



U.S. DEPARTMENT OF
ENERGY



Simons Observatory and CMB-S4 Networking Update



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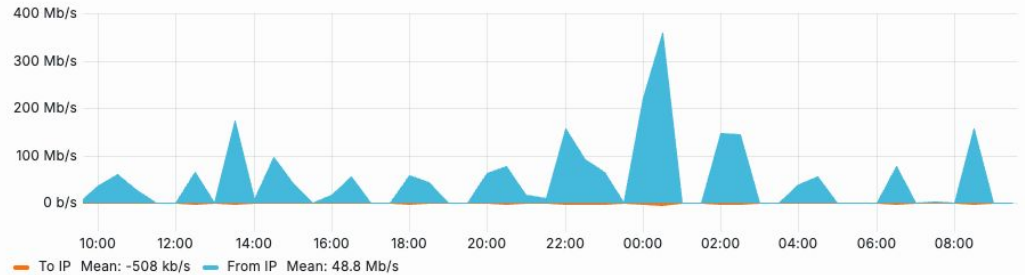
2025 SA3CC Meeting
La Serena, Chile
6 May 2025

Production Networking at Cerro Toco

- Fiber path from Simons Observatory to Alma
- Simons Observatory transfers from Cerro Toco to NERSC
 - Top: 24 hours
 - Bottom: 30 days

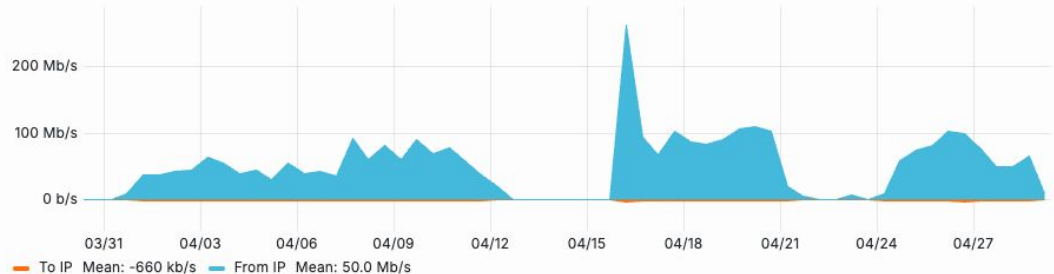
Traffic

49.3 Mb/s



Traffic

50.7 Mb/s

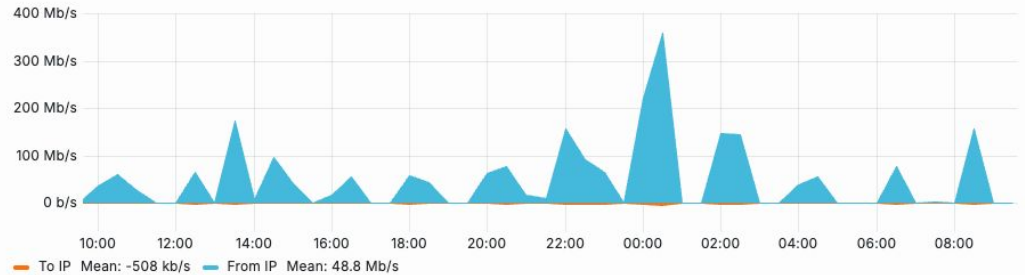


Production Networking at Cerro Toco

- Fiber path from Simons Observatory to Alma
- Simons Observatory transfers from Cerro Toco to NERSC
 - Top: 24 hours
 - Bottom: 30 days
- Note recovery after outage

Traffic

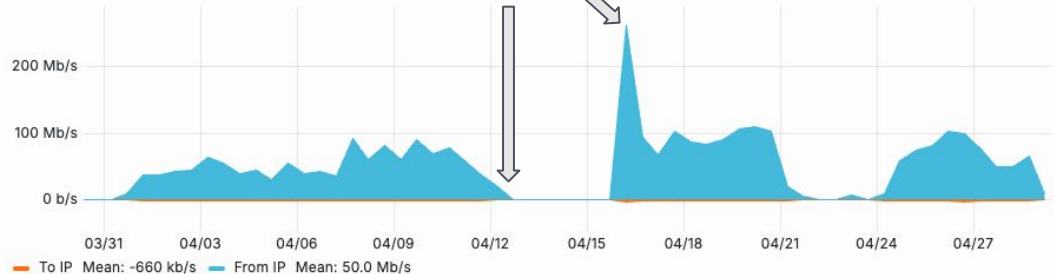
49.3 Mb/s



Traffic

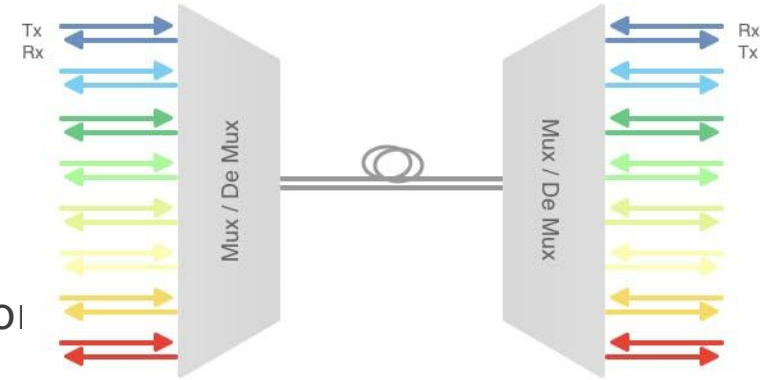
Outage and Recovery

50.7 Mb/s



Future-Proof: Additional Optical Channels

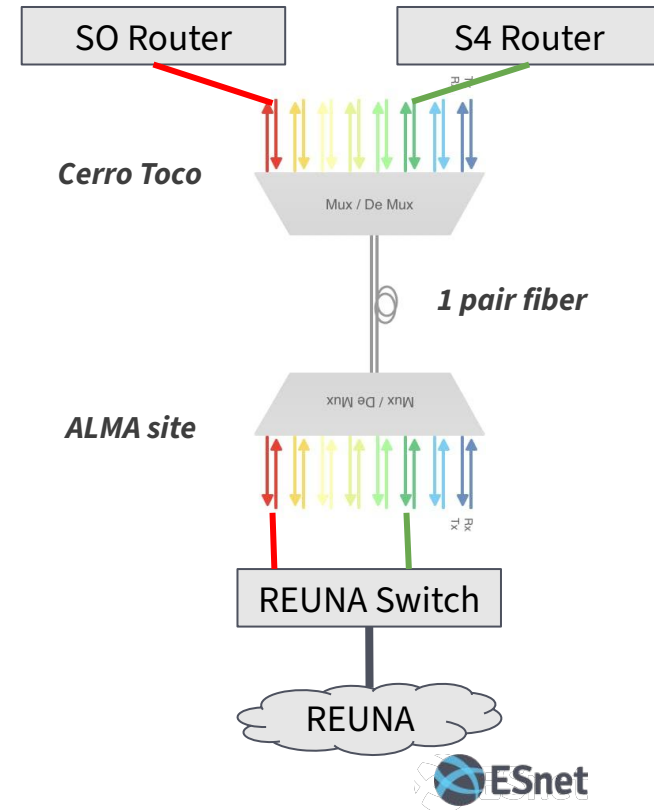
- Current system has 8 optical channels
 - Passive optical multiplexer (“mux”)
 - Simons Observatory is using one channel
- Each channel is capable of 10Gbps
 - Simons Observatory using 1Gbps today
 - Easy to increase bandwidth in collaboration with REUNA
 - Additional 1GE links
 - Convert to 10GE link
 - Multiple 10GE links
- Possibility of 100G per channel in the future, depending on optics availability
- Shoutout: REUNA, especially Albert



Notional example from vendor website

CMB-S4 Plans Evolving

- Chile-only plan for telescopes
- Increased data rate at Cerro Toco
- Current fiber deployment will meet the needs going forward
 - Deployment of CMB-S4
 - Expansion of Simons Observatory
 - Both!
- No fate sharing of active equipment
 - Completely passive, no electrical dependencies between channels
 - Each experiment can do what they need to do without affecting the other



CMB-S4 perfSONAR

- In collaboration with Simons Observatory, CMB-S4 is exploring the deployment of a perfSONAR server at Cerro Toco
 - Intent is to use the CMB-S4 channel on the CWDM fiber mux
 - Lightweight network presence - no ongoing high-bandwidth testing
 - There is space in the fiber rack in SO Container C1
- Multiple reasons for this
 - Tangible evidence of progress for funding agencies
 - Provide operational experience with network measurement for CMB-S4
 - Ability to characterize network paths as data plans continue to develop
- Many thanks to REUNA and SO
 - Albert Astudillo
 - David Boettger
 - Jeff Makey
 - Others, I'm sure!

Update: This has taken longer than we anticipated, for a variety of reasons.

To be clear: the delays have been on the S4 side. Albert in particular has been very helpful!



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Thanks!



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