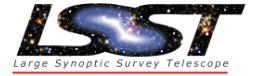


02C.08 Summary

Jeff Kantor

May 9 2017

02C.08 International Communications and Base Site



– International Communications

- Includes these networks:
 - Summit – Base (Telefonica/Cobra install, AURA/REUNA operate)
 - Base LAN (AURA procure/install/operate)
 - Base – Chicago (FIU/AmLight provision, manage operations, ESNet participation)
- Does not include:
 - Summit Network (T&S 04C.12.5 WBS with same TCAM and Technical Lead as 02C.08)
 - Chicago to Archive (DM 02.07.04 WBS under NCSA)
- Integrated LSST Network Engineering Team (LSST:NET) provides engineering, test, management coordination, virtual Network Operations Center (NOC) across all networks and WBS
 - LSST Network Operations and Management Plan (document-11918)
 - LSST Long-Haul Networks End-to-End Test Plan (document-14789)

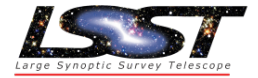
– Base Site

- Includes installation and operating costs during MREFC, supporting Commissioning at Base Site
 - Base Center
 - Chilean DAC

– Not part of DM replanning effort

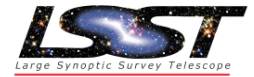
- All changes to date have been driven by restructuring of contracts and aligning to vendor dates
- All replanning has been implemented as LSST Change Requests throughout Construction
- All changes are completely captured in PMCS
- There has been no significant net change to the overall technical scope, budget, critical path schedule

02C.08 Work Packages



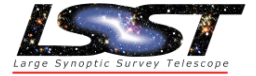
WPNUMBER	WPNAME	WBSNUMBER	Description
KLM20800A	ICB-MAN	02C.08.00	Management, Engineering, Integration of International Communications and Base Site. This is the TCAM (Kantor)
KLM20801A	ICB-BASE	02C.08.01	Base Center. This is installation of equipment and power and cooling costs during construction and commissioning. It is NOT the equipment procurement, that is in 02C.07.04 (NCSA), and OCS/TCS (04C.xxx)
KLM20802A	ICB-CDAC	02C.08.02	Chilean DAC. This is installation of equipment and power and cooling costs during construction and commissioning. It is NOT the equipment procurement, that is in 02C.07.04 (NCSA).
KLM20803A	ICB-LHN-LS - SCL	02C.08.03.01.01, 01A, and 02, and LS - SCL part of 04 and 05	Chilean National Networks (La Serena - Santiago, La Serena - AURA Gatehouse). This is network design, fiber path design and installation, equipment procurement and installation, integration and acceptance tests. It includes the REUNA contract (and subcontractor Telefonica) and a small consulting contract to Fernando Liello.
KLM20803D	ICB-LHN-MTN-BASE	02C.08.01.03 and Mtn-Base part of 04 and 05	Mountain - Base Network (Summits - AURA Gatehouse). This is network design, fiber path design and installation, equipment procurement and installation, integration and acceptance tests. Includes DWDM Equipment. This is the equipment procurement and installation and test to light the Mountain - Base links.
KLM20803B	ICB-LHN-INTL	02C.08.03.02.01, 02, and 03	International Networks Santiago - Miami, Santiago - Boca Raton). This is network design, contracted network services, equipment procurement and installation, integration and acceptance tests for 100G Ring and Spectrum link. Also managing the FIU subcontractors, coordinating the End-to-End Test design and Network Engineering Team, interacting with other Research and Education networks in conferences and workshops, supporting the South American Astronomy Coordination Committee (SAAAC).
KLM20803C	ICB-LHN-US	02C.08.03.02.04	US National Networks (Miami - Chicago, Boca Raton - Chicago, Miami - Tucson, Miami - SLAC). This cost is covered in operations as we expect to leverage institutional accounts on internet2 and ESNet during construction and commissioning.

02C.08 Work Package Costs



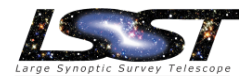
WPNUMBER	WPNAME	\$COST	PERSONYEARS	\$NLCOST	WBSNUMBER
KLM20800A	ICB-MAN	\$432,000.00	3.0	\$25,000.00	02C.08.00
KLM20801A	ICB-BASE	\$48,000.00	0.3	\$381,000.00	02C.08.01
KLM20802A	ICB-CDAC	\$15,000.00	0.1	\$0.00	02C.08.02
KLM20803A	ICB-LHN-LS - SCL	\$511,000.00	3.4	\$6,248,000.00	02C.08.03.01.01, 01A, and 02, and LS - SCL part of 04 and 05
KLM20803D	ICB-LHN-MTN-BASE	\$133,000.00	0.9	\$3,118,000.00	02C.08.01.03 and Mtn-Base part of 04 and 05
KLM20803B	ICB-LHN-INTL	\$390,000.00	2.5	\$17,172,000.00	02C.08.03.02.01, 02, and 03
KLM20803C	ICB-LHN-US	\$86,000.00	0.5	\$0.00	02C.08.03.02.04
TOTAL		\$ 1,615,000.00	10.7	\$26,944,000.00	

02C.08 Team



- Current workforce
 - 1.3 FTE (Jeff Kantor TCAM 50%, Ron Lambert Network Architect 80%)
 - NCSA support (Matt Kollross ~25% under WBS 02C.07)
- Projected Workforce
 - 4.3 FTE: 2 new hires in May - June 2017 (Net Eng/IT Tech)
 - 5.3 FTE: 1 new hire in June - July 2017 (Sys Eng/Admin)
 - 50% DM funded, 50% T&S funded, already in baseline
- Contract resources
 - REUNA (Sandra Jacque, Paola Arrellano & team)
 - Telefonica (Sandra Antonieta Abarca Poblete, Julio Gonzalez Alarcon, Juan Francisco Rojas Grimberg, & team)
 - FIU/Amlight (Chip Cox, Julio Ibarra, Heidi Morgan, J. Bezerra, & team)

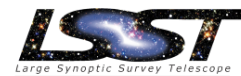
F17 Activities



Chilean Contract 1 La Serena-Santiago Fiber		
DMTC-8000-0816	Test Equipment Installation and Acceptance Test - Complete	28-Jul-17
Chilean Contract 1a La Serena-Gatehouse Fiber		
DMTC-7400-2090	Report on functional fiber connections, including AURA equipment - Complete	18-Aug-17
Chilean Contract 3 Summits-Gatehouse Fiber		
DMTC-7400-2250	End of commissioning and Acceptance - Complete	1-Jun-17
Chilean Contract 4 Network Equipment Purchase/Contract		
DMTC-7400-2330	LSST and AURA summit to base DWDM equipment - Complete	29-Jun-17
DMTC-7400-2420	REUNA La Serena - Santiago DWDM equipment - Complete	29-Jun-17
<i>DLP-65</i>	<i>Mountain - Base LSST and AURA DWM End Node Installation and Test Ready</i>	<i>14-Mar-18</i>
International Contract 1 100G managed ring		
DMTC-8100-2090	100G ring operating at 97.0% availability - Complete	28-Sep-17
International Contract 3 Spectrum Contract		
DMTC-8100-2478	Agreement with Monet Cable Partner signed	3-Aug-17
DMTC-8100-2480	Manage First light test report	28-Aug-17
Summit Network (TS)		
T&SC-2600-1115	Network equipment Received and Accepted	13-Jun-17
T&SC-2600-1130	Beneficial occupancy of the Summit Facility	8-May-17
T&SC-2600-1230	Full occupancy computer room ready	8-Jun-17

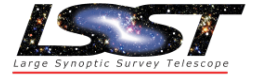
Note: US Networks in discussions with ESN/DOE

Network Engineering Team



- Integrated LSST Network Engineering Team (LSST:NET) provides engineering, test, management coordination, virtual Network Operations Center (NOC) across all networks and WBS
 - Members:
 - Ron Lambert (AURA/LSST Network Architect)
 - Jeronimo Bezerra (FIU/Amlight Network Architect)
 - Matt Kollross (NCSA Network Architect)
 - Humberto Galiza (FIU/Amlight Network Engineer)
 - Albert Astudillo (REUNA Network Engineer)
 - Shahram Sobhani (AURA/LSST Network Engineer)
 - Managers/Executives:
 - Sandra Jaque (REUNA Manager of Technology)
 - Julio Ibarra (FIU Assistant VP)
 - Jeff Kantor (LSST International Networks and Base Site TCAM)
 - Donald Petravick (NCSA LSST Principal Investigator)

Network Verification Plan and Matrix



- [Networks home page in Confluence](#)
- System Engineering Verification Matrix format/terms
 - Lower Level (LL): below DM Subsystem Level, e.g. Network segments)
 - Same Level (SL): DM Subsystem Level
 - Higher Level (HL): LSST System Integration/Commissioning
- Goal is to verify network up to layer 2.5/3 (LL)
 - Networks Verification Plan covers all networks (DM and TS) except NCSA - Lyon
 - Assumes execution of tests in E2E plan are done, picks up there for “final” verification
 - Most testing done with simulated data, test stands, “stubbed” interfaces
 - Presumes some tests repeated in DM Verification with real data, real DMS interfaces, but possibly volume/rate/failure mode limited (SL)
 - And again in commissioning w/ComCam, full scale, etc. (HL)

- We need to engineer the Summit – Base Complex as one ITC entity, with a consistent, coherent design
- This cuts across subsystems that contribute facilities, equipment, software, operational policies and procedures
- Many point-to-point communications and some workshops have tried to address various aspects of this as the subsystems have tried to do the work required in their “silos”, but...
- We need a more integrated approach to achieve the goal in time for early integration and through end of commissioning.
- This work will be done in cross-subsystem “tiger team”, with a defined set of deliverables and plan/schedule to provide them (and a T/CAM to track and report on it)

- Early focus on ensuring Base – Summit Complex is optimally engineered to avoid ITC gaps, redundancies, inefficiencies
- First phase is only information collection, any decisions come later, with full vetting, discussion, impact analysis by subsystems, PMO, SE

- [SBTT home page in confluence](#)
- Plan is for Tiger Team work to be largely complete by LSST 2017 meeting, present results, disband
- Major deliverable is [Summit – Base ITC Design Document](#) which will be submitted to CCB for baseline as LSE-xxx
 - SBIDD is now fairly complete for Summit, Summit – Base
 - Priority for Telescope Assembly, Integration, Verification (AIV), including Auxiliary Telescope
- Not yet ready for Base
 - Timing of Base Computer Center
 - Control Room Design
- Ready to get broader (outside TT) review
 - Invitation for comments (RFC coming)