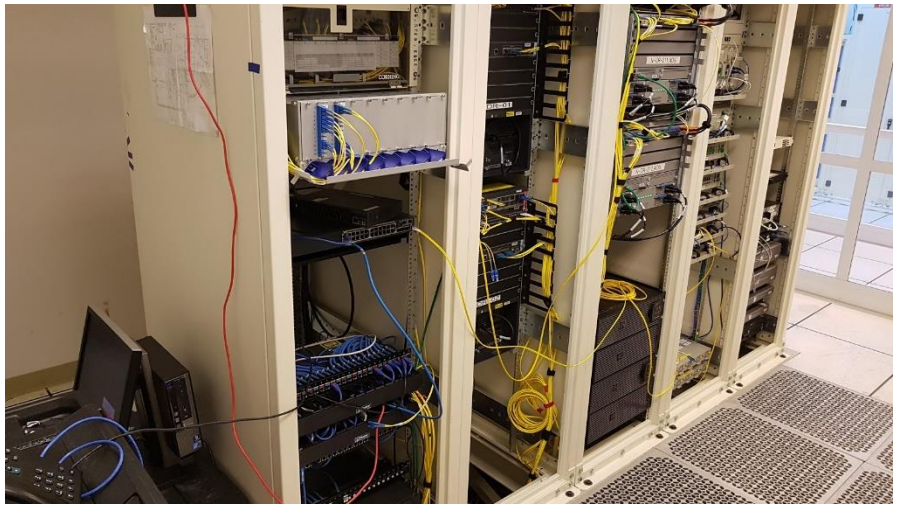
- AOS – Calama: Fiber, transporting 1x10Gbps today
- Calama – Antofagasta: 10Gbps
- Antofagasta-La Serena: 10Gbps
- La Serena – Santiago: 2x10Gbps*

Use of the 10G Antofagasta – Santiago:
2G ESO, 4G REUNA & RedCLARA, 2G ALMA

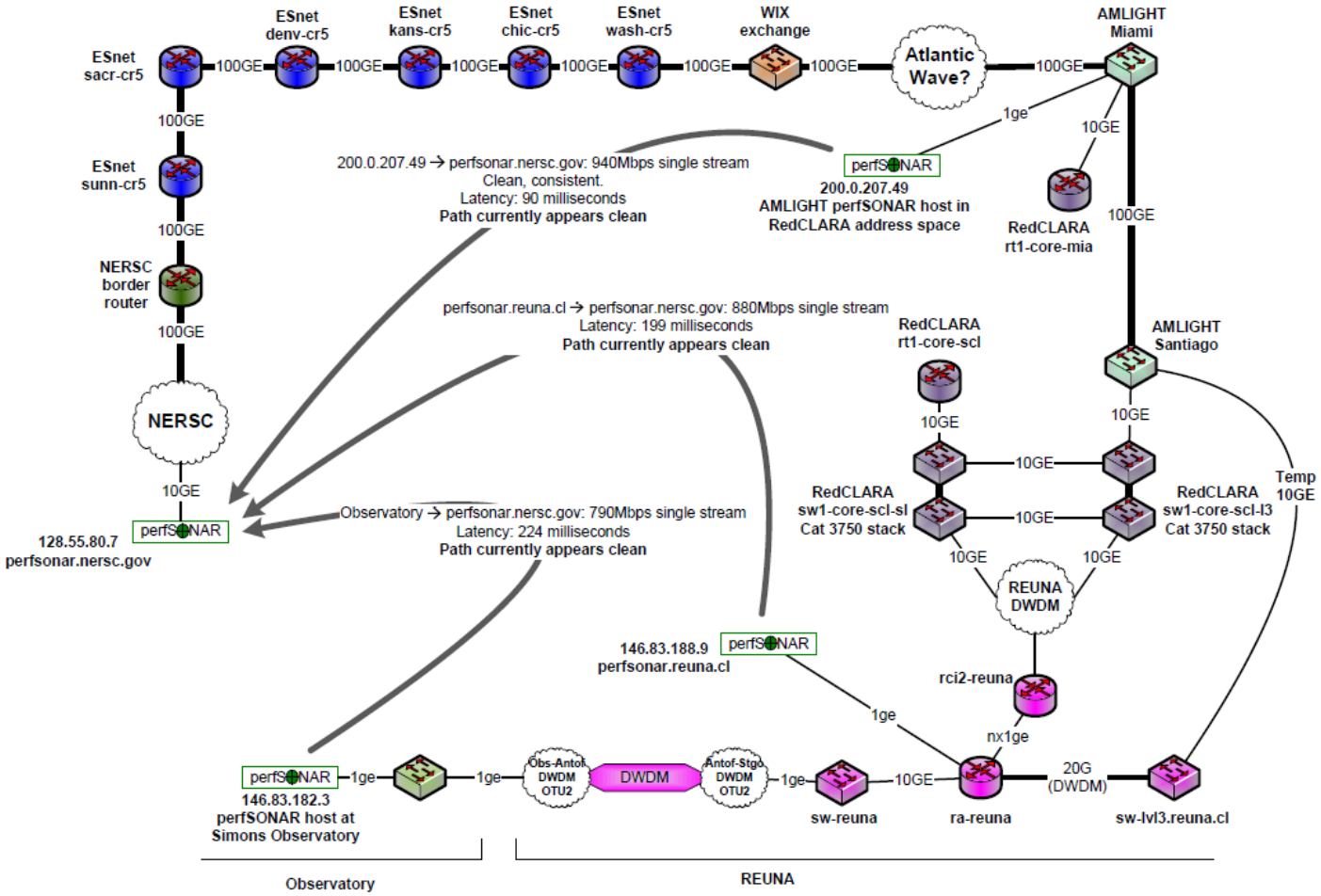
The resources used for the experiment

- Temporary Access provided by ALMA:
  - PC with LINUX and a Cisco Switch
  - AOS – Calama: 1Gbps over 1x10G on fiber
  - Calama – Antofagasta: 1Gbps over 1x10G
- Temporary Access provided by REUNA:
  - Antofagasta-La Serena: 1Gbps over 1x10G
  - La Serena – Santiago: 1Gbps over 2x10G
  - Santiago-Miami: 1G best effort over 10G (*)
  - Miami-NERSC: Best effort over Internet2 + ESNET 100G network (*)
  - Public IPv4/24 network segment

(*) Temporary access in collaboration with RedCLARA, ESNET



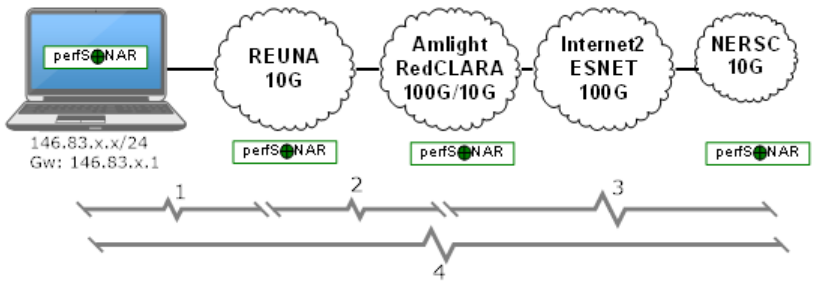
The full topology of the experiment



Thanks to Eli Dart from ESNET for prepare the map and join all the topology information

Some results

Work in Progress



#	Source	Destination	Bw (Mbps)	latency
1	AOS/Simons	REUNA Santiago	900 - 900	24,5
2	REUNA Santiago	RedCLARA Miami	300 - 250	107
3	RedCLARA Miami	NERSC California	900 - 900	n/a
4	AOS/Simons	NERSC California	400 - 90	196
4	AOS/Simons	NERSC California	600/500	n/a

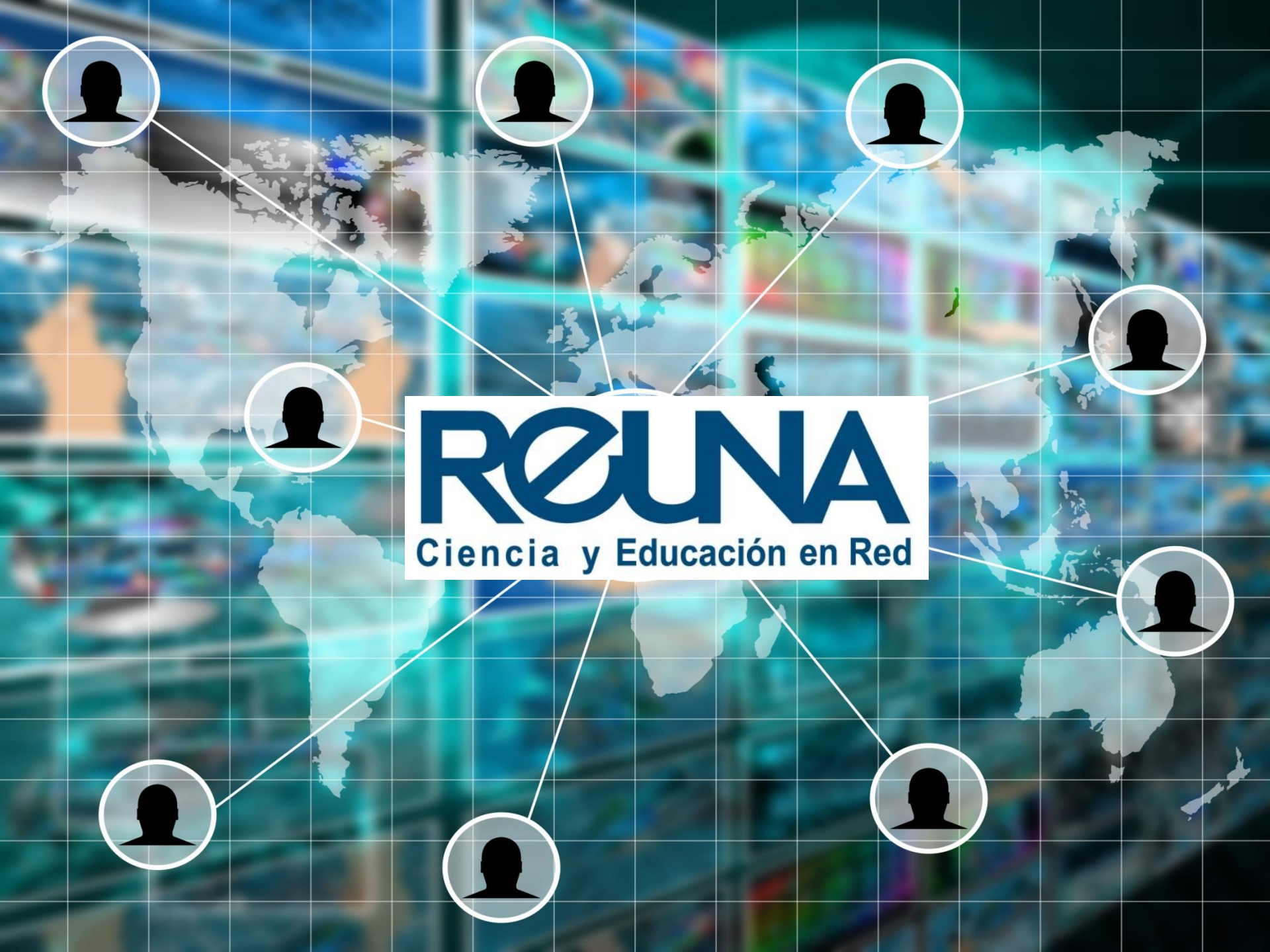
*: Preliminary results

After isolated a switch with problems in Level3

- Successful implementation: 1Gbps transport from AOS to Santiago with full connectivity services
- Bandwidth: full link capacity from AOS to Santiago (1Gbps), international range in the order of 600Mbps
- Very good example of “networking” collaboration (Simons Obs, ALMA, REUNA, RedCLARA, Amlight, ESNET,)

The future

- 2018:
  - La Serena – Temuco: 100G DWDM network
- 2019
  - La Serena – Antofagasta
  - Antofagasta – Calama
  - Calama – Arica
- 2020
  - Temuco – Puerto Montt
- 2021
  - Potential integration with FOA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