ALMA AOS/OSF-SCO Communication Infrastructure

Update for the 9th SAACC meeting 2017-10-19

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The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership among Europe, North America and East Asia in cooperation with the Republic of Chile.

PROJECT GOALS

- Provide a long term (>15 years) solution infrastructure
- Cope with projected operations needs (>1Gbps) and scale further
- Minimize latency between the end sites
- Have reasonable upfront CAPEX and very low OPEX
- Take advantage of the existing EVALSO capacity

Architecture of the communication system

1. A dark fiber pair between AOS and CALAMA (about 150km): this comes from a new built fiber cable.

2. A dedicated LAMBDA between CALAMA and the Point of Presence in ANTOFAGASTA (about 360 km).

3. A dedicated sub-LAMBDA between the REUNA PoP in ANTOFAGASTA and the SCO at the Vitacura Campus in Santiago: this is indeed reconfigured on the existing EVALSO backbone.

4. A dark fiber pair between AOS and the town of SAN PEDRO (2016).

5. A dedicated LAMBDA between AOS and Santiago via Argentina (2016-2018).

(Nearly) OPERATIONAL

Due to administrative hiccups (hopefully they will be cleared by end the year) the system is still formally used in “test mode”, but at full functionality:

- Delay (PING) between OSF and SCO around 25msec (same for both links).
- Science Data Traffic: between 150 and 300 Mbps, and peaks up to 800Mbps.
- Other ALMA Traffic: between 50 and 150 Mbps, and peaks up to 200Mbps.

We noticed an increase of use w.r.t. 2016.

OPERATIONAL REPORTS

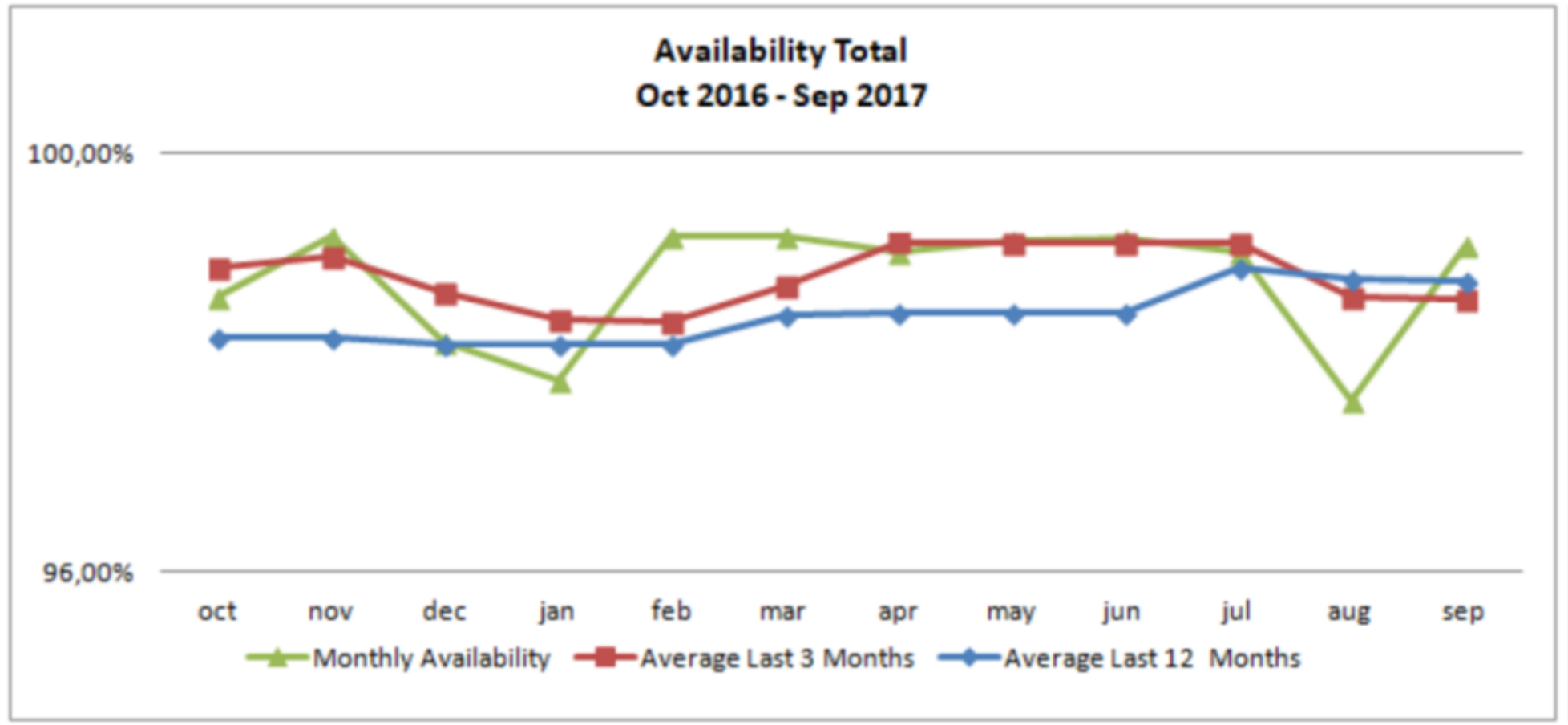
- Provided by REUNA since September 2015.
- Report on system performance, single downtime events, both planned and unplanned.
- Provides statistics on availability

Periods:

- Month: Sep 2017, 30 days, 720 hours
- Trimester: Jul 2017 to Sep 2017
- Year: Oct 2016 to Sep 2017, 365 days, 8760 hours

Availability	Monthly			Yearly		
	Uptime [hours]	Downtime [hours]	Availability [%]	Uptime [hours]	Downtime [hours]	Availability [%]
Planned	719,95	0,05	99,99%	8750,37	9,63	99,89%
Unplaned	719,28	0,72	99,90%	8724,24	35,76	99,59%
Total	719,23	0,77	99,89%	8714,6	45,39	99,48%

AVAILABILITY LAST 12 months



Atacama Large Millimeter/submillimeter Array

CWG 2017 meeting 2017-05-22/23

CONNECTIVITY via ALMA COMMUNICATION INFRASTRUCTURE

In search of our Cosmic Origins

Key Enablers

- The presence of a fiber cable in the Chajnantor area that connects to Calama and the Chilean communication backbone

- The availability of the policy for “Non-ALMA projects and experiments approval in the ALMA concession”

→ open to CWG members the possibility of fiber-based class communication.

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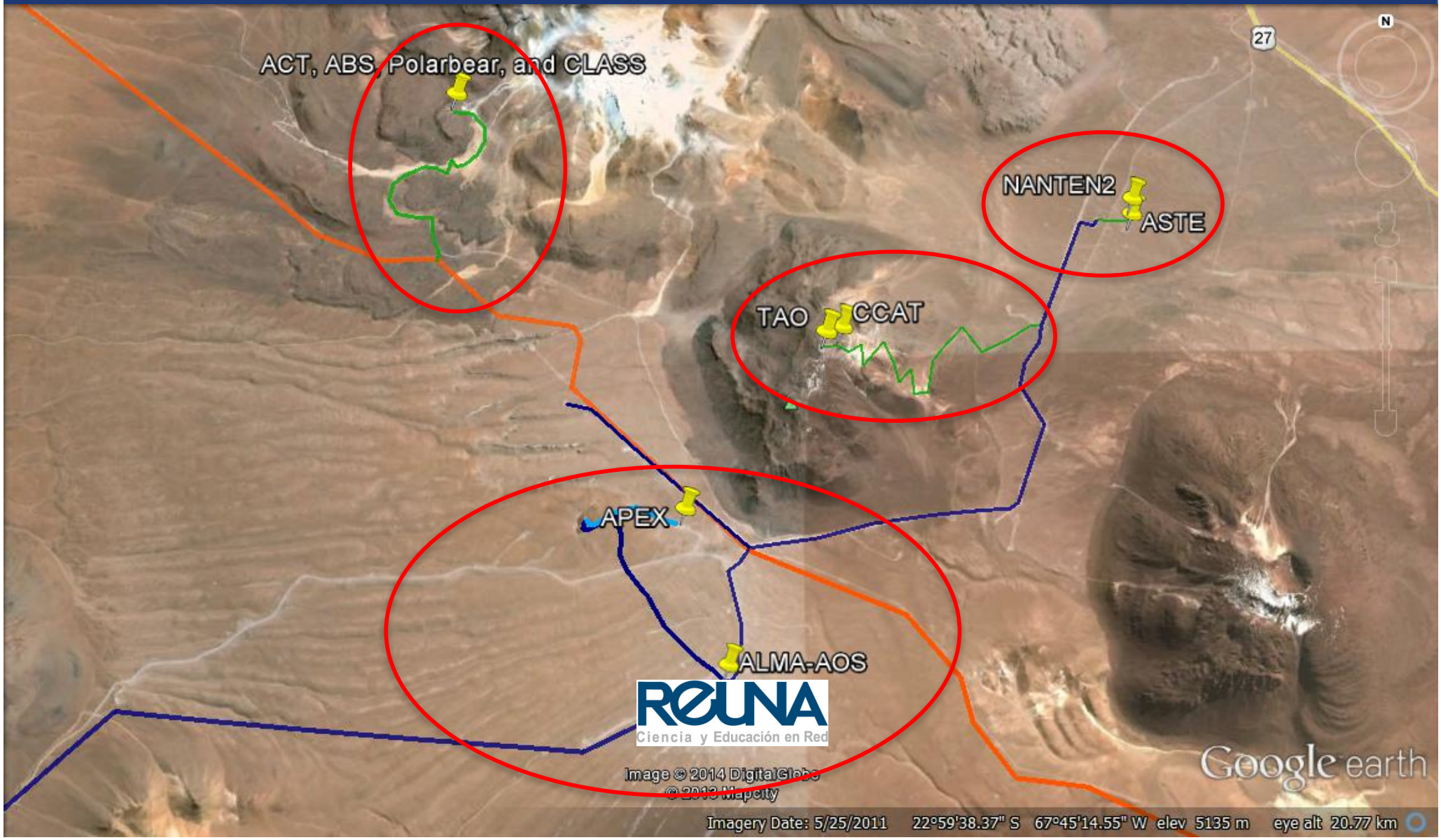
EXAMPLES of possible connections to existing cables



What next?

- Several projects (4 at the date) started the process to apply for resources, some of them form access to the communication system.

- A proof of concept experiment is on-going to create a 100Mbps between the APEX antenna at the Chajnantor plateau and the APEX scientific data archive operated by ESO Garching (Germany)