LARGE SYNOPTIC SURVEY TELESCOPE

Large Synoptic Survey Telescope (LSST)
Telescope & Site

Control Software Architecture

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LSE-150

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Abstract

TSS Architecture and approach.

Change Record

Version	Date	Description	Owner name
1	2012-12-14	V1	German Schumacher
	2019-01-20	Unreleased.	William O'Mullane, Tim Axelrod

Contents

Control Software Architecture

1 Introduction

The LSST Control Software contains the overall control aspects of the survey and the telescope including the computers, network, communication and software infrastructure. It contains all work required to design, code, test and integrate, in the lab and in the field, the high level coordination software.

2 System Architecture

The control system architecture is a relatively flat DDS message based system using multi cast messaging. A high level view is given in Figure 1

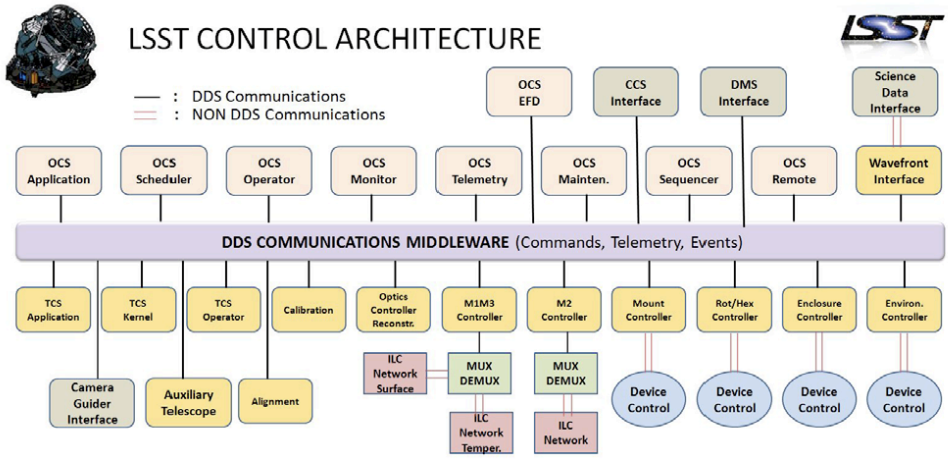

FIGURE 1: High Level Architecture Diagram

Broadly this may be seen as comprising:

- Infrastructure and Middleware :
  - Service Access Layer (SAL) based on DDS
  - Engineering and Facility Database (EFD)

  - Operator Interface (based on LOVE)
  - Script Queue [1]
  - Python Scripting based on SalObj[2]

- The Scheduler [3]
- Potentially an Auxiliary and Main Telescope Control System (ATCS and TCS)[4]
- Controllable SAL Components (CSCs) - every device and some pseudo devices, including the scheduler, are CSCs. Some are coordinating other CSCs, the full hierarchy is shown for AuxTel in Figure 2 and the Main Telescope in Figure 3

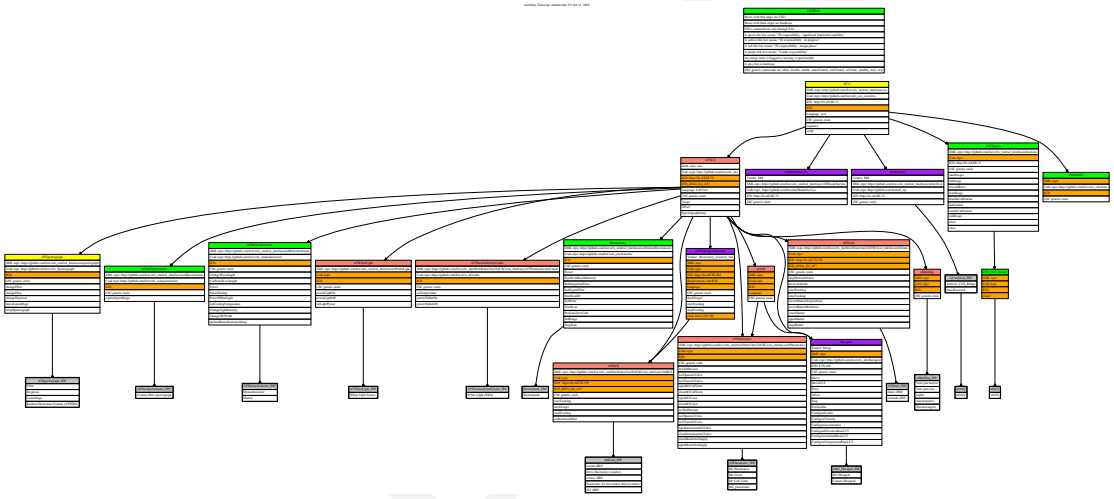

FIGURE 2: Complete set of AuxTel CSCs

A References

References

B Acronyms used in this document

[1] https://github.com/lsst-ts/ts_scriptqueue
[2] https://github.com/lsst-ts/ts_salobj
[3] https://github.com/lsst-ts/ts_scheduler
[4] The precise nature and need for these is unclear now so they have lower priority.

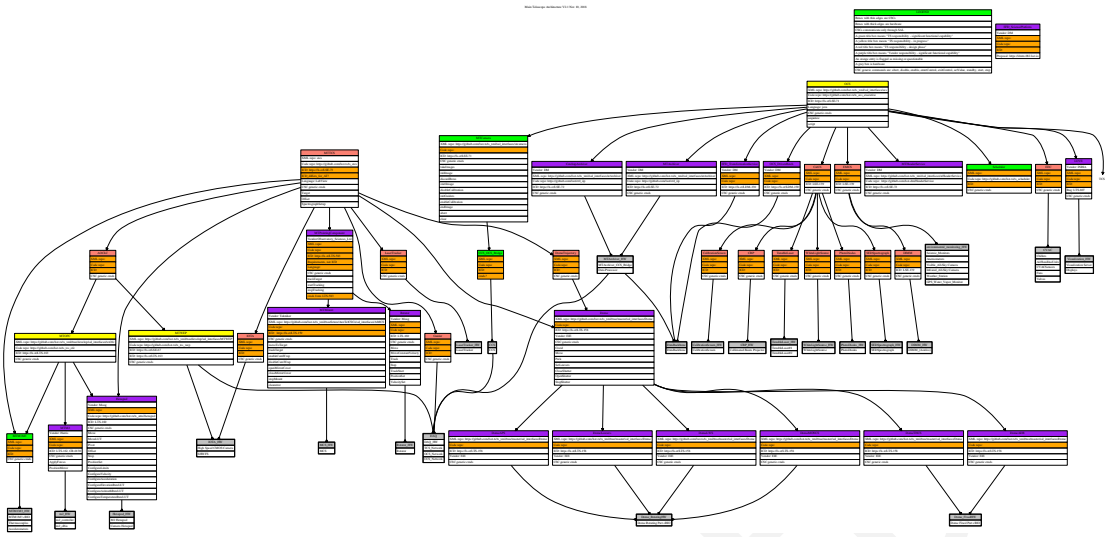

FIGURE 3: Complete set of Main Telescope CSCs

Acronym	Description
AT	Astrophysical Transient
AT	Average Tilt
ATCS	Auxiliary Telescope Control Sys stem
DDS	Data Disposition System
EFD	Engineering Facilities Database
LOVE	LSST Operations Visualization Environment
LSE	LSST Systems Engineering (Document Handle)
LSST	Large Synoptic Survey Telescope
SAL	Services Access Layer
TCS	Thermal Control Sub-system
TS	Test Specification
TSS	Telescope and Site Software