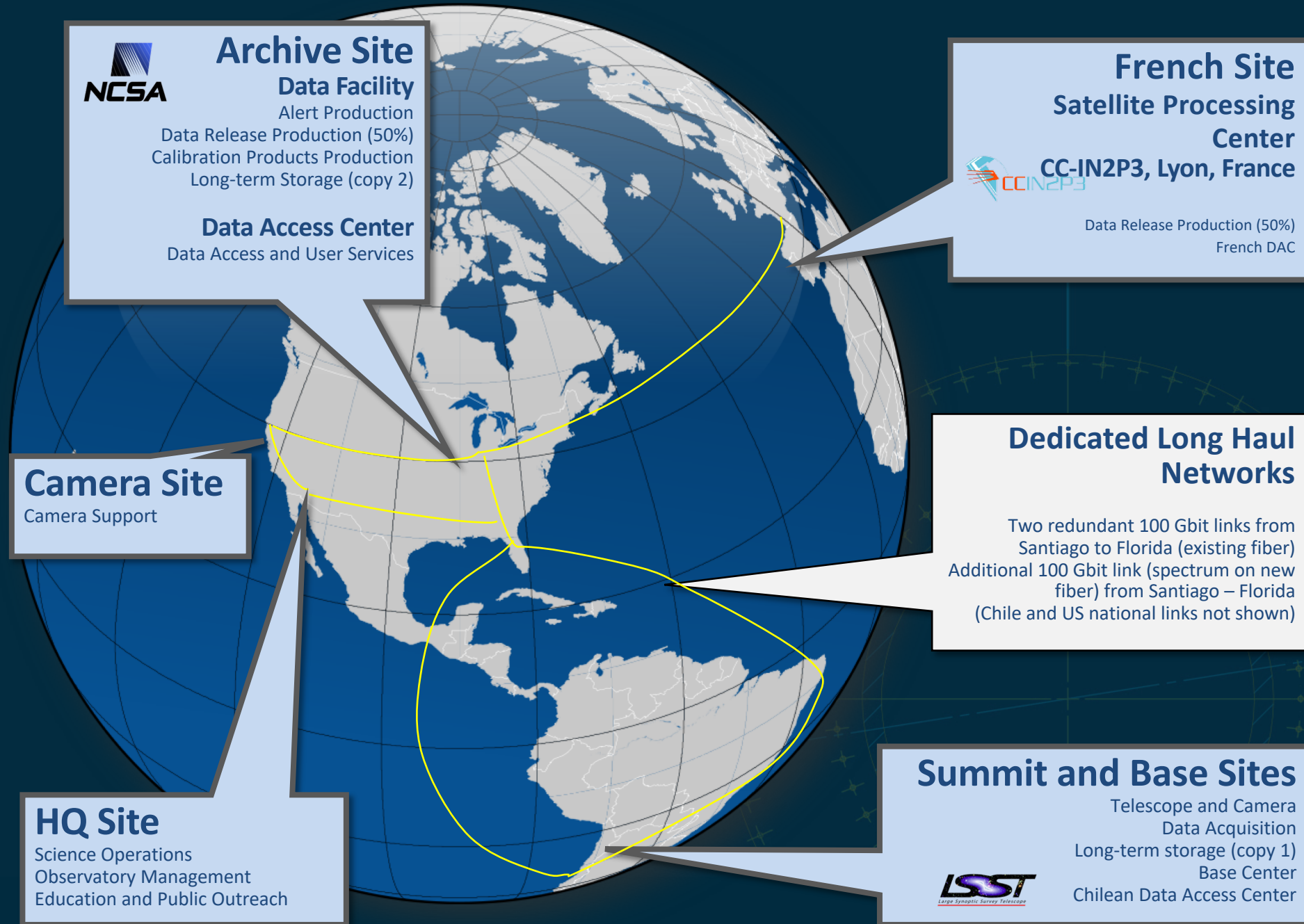


Rubin Observatory

Networks Construction and Commissioning
Jeffrey Kantor
South American Astronomy Coordination
Committee (SAACC) Meeting
April 21 – 22, 2020





Archive Site

Data Facility

Alert Production
Data Release Production (50%)
Calibration Products Production
Long-term Storage (copy 2)

Data Access Center

Data Access and User Services



French Site

Satellite Processing Center

CC-IN2P3, Lyon, France

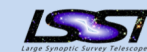
Data Release Production (50%)
French DAC

Dedicated Long Haul Networks

Two redundant 100 Gbit links from Santiago to Florida (existing fiber)
Additional 100 Gbit link (spectrum on new fiber) from Santiago – Florida (Chile and US national links not shown)

Summit and Base Sites

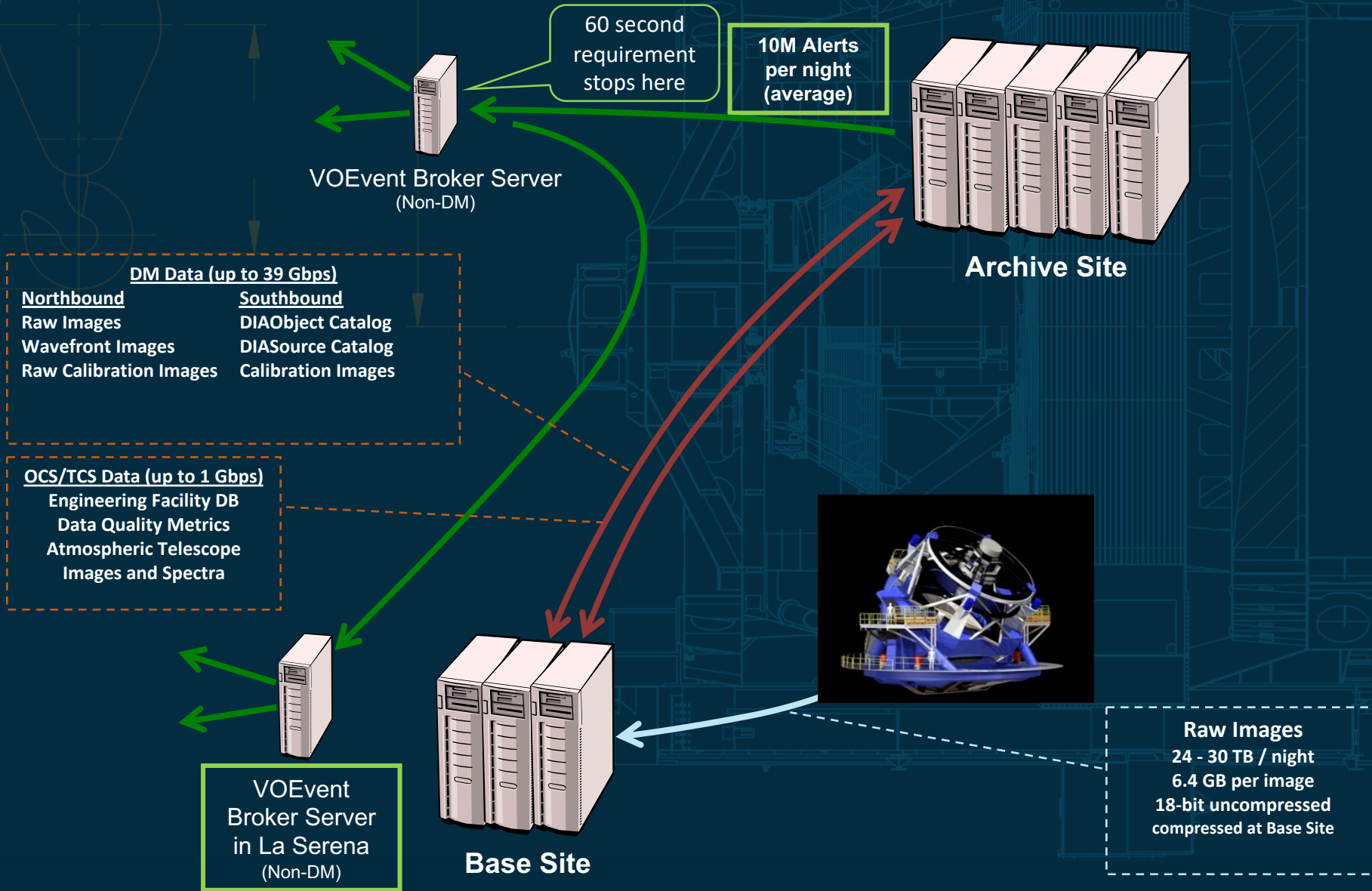
Telescope and Camera
Data Acquisition
Long-term storage (copy 1)
Base Center
Chilean Data Access Center



LSST Data Products and Distributed Computing

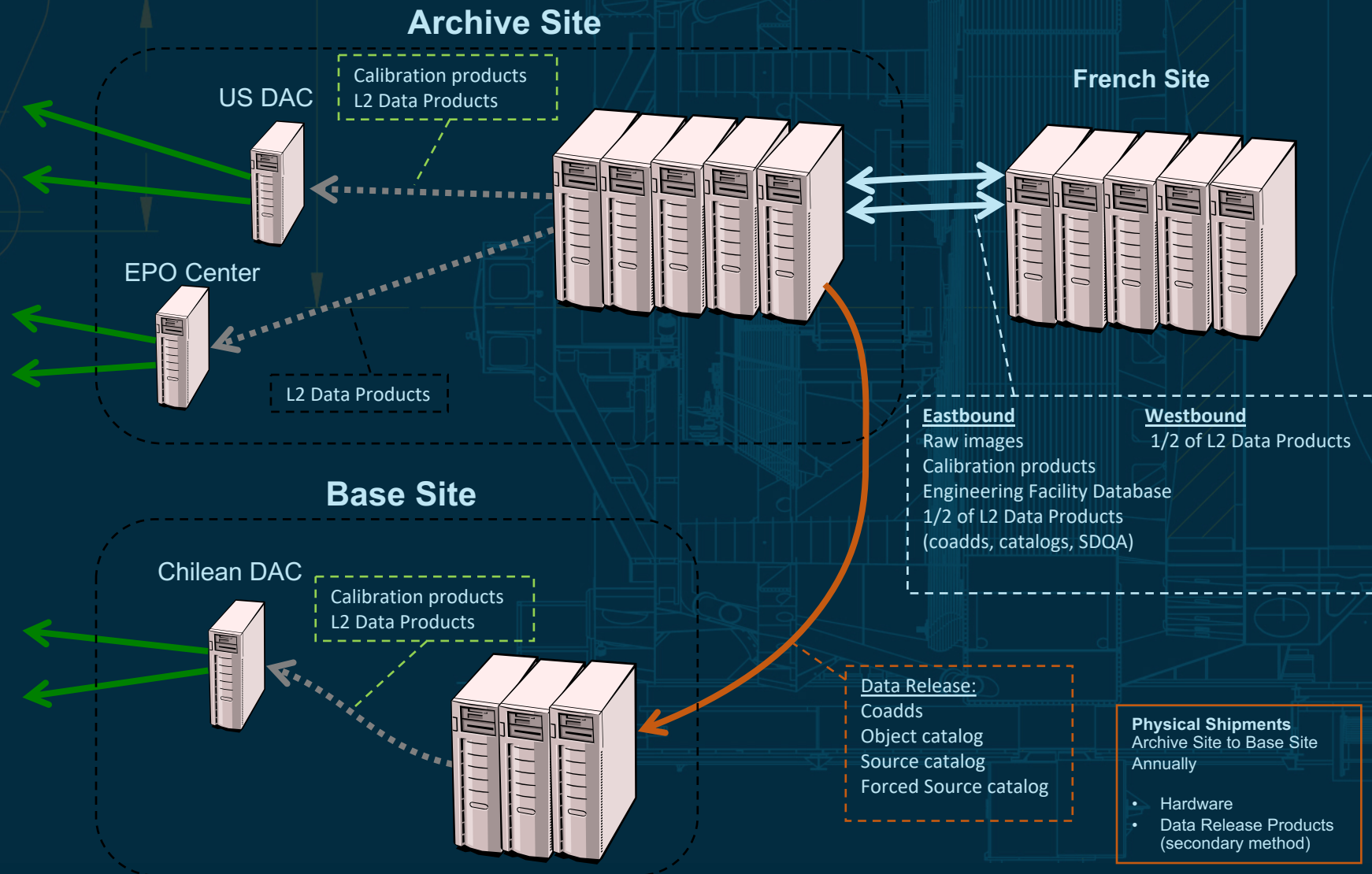
- Nightly data products
 - Alerts
 - Difference images and catalogs
 - 60s latency from time of readout from camera
- Annual data products
 - Process all accumulated data from start of survey (distributed US, France)
 - Produces all nightly data products plus
 - Catalogs of deep, faint objects
 - “Forced” photometric measurements
- Supporting community-developed data products
 - “Nearby” computing and storage at Data Access Centers
 - Software (middleware, pipelines, algorithms, tools)

Nightly Data Flows

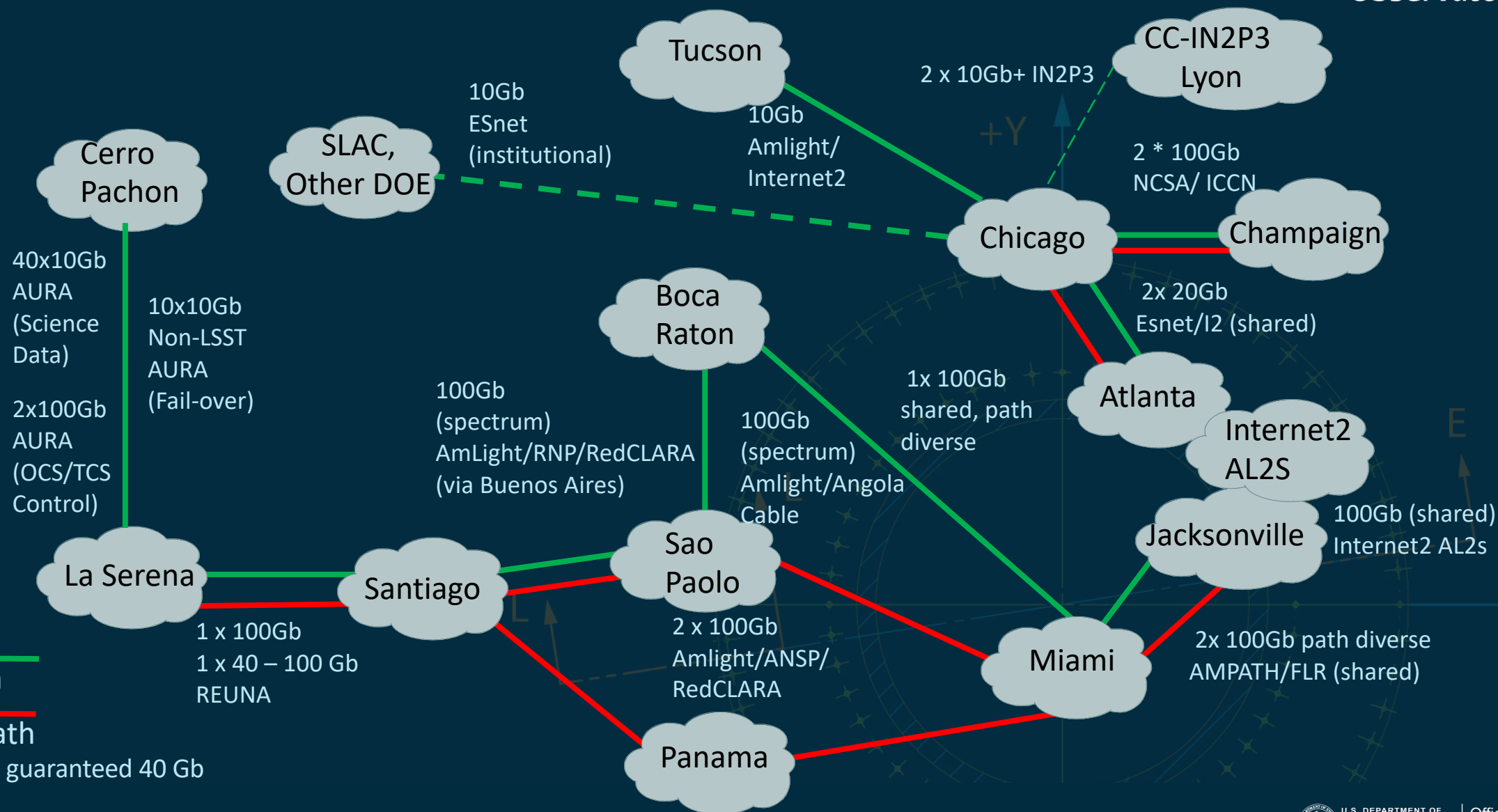


Non-Nightly Data Flows and Distributed Computing

Rubin
Observatory

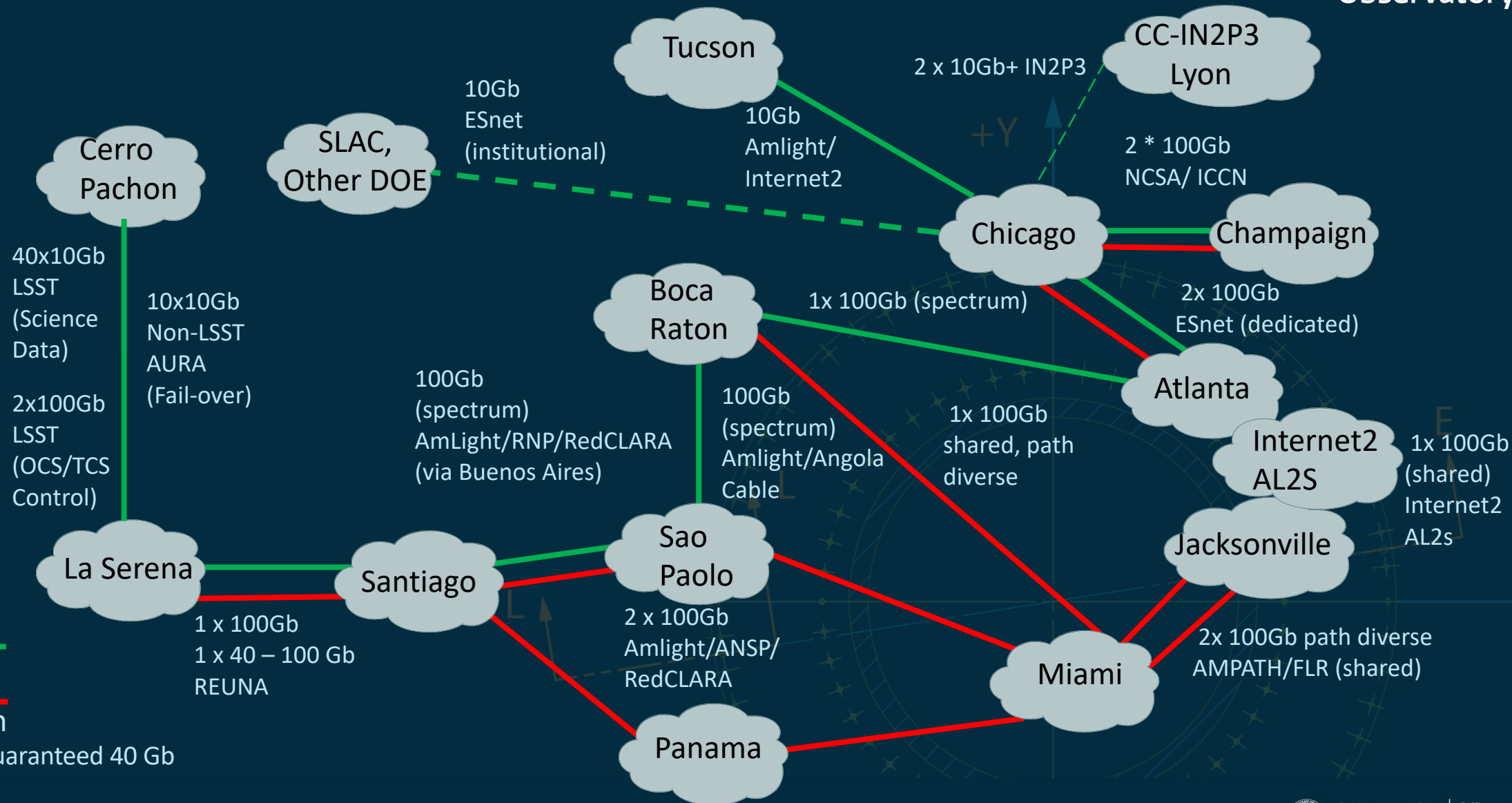


LSST Long Haul Network Links (Baseline FY20)



LSST Long Haul Network Links (Baseline FY22)

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Observatory



Primary Path

Secondary Path

Shared links are guaranteed 40 Gb



End-to-End Network Bandwidth Evolution

MILESTONE LEVEL	ID	ACTIVITY	BASELINE FINISH	PROJECTED FINISH	END-TO-END B/W, Cerro Pachon - La Serena	END-TO-END B/W, La Serena - NCSA	Bandwidth Achieved through Demonstration
2	DM-NET-1	Base - Archive Network Functional 1 Gbps	6/11/15	6/11/15	0.5 Gbps	Max: 1G Best Effort	0.5 Gbps (operational)
2, 3	DM-NET-2, -3, 6, DMTC-6800-1310	Mountain - Base Network Functional 2 x 100 Gbps, Summit LAN Installed, Initial Network Ready (Summit), Network Acceptance/Verification Review for Early Integration	3/27/18	6/30/18	2 x 100 (shared AURA DWDM)	Max: 20G Best Effort	46Gbps (LSST First Light demo)
3	DM-NET-4, DMTC-6800-1320	Base LAN installed, Network Acceptance/Verification Review for Full Integration	11/30/18, 7/3/19	10/15/19	6 x 100 (dedicated LSST DWDM) + 2 x 100 (shared AURA DWDM)	Max: 20G Best Effort	80Gbps (LSST SC18 demo)
		Auxiliary Telescope Spectrograph on Sky Observing		1/1/20			
3	DM-NET-5	Base - Archive Network Functional 100 Gbps	7/3/19	1/1/20	6 x 100 (dedicated LSST DWDM) + 2 x 100 (shared AURA DWDM)	Max: 40G Best Effort	
		Commissioning Camera on Test Bench Observing	1/0/00	4/1/20			
3	DMTC-6800-1330	Network Acceptance/Verification Review for Science Verification	7/6/20	7/6/20	6 x 100 (dedicated LSST DWDM) + 2 x 100 (shared AURA DWDM)	Max: 140G Best Effort	
		Data Preview 0 Start	1/0/00	12/15/20			
		Commissioning Camera on Sky Observing	1/0/00	4/23/21			
3	DMTC-6800-1340	Network Acceptance/Verification Review for Full Operations	7/2/21	7/2/21	6 x 100 (dedicated LSST DWDM) + 2 x 100 (shared AURA DWDM)	Max Dedicated: 200G dedicated up to NCSA. 300G at NCSA. Burst: 100G	
		Data Preview 1 Start	1/0/00	8/24/21			
		Ful Camera on Sky Observing	1/0/00	10/12/21			
		Data Preview 2 Start	1/0/00	2/15/22			

Note: LSST internet, web, voice, video go over AURA circuits, which are shared, and are currently limited by 1G Firewalls in LS and 10 Gbps internet2 links in the US. This will be improved by the end of FY19 by the move to 10 G firewalls in LS.