



Data transfer from ALMA to North America

David Halstead, Mark Lacy
National Radio Astronomy
Observatory



www.almaobservatory.org

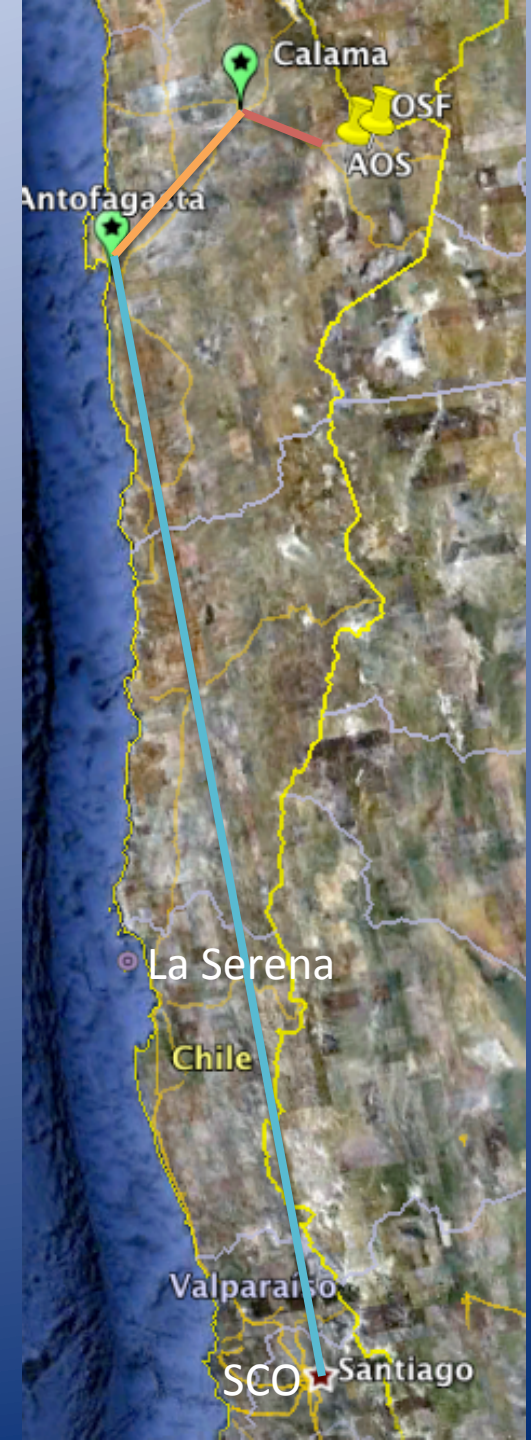


ALMA telescope

- Largest mm/submm telescope ever built.
- Interferometer – combines signals from multiple antennas to form an image.
- Partially complete (~27/66 antennas at high site).
- Completion scheduled for late 2013.
- Multinational project with many partners, three ALMA Regional Centers (ARCs): US, EU and EA
- Operated “space mission” style, with pipeline data processing and a science archive at each ARC allowing data reuse.

Data Transfer within Chile

- AOS to OSF: 1Gb/s dedicated fibre (upgradable to 10Gb/s)
- OSF to Calama: 100Mb/s (upgrade to 500Mb/s planned)
- Calama to Santiago: commercial to Antofagasta, REUNA Antofagasta to Santiago
- Pipeline run in Santiago to produce L2/L3 data products, increases data size by 10-30%.
- Primary ALMA archive in Santiago (SCO)
- Santiago to ARCs: individual ARC contracts.



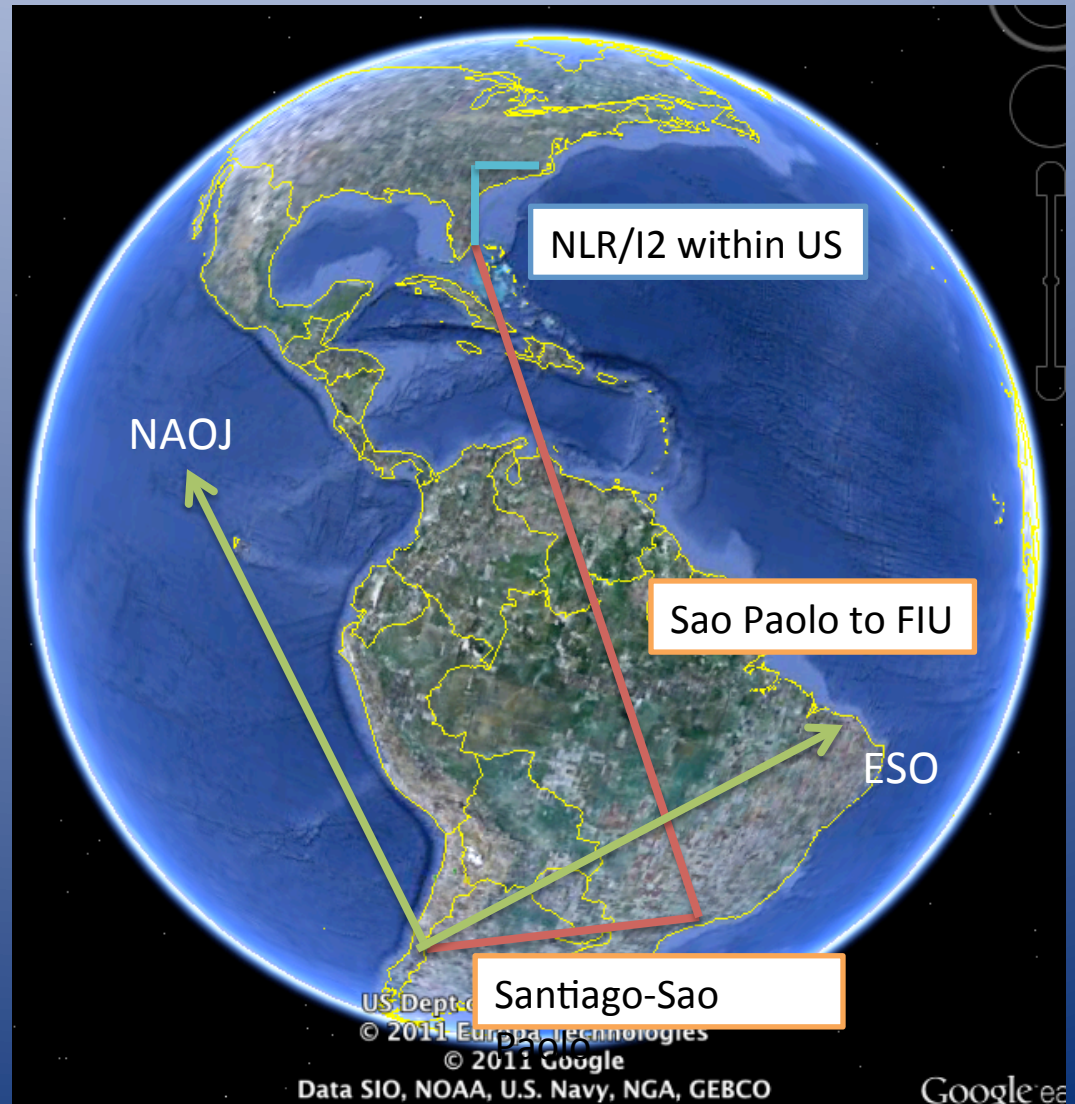
Data transfer – Chile to NA

Currently limited to 20Mb/s obtained through the Joint ALMA Observatory.

Joint AURA-AUI agreement for NRAO to have 100Mb/s committed (burstable to capacity) of AURA's 622Mb/s link to Chile through Sao Paolo and Miami (FIU) to the US research network backbone (NREN).

Will likely need ~1Gb/s (10% of 10Gb/s) by ~2016.

90% is bulk data with low QoS. Remainder is database sync and telepresence

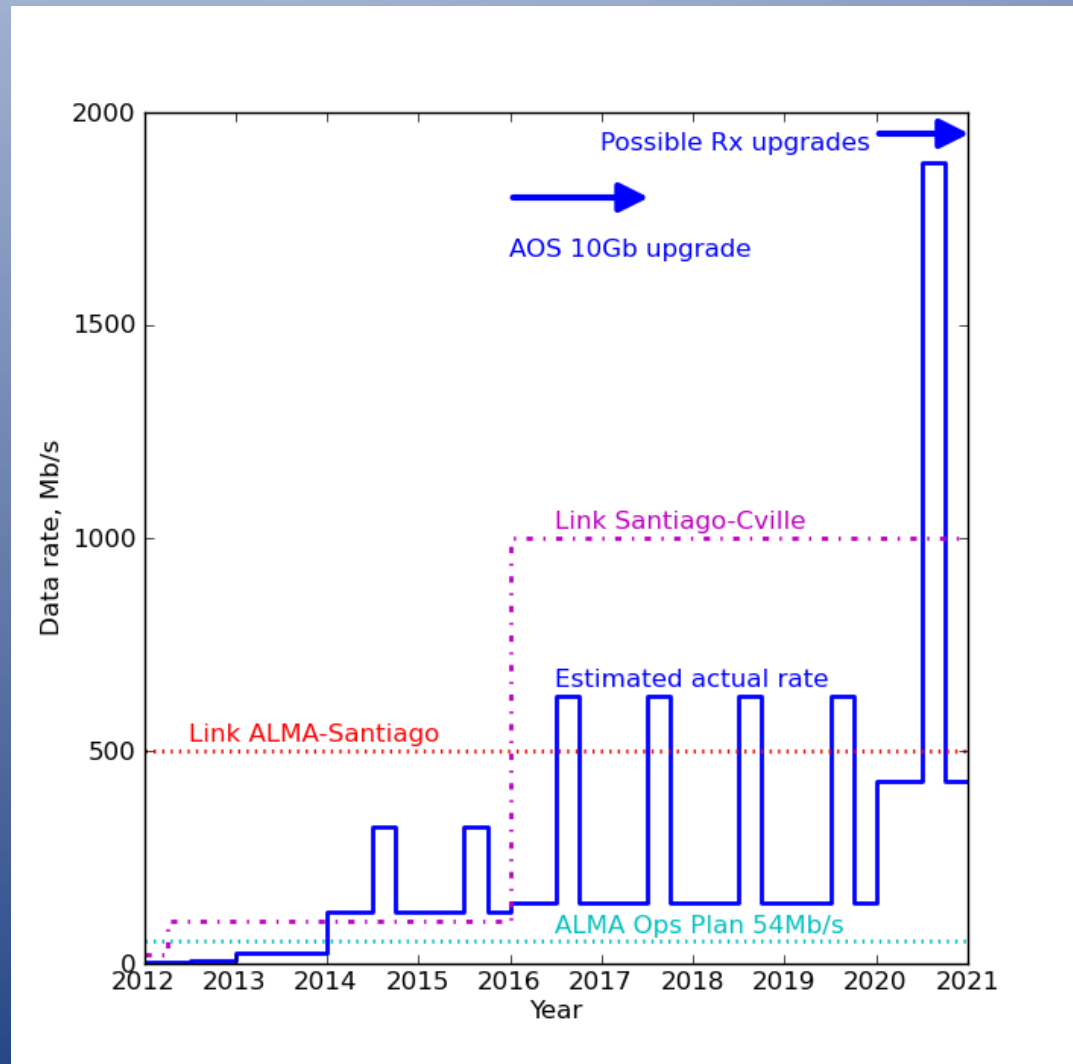


Data Rate Projections from SCO

Data rates will increase as further telescope capabilities become available and infrastructure upgrades made. Exact rate of growth unclear as international agreement required.

Data rates also expected to be highly seasonal, with peak rates during the Chilean winter (good conditions for extended arrays and high frequencies).

Expectation is that network will keep up week over week.



Paths from ALMA

