aLIGO Guardian
Synopsis and Status Update

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Overview

Guardian is the aLIGO automation system.

It will manage the state of the interferometers by coordinating state transitions of all interferometer subsystems. The primary tasks are:

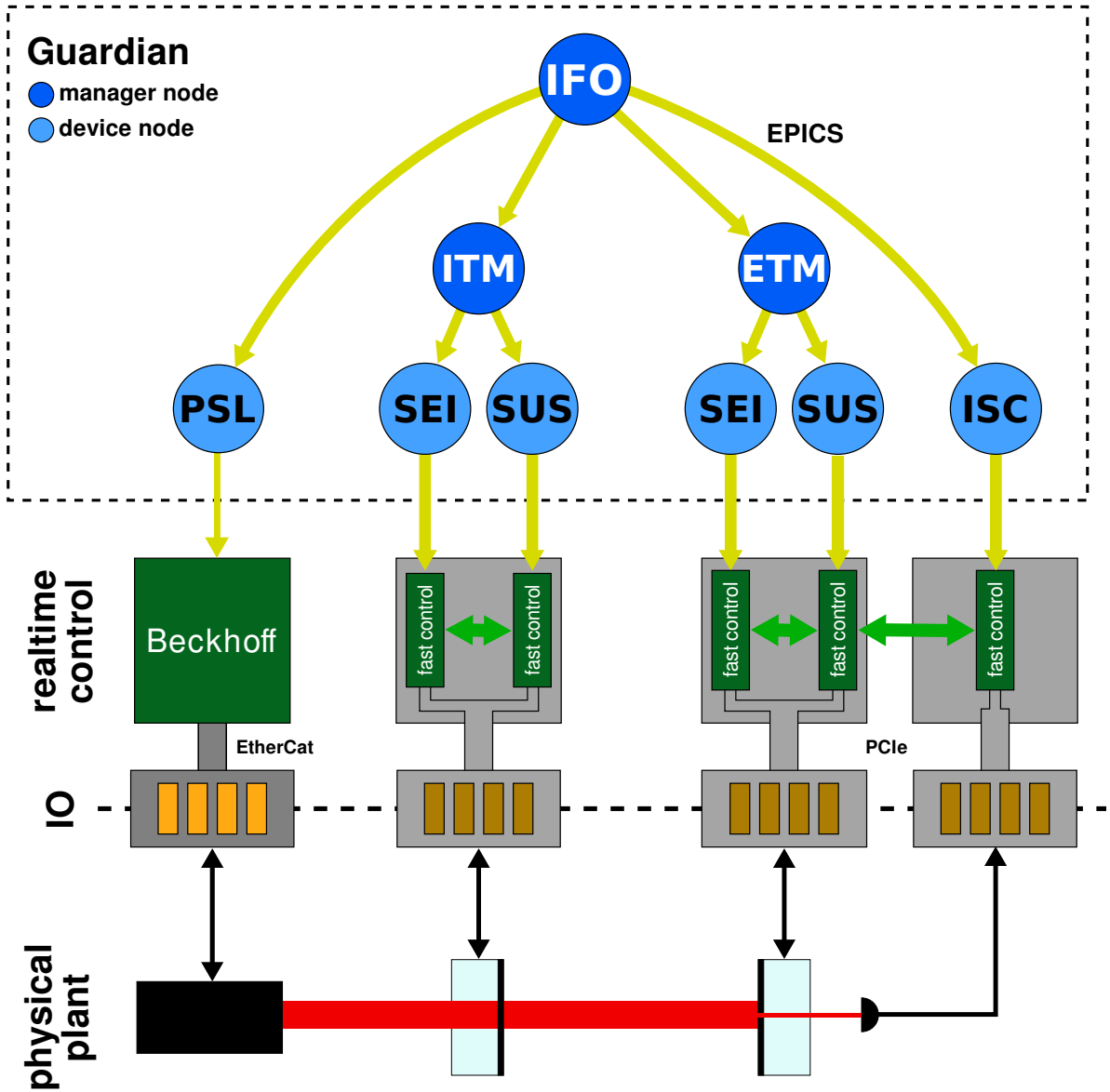
- full interferometer lock acquisition and recovery from lock loss
- monitor interferometer state, recovering from undesirable deviations where possible and alerting operators otherwise
- aid commissioning

Global automation is structured as a hierarchy of individual guardian processes (nodes), each handling control of a particular domain of the interferometer.

Overview

Top level manager nodes control lower level subordinates, down to device nodes that talks directly to the RTS front-ends and Beckhoff.

A single IFO manager sits at the top, accepting state requests for the entire interferometer.



Overview

Nodes are programmed as *state machines*. Nodes accept state requests from above, and analyze their state graphs to determine how to reach the requested state.

All interaction is done via EPICS, both between nodes and between the RTS and Beckhoff front ends:

- device nodes read and control states of front ends
- managers request and monitor state of their subordinates

All request and status channels for all nodes will be recorded in frames.

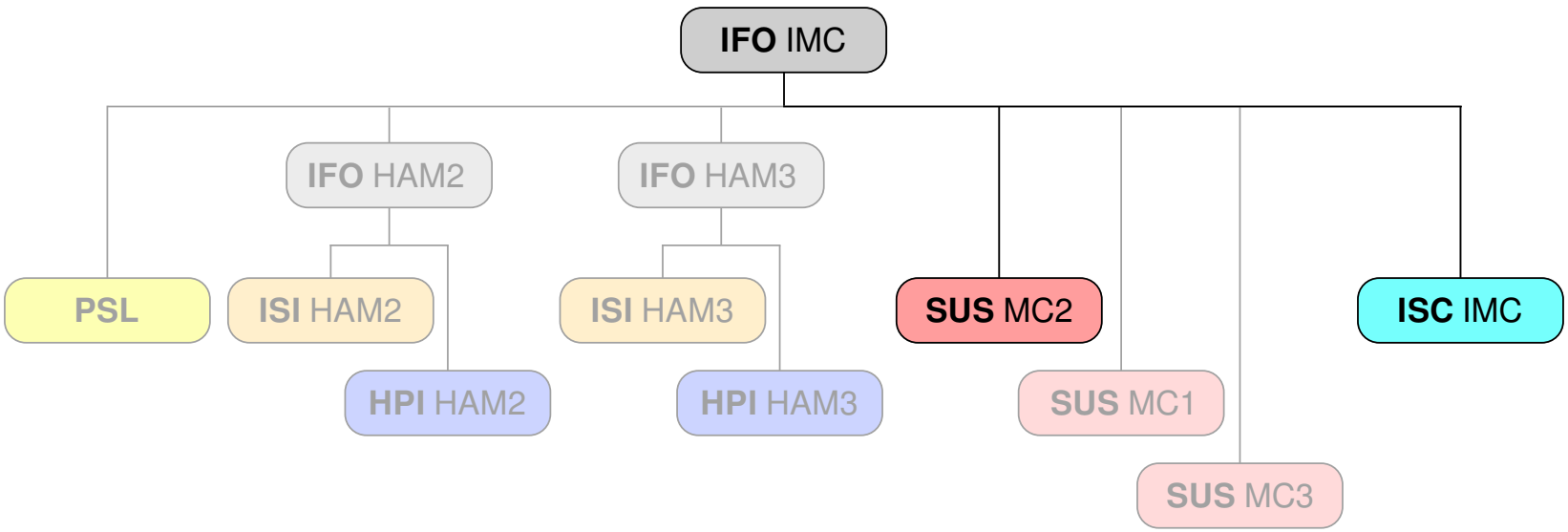
Status

Guardian infrastructure fully deployed at LHO.

LHO input mode cleaner (IMC) under guardian control. This currently includes three guardian nodes:

- `IFO_IMC`: IMC manager
- `ISC_IMC`: ISC component of IMC control
- `SUS_MC2`: MC2 suspension (IMC actuator)

with more to come...



Ahead

- add SUS MC1 and MC3 under LHO IMC manager
- deploy Guardian infrastructure and IMC control at LLO (January 2014)
- commission ISI and HPI guardians (in progress)
- top-level IFO manager and PRMI and DRMI locking
- integrate ALS (Beckhoff)
- full IFO locking