



ROUNA

Ciencia y Educación en Red

E-infrastructure for the research and education in Chile SAACC April-2015

National Photonic network for science and education

P1: Long haul Optical path Santiago – La Serena (LSST)

P2: Network upgrade from Santiago to south

P3: "Fibra Óptica Austral" project

P4: BELLA initiative (synergy with the network in the north of the country)

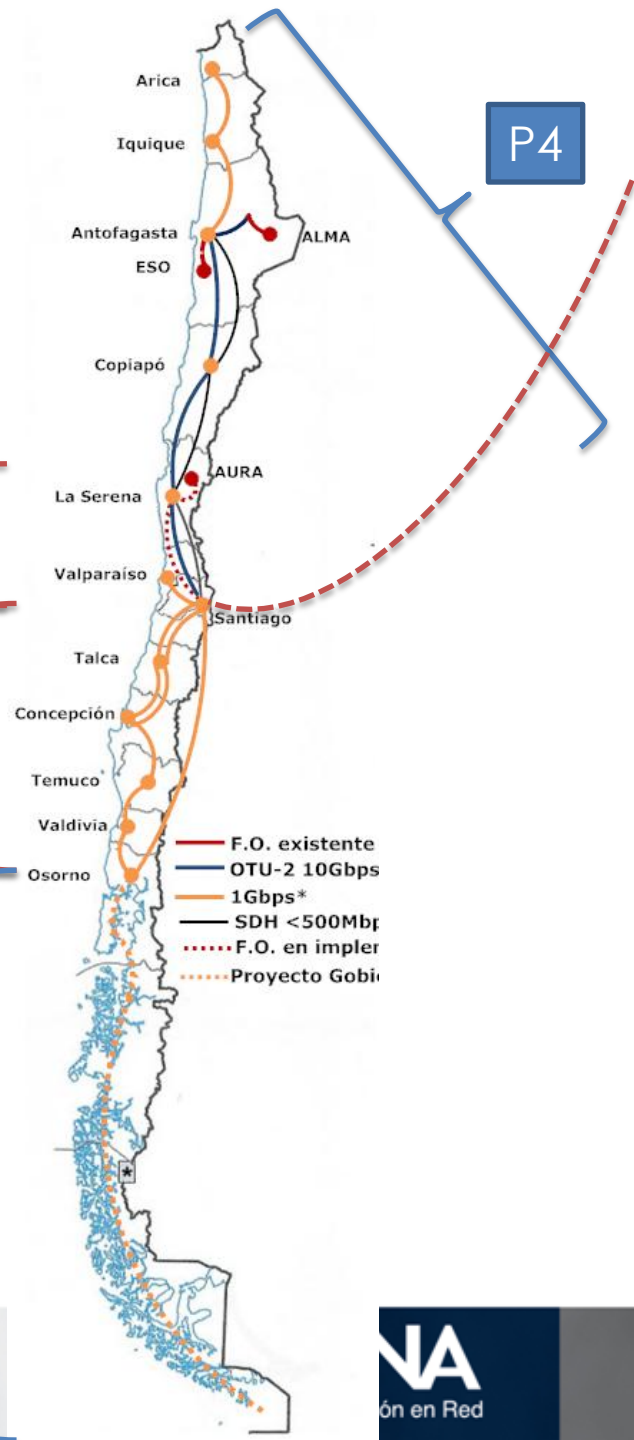
P5

P1

P2

P3

P4



Long haul Optical path Santiago – La Serena (LSST)

P1: “Deployment of the long haul Optical path Santiago – La Serena (LSST)”



Key points

- In line with strategic goal of the REUNA infrastructure
- Partnership with AURA – LSST
- Deployment of 800 km of fiber, will be lighted with DWDM technology

Two main stages:

- Deployment: 2015-2019, 5 years
- Operation: 2020-2034, 15 years



Report: Preliminary Design 1st deliverable – March '15

SubP1: Santiago - La Serena

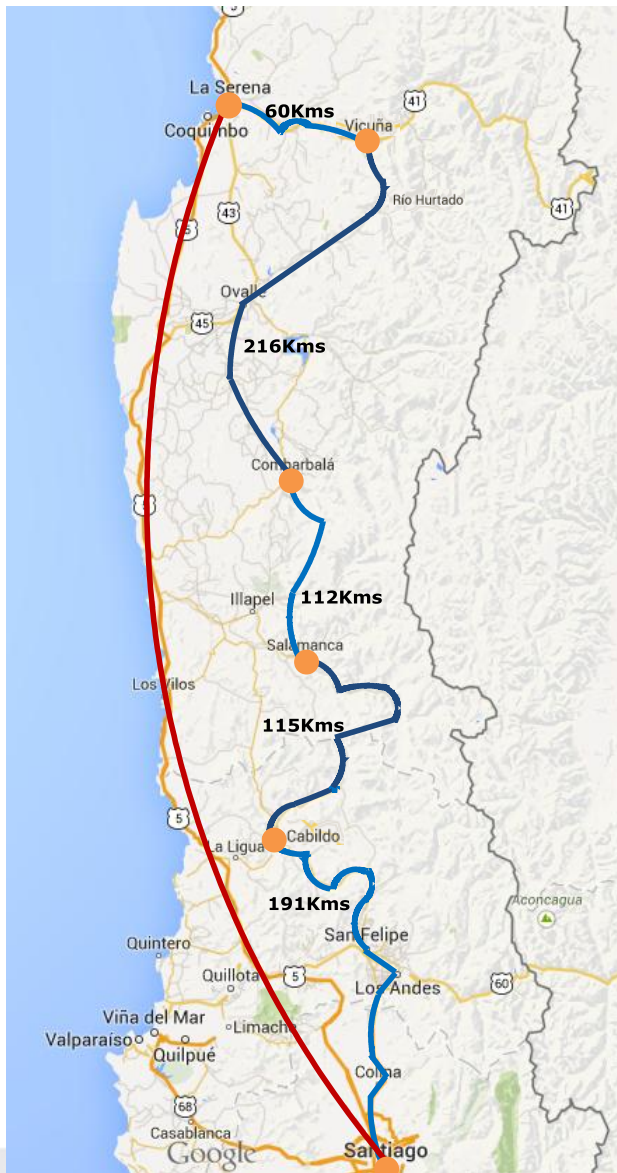
Technical description

1. Fiber (primary path):

- Filaments:2
- Type: G.652
- Attenuation: 0,25 dB/Km a 1550nm.
- Length : 700Kms +/- 5%
- La Serena: AURA office Colina el Pino
- Santiago: Santiago downtown (REUNA already has fiber to there)
- Path: Divided in five segments
- Housing: Six nodes (For amplifiers, NO Raman)
- Date: Telefonica ready Nov-2015, follows 6 month of testing period to validate fiber parameters.

2. Lambda (backup path):

- Diversity path (different from the main path)
- First stage OTU-2 (4Gbps guaranteed for LSST)
- Date: In operation January 2016

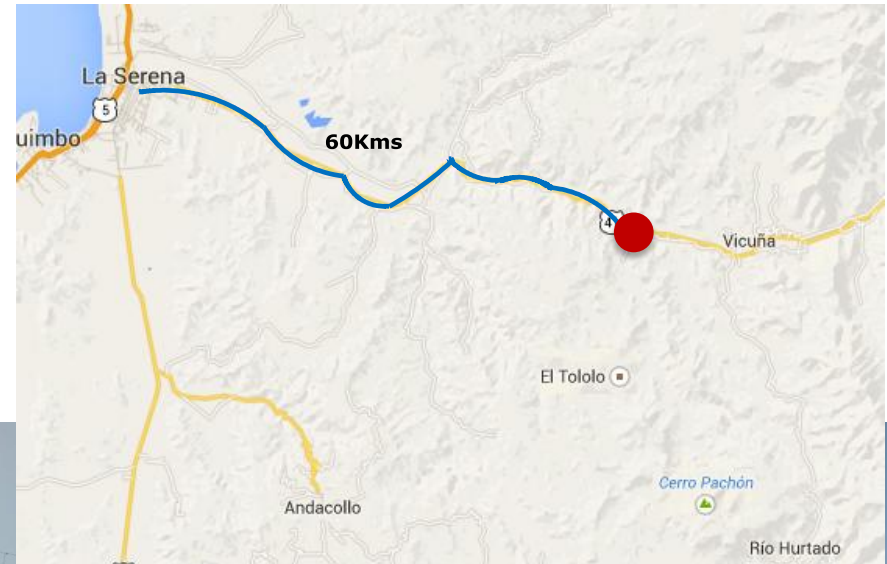


SubP1: La Serena – Observatory Gatehouse

Technical description

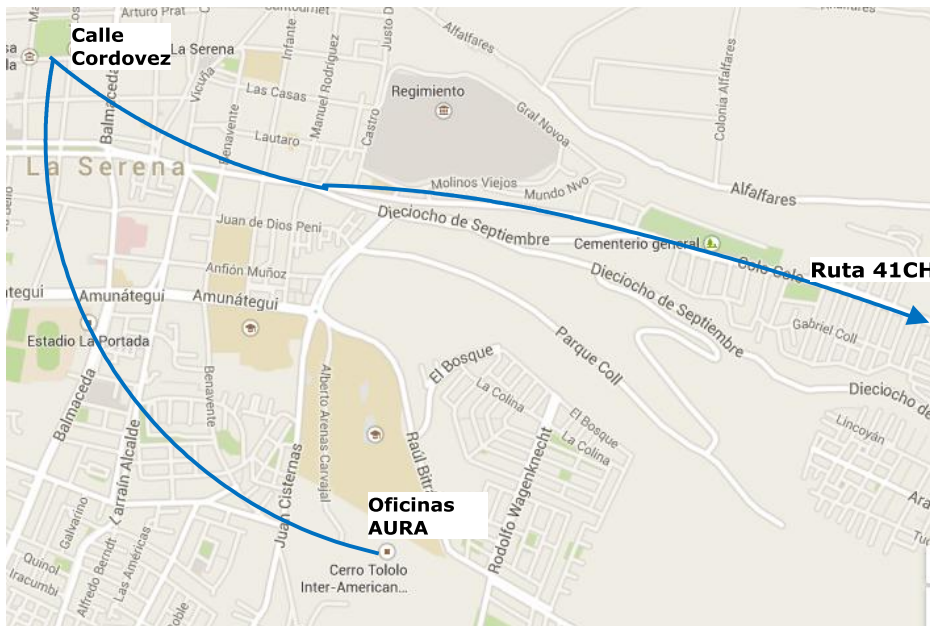
1. Fiber

- Filaments: 4
- Type: G.652
- Attenuation: 0,25 dB/Km a 1550nm.
- Length : 60Kms +/- 5%
- La Serena: AURA Colina el Pino
- Gatehouse: Vicuña road CH 41
- Path: One path
- Housing: Not necessary
- Date: Idem as fiber LS-Stgo

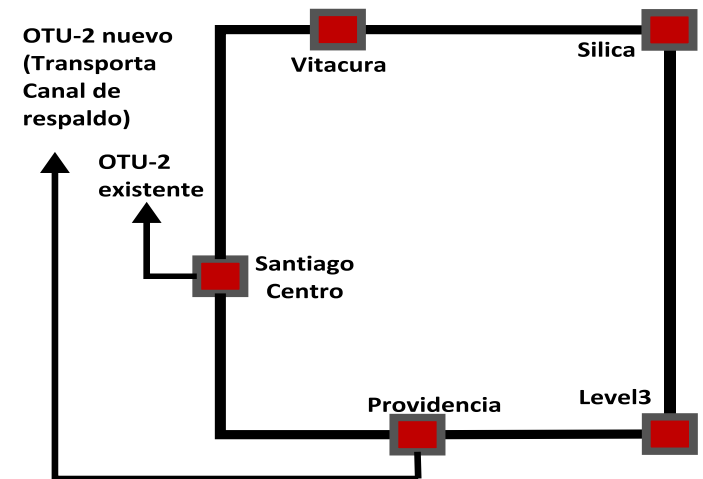


SubP1: Local loops

La Serena



Santiago



- 3 pairs of fiber
 - 2 to connect the 4 filaments from the Gatehouse
 - 1 to connect the 2 filaments from Santiago
 - 1 par with diverse path
 - Date: The same as fiber LS-Stgo

A stylized world map with a grid of latitude and longitude lines. Several circular nodes are placed on the map, connected by thin, curved lines representing network connections. The nodes are located in North America, Europe, and South America. The background is a light gray color.

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**Photonic network aligned with the furthest
regions**

Fibra Austral and BELLA projects

Fibra Óptica Austral

Key aspects

- Strategic project of the Chilean Government
- Deployment of submarine fiber to the southern region of the country
- Coordinated by undersecretary of Telecommunication
- **Planned to be operational 2017**

REUNA vision:

- The purpose is to deploy the photonic network over the submarine fiber to serve the education and research institutions of the region.

Today this region has terrestrial connectivity by Argentina



Sinergies with Fibra Óptica Austral

Education and research institutions in the region

•Punta Arenas:

- Universidad de Magallanes (www.umag.cl)
- Instituto Chileno Antártico (www.inach.cl)
- CEQUA (www.cequa.cl)
- Centro Universitario Puerto Williams (www.omora.org/)
- Centro Subantártico del Cabo de Hornos
- El Instituto de Ecología y Biodiversidad (www.ieb-chile.cl)
- Hospitales Regional y Clínico de Magallanes
- INACAP
- Sede U.Santo Tomás
- Fuerte vinculación con Instituciones Internacionales de investigación

•Aysén

- Centro de Investigación en Ecosistemas de la Patagonia (www.ciep.cl)
- Centro Universitario de la Patagonia, UMAG, Coyhaique
- Campus Patagonia UACH, Coyhaique
- Hospital Regional Coyhaique

Proyecto Fibra Óptica Austral

Entidad	Cantidad de Nodos
Comuna Cochamó	2
Provincia Palena	3

Entidad	Cantidad de Nodos
Comuna Tortel	1
Comuna Cochrane	1
Comuna Río Ibáñez	3
Comuna Chile Chico	1
Comuna Coyhaique	1

Entidad	Cantidad de Nodos
Comuna de Punta Arenas	1
Comuna de Porvenir	1
Comuna de Natales	1
Comuna de Cabo de Hornos	1

Fte: Mapa derivación nodos Ópticos, proyectos zonas extremas

BELLA Project

BELLA project



- New submarine cable to connect directly Latin America with Europe
- Private-Public partnership
- EC support with the condition to create the appropriate network infrastructure (100G compatible) in AL countries
- Chile is transit to the north (Perú) and to the east (Argentina).
- The east path is already solved
- The north path is aligned with the development of the national photonic network

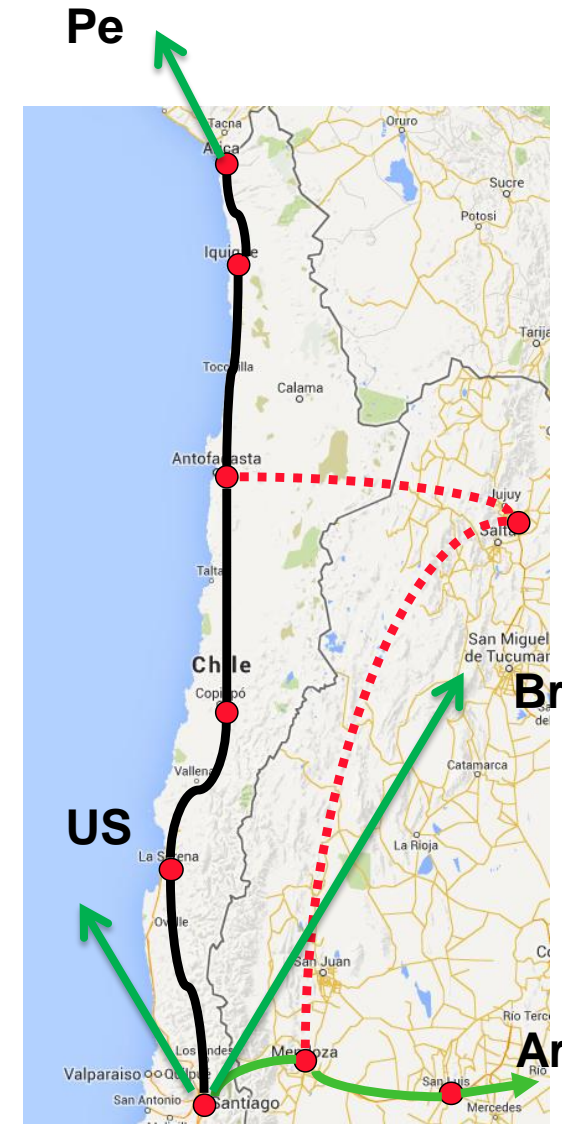


BELLA project

The east path (to Argentina) is already solved

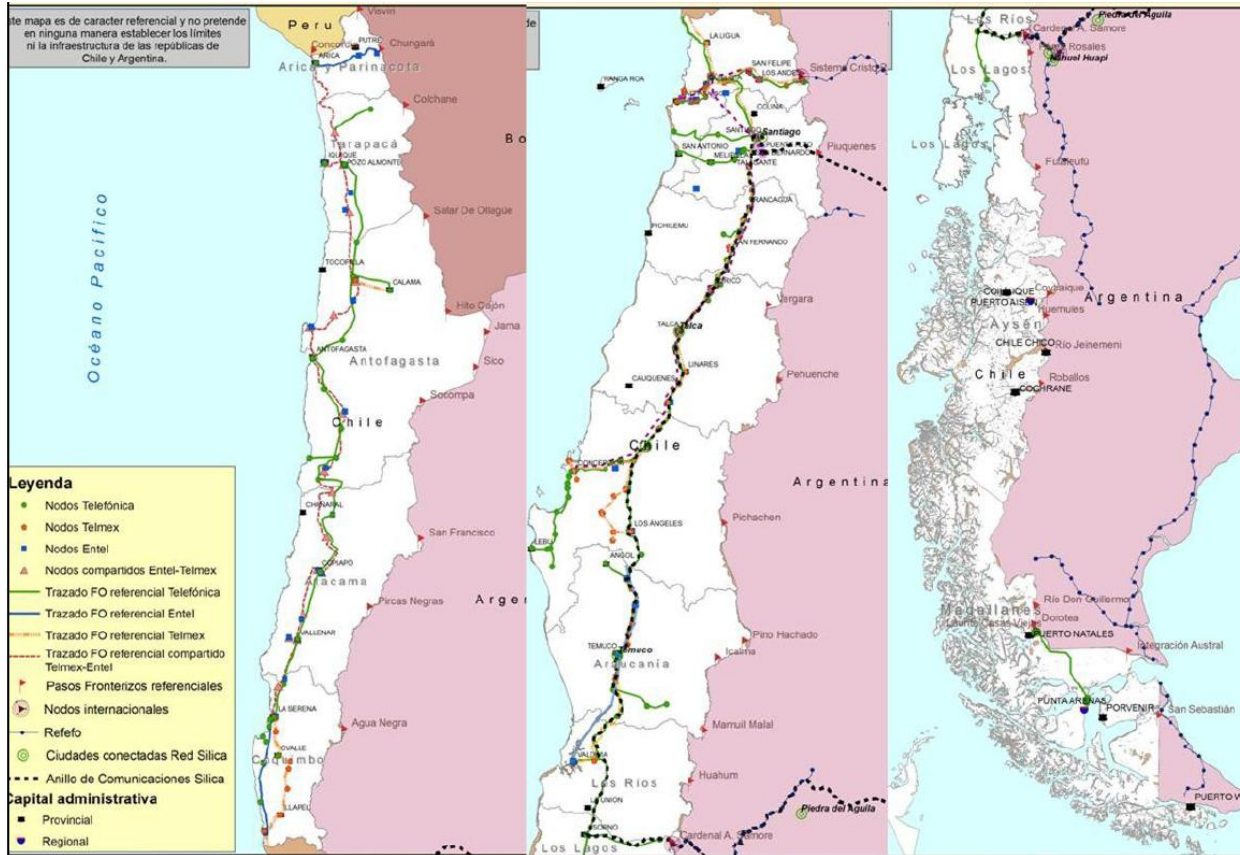
The north path is aligned with the development of the national photonic

Development strategy in synergy between the national R&E and RedCLARA backbone



E-infrastructure projects present synergic opportunities for robustness the network

Network infrastructure in Chile (2011)



Comments:

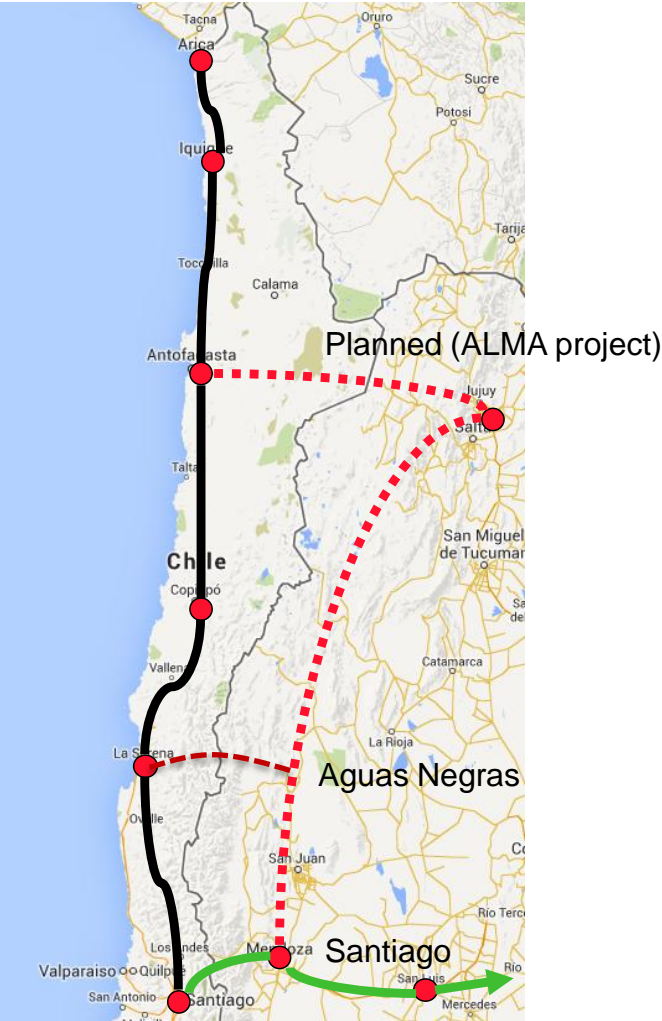
In general fibers goes by similar (identical) paths

TELCOS does agreements to shift fiber, so to have redundancy links

Terrestrial connectivity to the furthest south goes by Argentina

Source: Subtel, http://www.subtel.gob.cl/images/stories/apoyo_articulos/notas_prensa/ppt_desafio_economico_rnfo.pdf

Crossborder rings



The geography of Chile makes difficult to have a robustness network backbone

There are opportunities to continue a development strategy of backup links in synergy with international institutions and R&E partners of neighbor countries



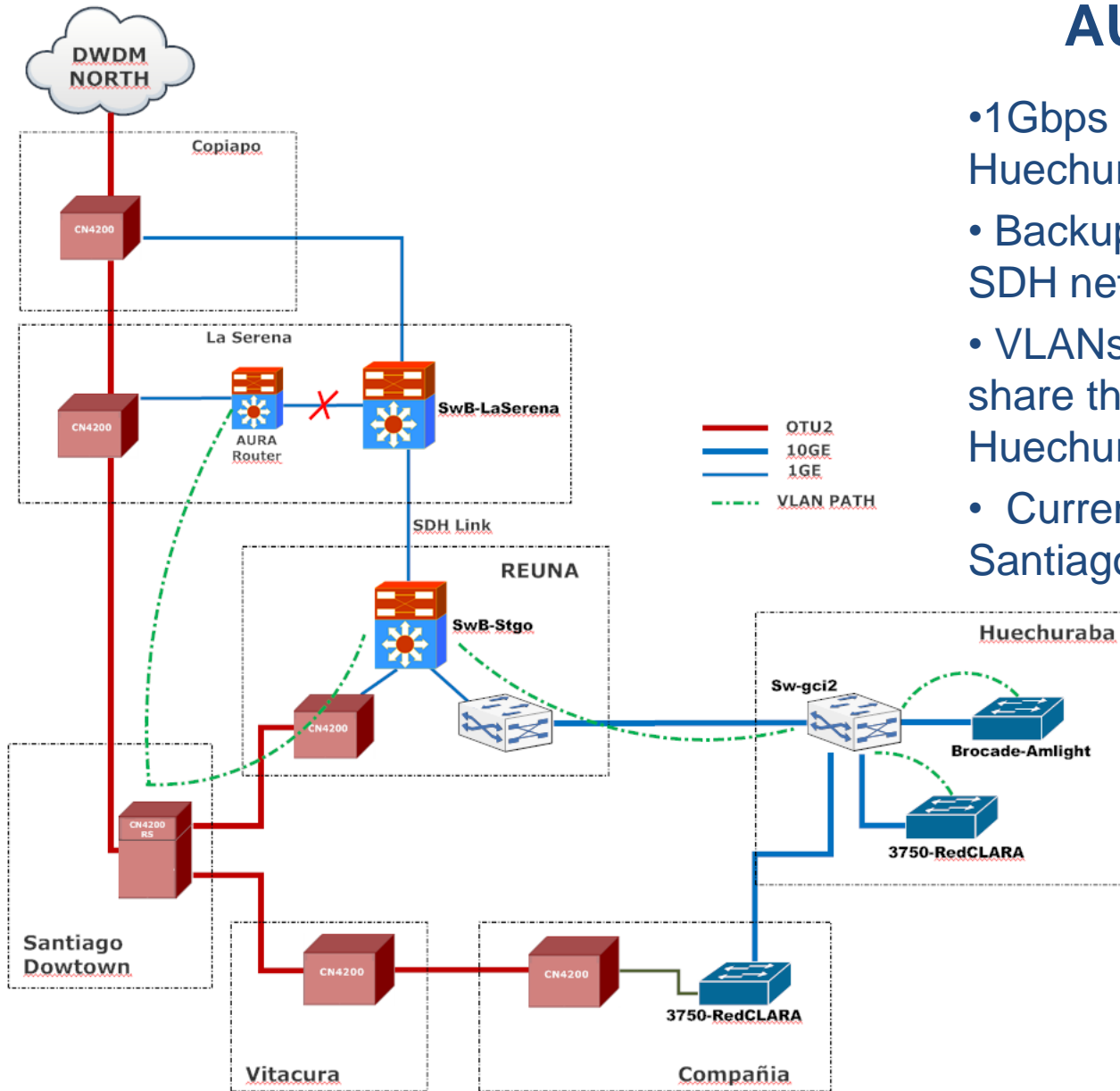
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Current network topology in La Serena and Santiago

Albert Astudillo
Network Engineer

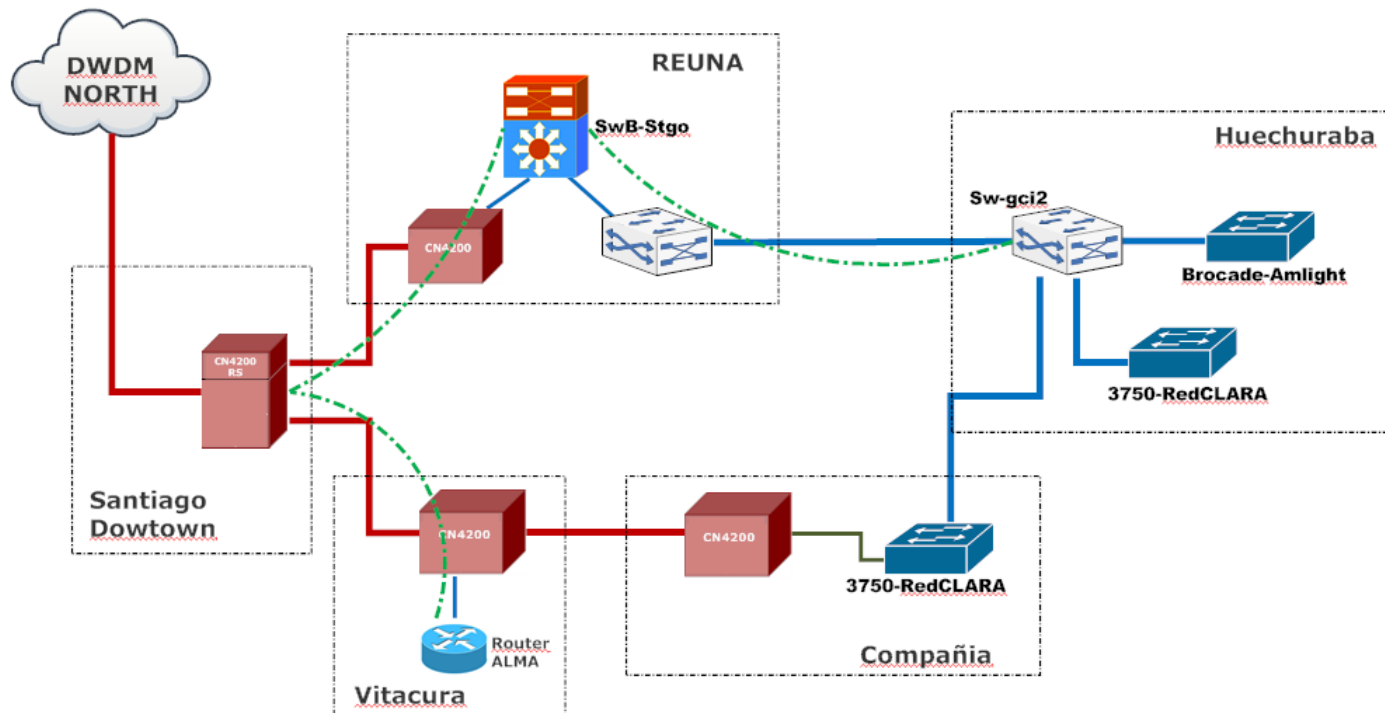
AURA Connectivity



- 1Gbps from La Serena to Huechuraba
- Backup to the north over the SDH network
- VLANs from AURA to Ampath share the same path until Huechuraba
- Currently 1Gbps backup over Santiago Ring

ALMA - NRAO - NAOJ

- 1Gbps Connection ALMA - REUNA
- Physical connection share between NRAO and NAOJ
- We are working to migrate to the same VLAN solution implemented with AURA
- 1Gbps backup over Santiago ring



Alma Deployment Summary

- Second Week of September of 2014 physical installation of equipment Padtec is performed.
 - During the installation two 1Gbps test links are rise between Calama and AOS.
- Third week of December we managed to fulfill the AOS – Vitacura link

Current Status:

- Both 1Gbps are performing according to the expectations
- Working to solve some issues discovered.



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