NGC OPTICAL SOFTWARE

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- **"Exposure" handling**
  - **Optical**

    Rigid scheme for exposures (*wipe - integrate - ["move charges on detector while integrating"] - read*).

    Active intervention of the control-server during the exposure is required (application of new voltages in each state).

    "Active" interface to different kinds of shutter controllers (open/close, status check, open/close delays, etc.).

  - **Infrared**

    Detector continuously read-out (infinite loop).

    Starting an exposure = starting transfer and storage of data. Once exposure is started, control server mainly reacts passively on incoming data-frames.

    No "active" interface to external devices (interfaces through trigger signals, e.g., for *nodding*).

❑ **Data handling**

➢ **Infrared**

Computationally intensive different data pre-processing, read-out mode dependent.

➢ **Optical**

Detector read-out just once at the end of an exposure. The only processing to be done is pixel sorting and offset calibration (centroiding and bias-subtraction on request).
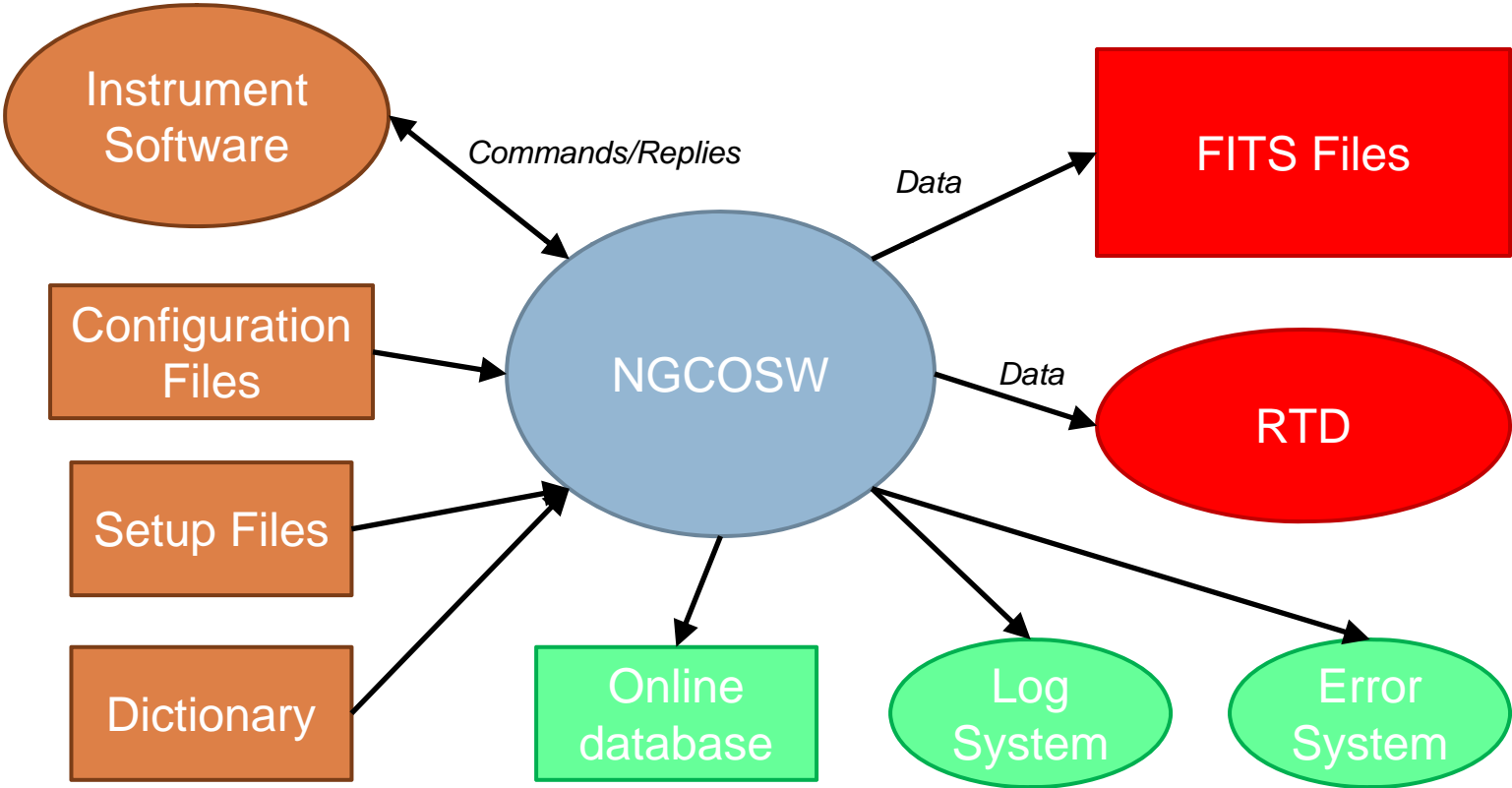
❑ optical detector controllers are requested to interface/control also devices which are not – strictly speaking - part of the detector, like vacuum and temperature control (and write values in FITS file header)
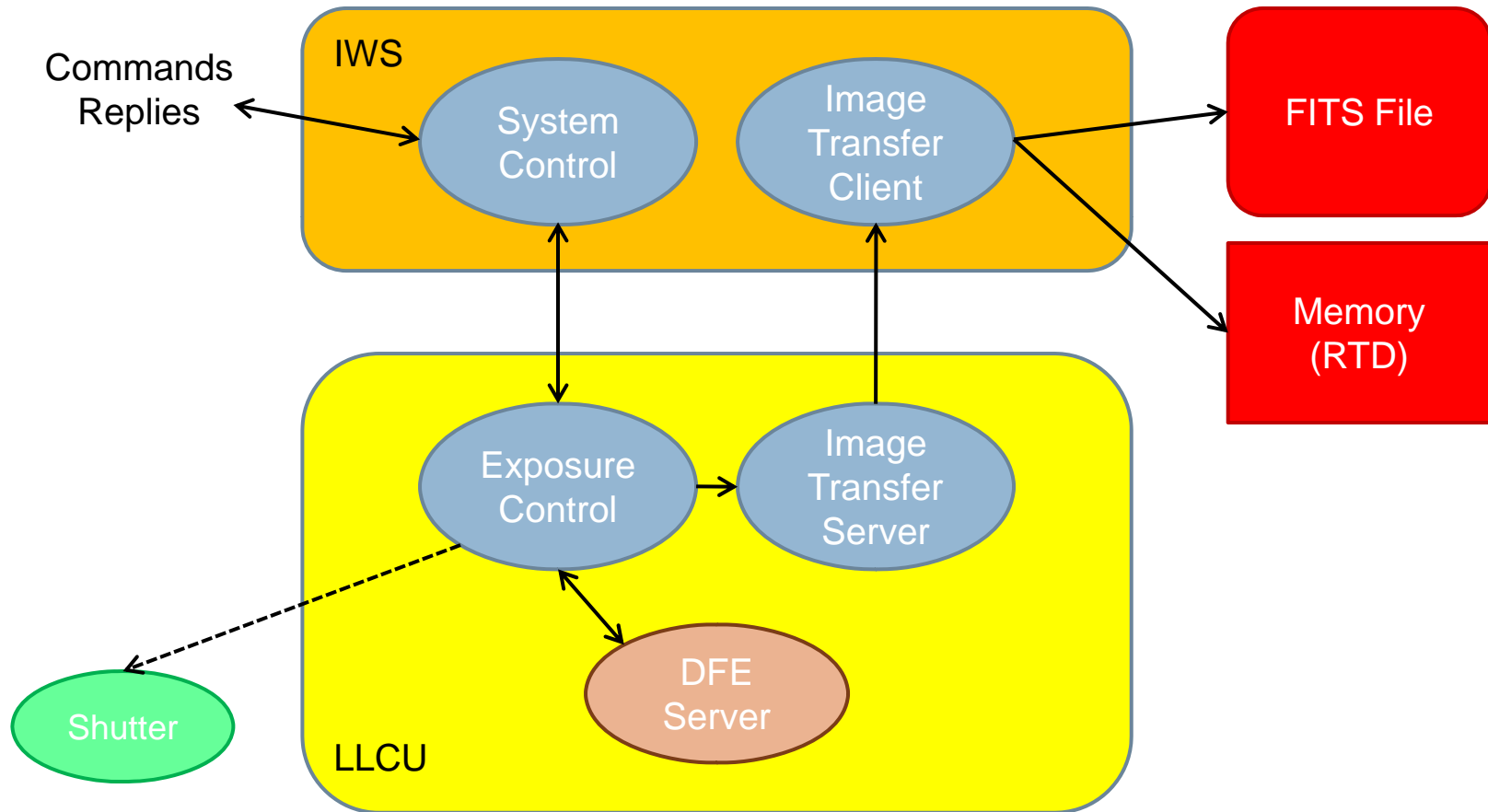
➢ Base software common to Infrared and Optical detectors to interface the hardware (thanks Joerg)

➢ At higher level:
NGCIRSW and **NGCOSW**

NGC Software Environment

Instrument Software

Configuration Files

Setup Files

Dictionary

NGCOSW

Commands/Replies

Data

Data

FITS Files

RTD

Online database

Log System

Error System

NGCOSW Processes

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IWS

Commands
Replies

System
Control

Image
Transfer
Client

FITS File

Memory
(RTD)

Exposure
Control

Image
Transfer
Server

Shutter

DFE
Server

LLCU

Operational Modes

- **Normal mode**: the NGC detector electronics is connected.

- **Hardware-Simulation mode**: the NGC detector electronics is simulated.

  - The FIERA LCU-Simulation mode is equivalent to Hardware-Simulation.

  - The NGCOSW can either be distributed on both the IWS and the NGC LLCU or run completely on one of the two platforms.

- **Exposure Modes** define the set of voltages, clock patterns and sequences to be applied to the different "steps" of an exposure (wipe, integrate, read).
- Same approach of FIERA
- Exposure Modes are defined in the detector Configuration File (different for each instrument)
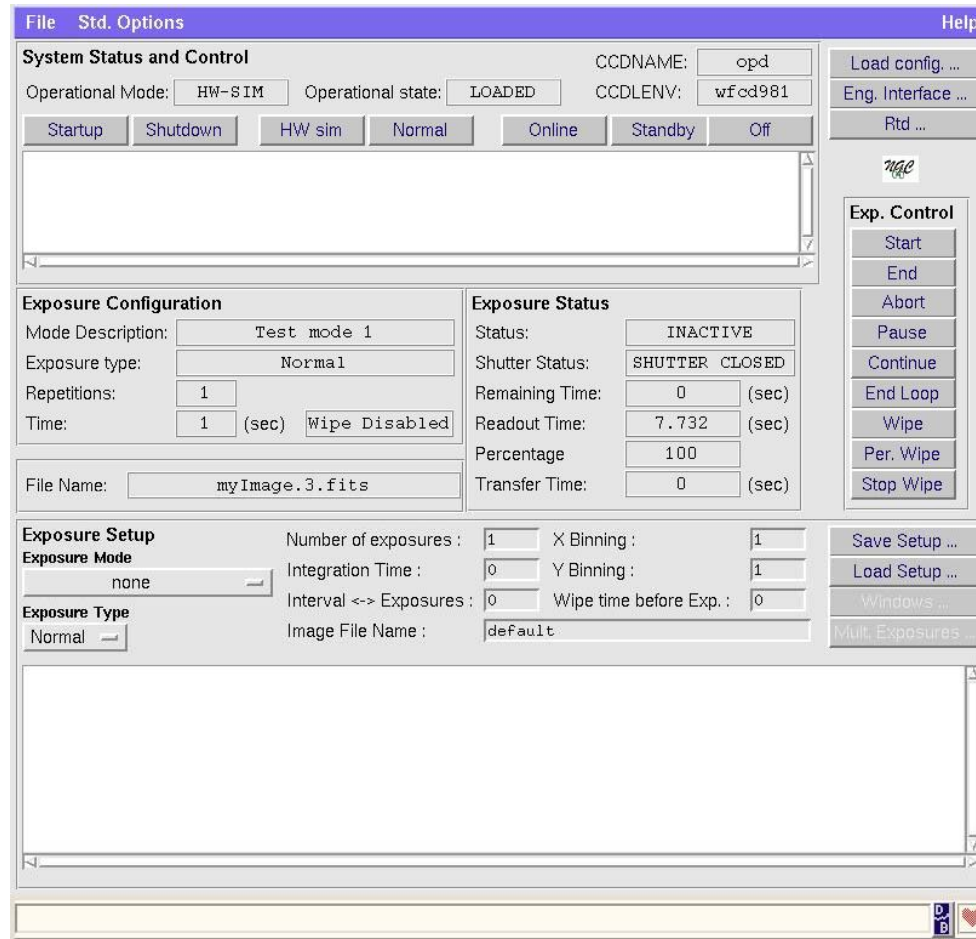
3 options under discussion:

- Via NGC LLCU serial port (à la FIERA)
- Via standard LCU (à la IRACE)
- Via Serial-to-ethernet adapter

NGCOSW Graphical User Interface

NGCOSW code

- NGCOSW code generated using the wsf (workstation software framework) tool developed by SDD

- See: Andolfato L., Karban R., "*Workstation Software Framework*", article for SPIE 2008 "*Astronomical Telescopes and Instrumentation*" Conference, Marseille, Jun 23-28, 2008

Documentation

Cumani C., Balestra A.

"NGC – Optical DCS – User Manual"

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