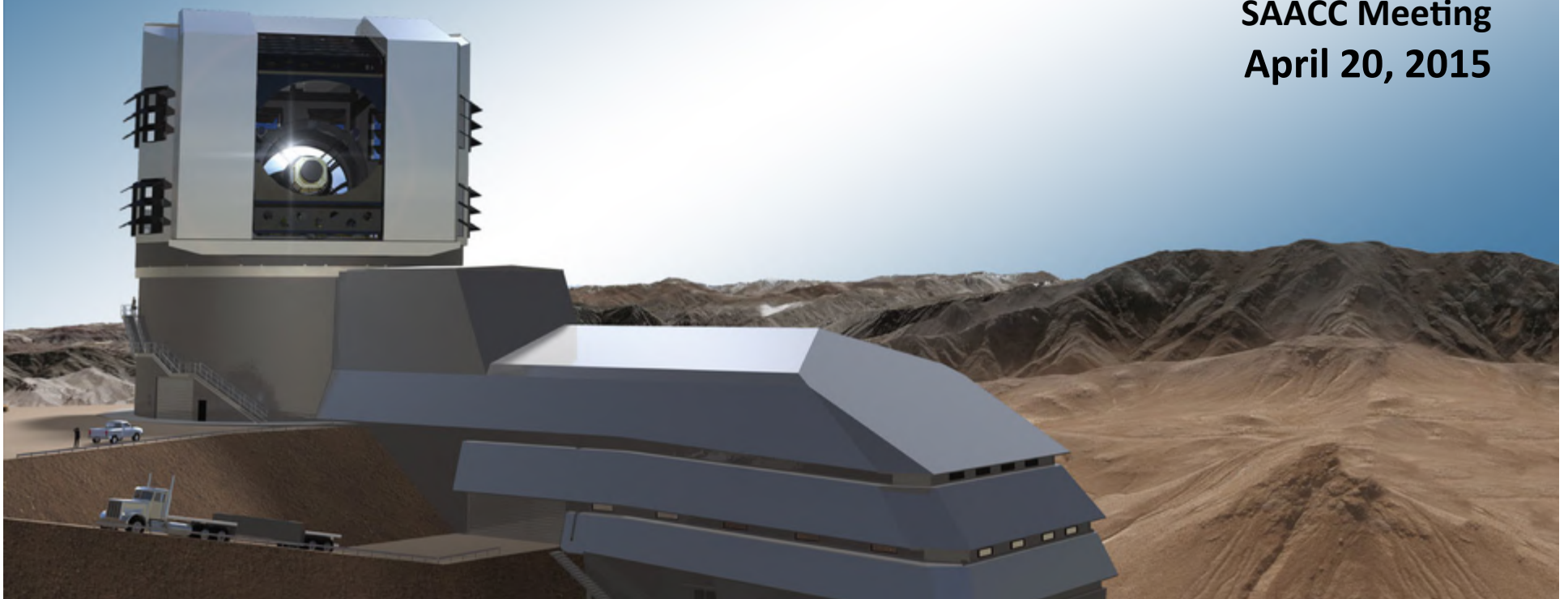


LSST Project Update

Jeff Kantor
LSST Data Management Project Manager

SAACC Meeting
April 20, 2015



LSST: A Deep, Wide, Fast, Optical Sky Survey



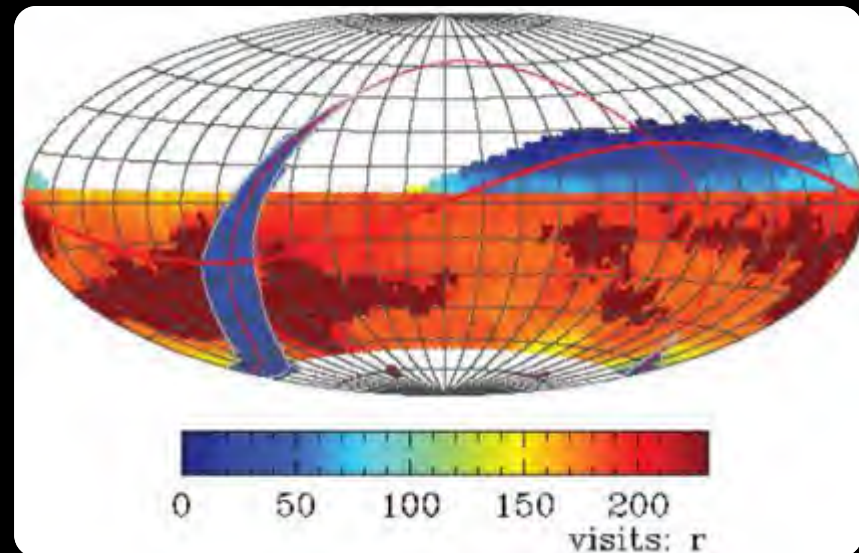
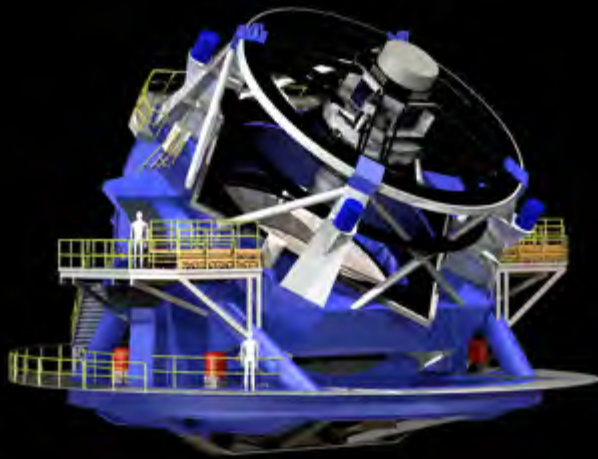
8.4m telescope

optical (ugrizy)

0.5-1% photometry (sys)

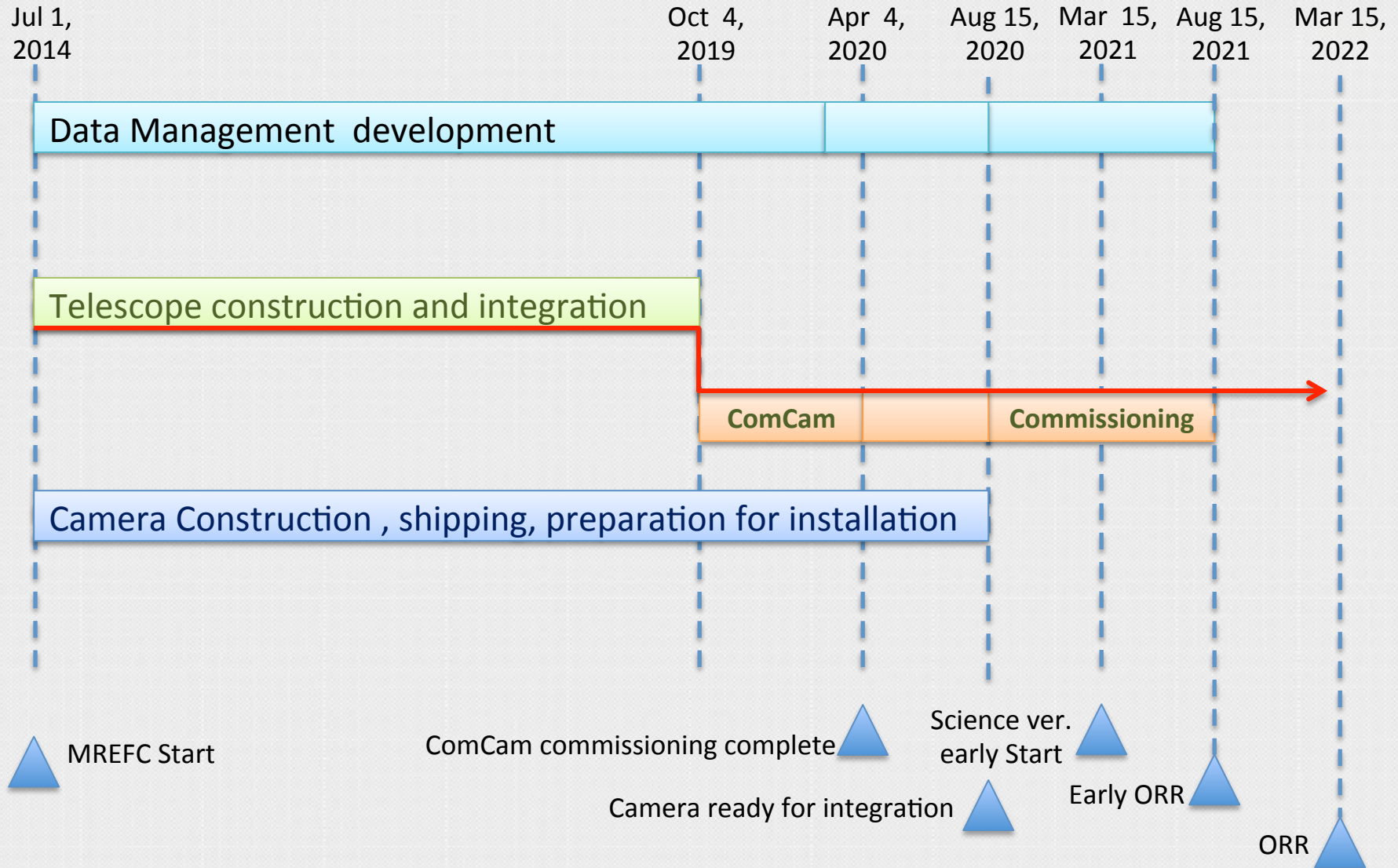
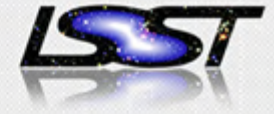
3.2Gpix camera

2 x 15sec exp / 2sec read



Location: Cerro Pachon, Chile
Construction Start: July 2014

Integrated Schedule key milestones



Data Management Sites and Centers



HQ Site HQ Facility

Observatory Management
Science Operations
Education and Public Outreach



Archive Site Archive Center

Alert Production
Data Release Production
Calibration Products Production
EPO Infrastructure
Long-term Storage (copy 2)
Data Access Center
Data Access and User Services

French Site Processing Center

Data Release Production
(proposed)



Base Site Base Facility

Long-term storage (copy 1)
Data Access Center
Data Access and User Services



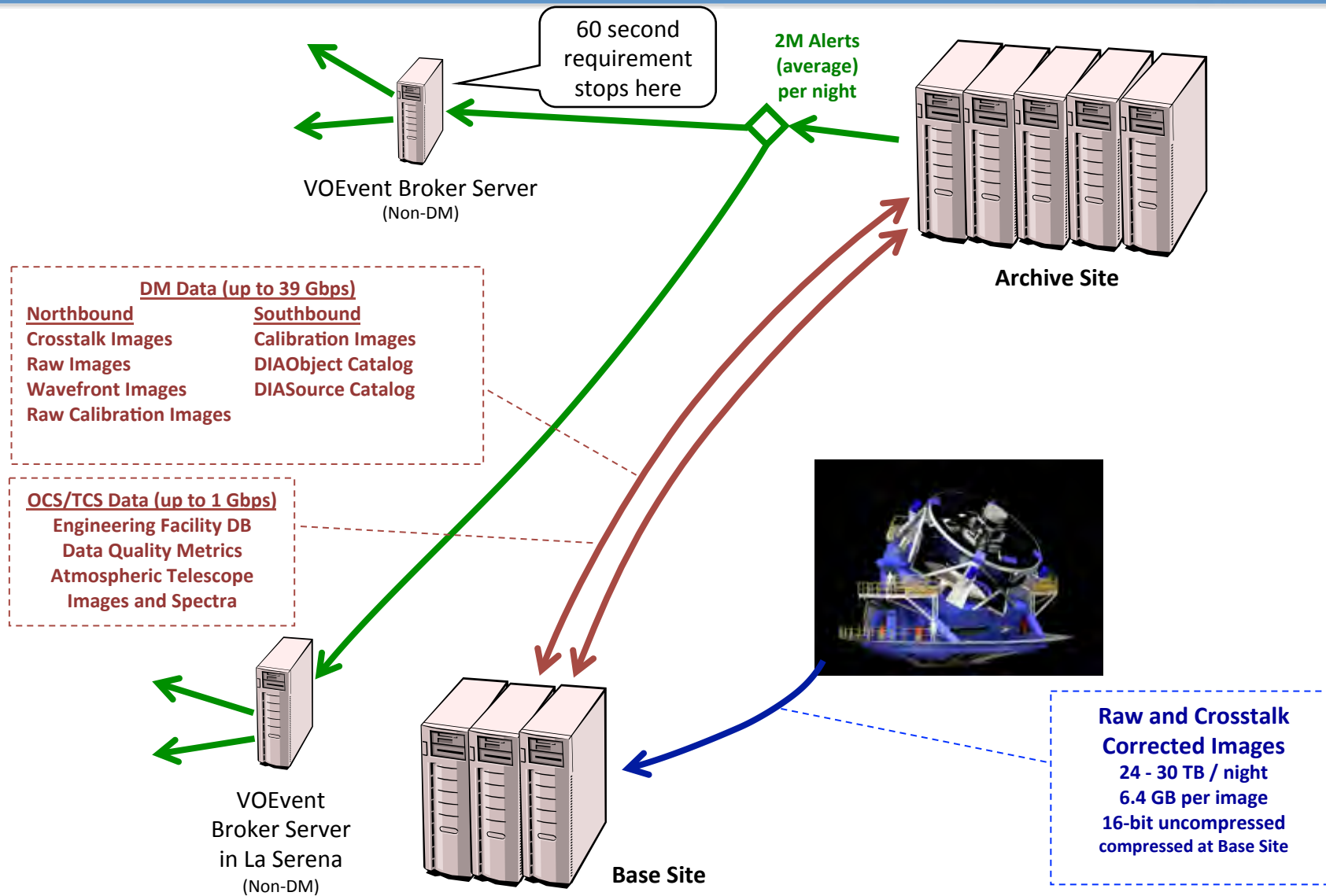
Summit Site Summit Facility

Telescope and Camera
Data Acquisition
Crosstalk Correction

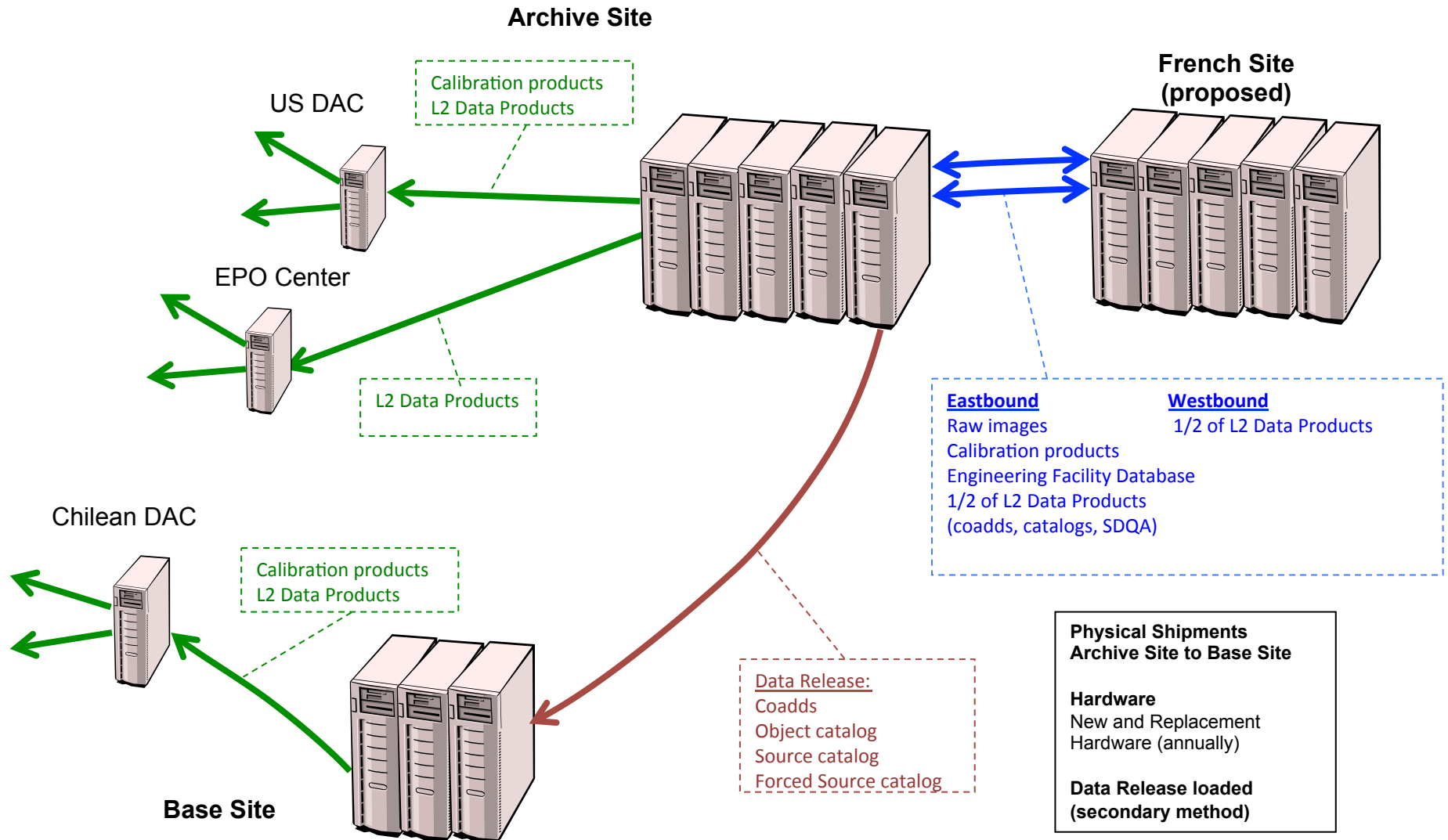




Nightly International Data Flows



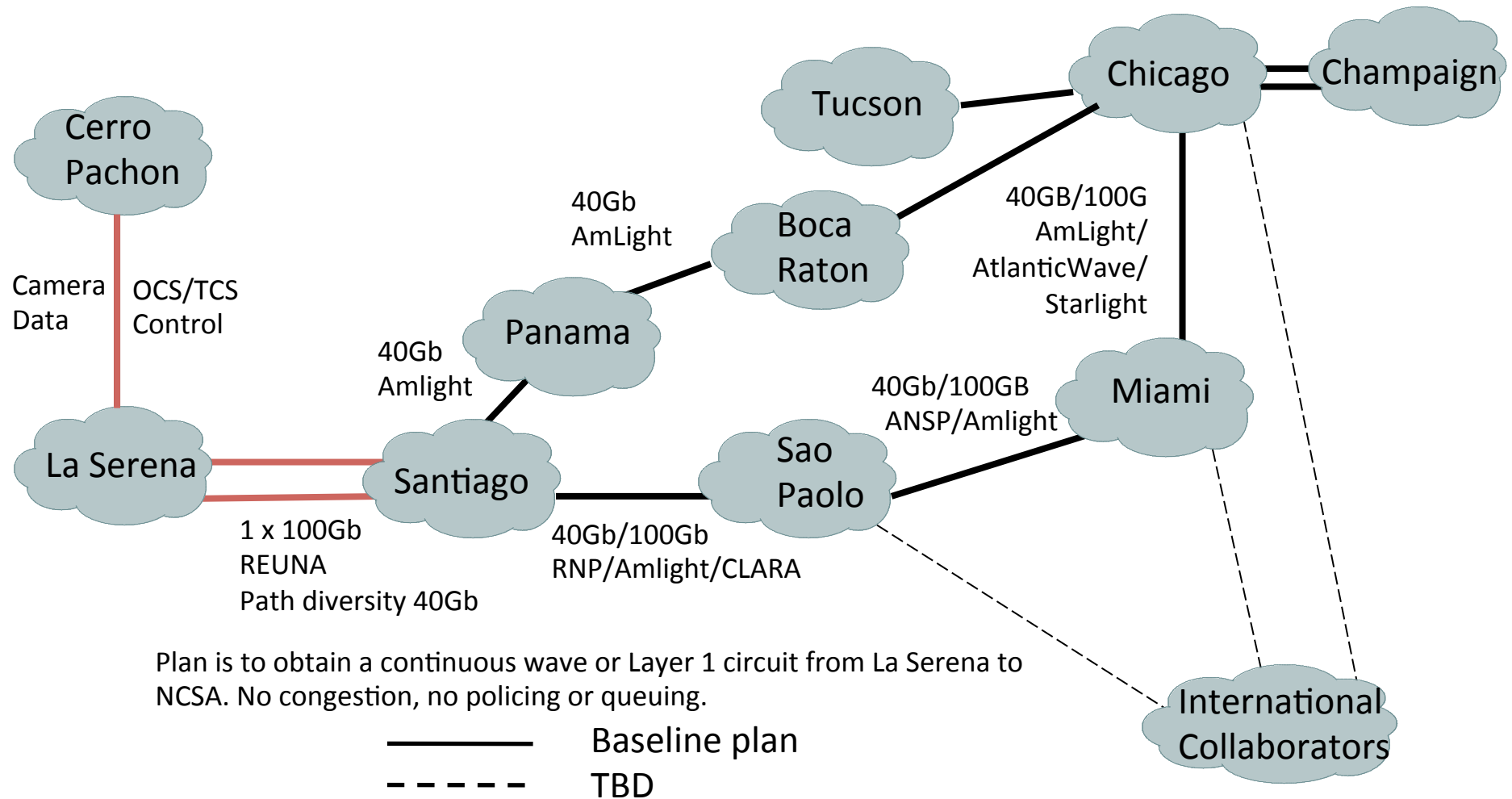
Non-Nightly International Data Flows





LSST Long Haul Network Links (Current Design)

2 * 40GB/100GB
NCSA/Iwire



BASELINE ALLOCATION OF BANDWIDTH



SUMMIT TO BASE

ALLOCATED BANDWIDTH

Crosstalk corrected images within 1 seconds	100Gb
TCS/OCS command and control	100Gb

BETWEEN BASE AND ARCHIVE

Crosstalk in 5 seconds	40Gb
Raw data 24 hours	
Data Releases once a year	40Gb
Operational traffic	10Gb

CHILEAN OPORTUNISTIC TRAFFIC

As available



- Segment 1: “Mountain-Base” (Managed by REUNA/AURA)
 - From Cerro Pachon to La Serena computing facility, 2 x 100 Gbs (plus 100Gbps AURA shared)
 - Actually broken down into two sub-segments:
 - Summit-Gatehouse (on AURA property) = 30km
 - Gatehouse-La Serena (on public line) = 55km
- Segment 2: La Serena-Santiago (Managed by REUNA)
 - From La Serena computing facility to (TBD) connection point in Santiago with international links
 - with diverse path
 - 200Gbs best case, 100Gbs likely, 40Gbs worst case



- Segments 3 : International links
 - **Provided by Amlight/RNP/CLARA**
 - Santiago – Sao Paolo – Miami east coast
 - Baseline: 40Gbps
 - Current goal: 100 Gbps link
 - Santiago – Panama – Boca Raton west coast
 - Baseline: 40Gbps
 - Current goal: 40 Gbps link baseline

- Segment 4: US links
 - Utilizing Internet-2 and ESnet
 - at 100Gbps

Proposed Bandwidth timeline: LDM-142



FISCAL YEAR	R&D	Construction					Commissioning			Operation
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Mountain - Base	0	0	0	AURA 100	200	200	200	200	200	200 best case [1] 100 likely case 40 worst case
Base - Santiago	1	1	1	4	4+100	4+100	40+100			100 best case [1] 40 likely case 10 worst case
Santiago - Miami	1	1	1	10	100	100	100			100 best case [1] 40 likely case 10 worst case
Miami - Chicago	1	1	1	10	10	10	10			100 best case [1] 40 likely case 10 worst case
Chicago - Archive	1	1	1	1.5	2	100	100			100 best case [1] 40 likely case 10 worst case
Santiago - Boca Raton	1	1	1	1	40	40	40			100 best case [1] 20 likely case 10 worst case
Boca Raton- Chicago	0	0	0	0	0	0	0			100 best case [1] 20 likely case 10 worst case
Chicago -Lyon	0	10	10	10	10	10	10			100 best case [2] 20 likely case 10 worst case
Chicago - Tucson	0	0	0	0	0	0	0			100 best case [1] 20 likely case 10 worst case

NOTES:
 All bandwidths are in gigabits/second (Gb/s)
 Bandwidths are guaranteed minimum available
 All allow burst up to unused capacity
 [1] best/likely cases presumes continued IRNC, International REN investments, and industrial partnerships through AMPATH/AMLIGHT
 likely case presumes only continued IRNC investment, worst case assumes only LSST support.
 [2] This is proposed. IN2P3 provides this and will match the other links in capacity to the degree possible.
 [2] This is proposed. IN2P3 provides this and will match the other links in capacity to the degree possible.

LSST MREFC Funding Status



- NSF signed Cooperative Agreement for LSST to proceed with Construction, effective July 1, 2014!
- One Contract with REUNA signed, others pending; FIU/AmLight are under development
- Staff is ramping up across Data Management, tripling in size in FY15 – FY17



The long awaited news has arrived – LSST has received its federal construction start! On Friday afternoon, August 1, the NSF authorized the LSST project for construction with \$27.5M in FY14 and a budget plan that stays within a \$473M overall budget cap. [AURA received NSF support to manage construction of LSST; the NSF press release describes LSST construction as “taking astronomy to the next level”. This marks the official federal start of the LSST project.](#)

LSST First Stone, 14 April 2015



So I am here, what can I say, so proud as President of Chile, from Cerro Pachón, in the district of Vicuña, working for the next decade of world science. With this foundation stone, today we are setting in motion the history of astronomy, the future history of astronomy.

President Michelle Bachelet