

Gen2 Technical Overview

Eric Jeschke

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with

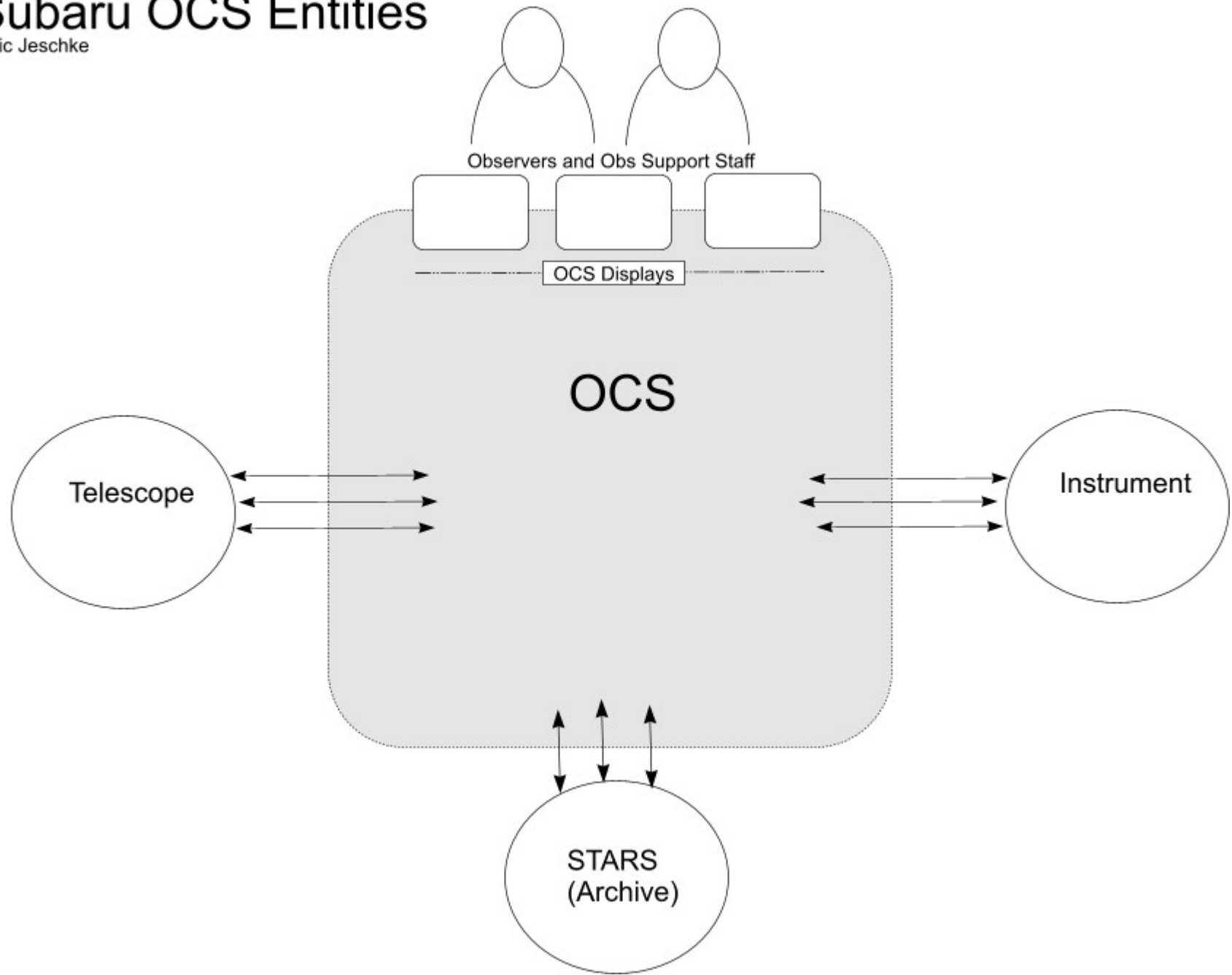
Inagaki T., Streeper S., Tomono D., Terada H., Takami H.

Outline

- Overview
- Goals
- Software Architecture
 - Phase 1
 - Example: Monitoring
 - Phase 2
 - Compatibility Mode
 - Phase 3
- Hardware
- Roadmap
- Questions

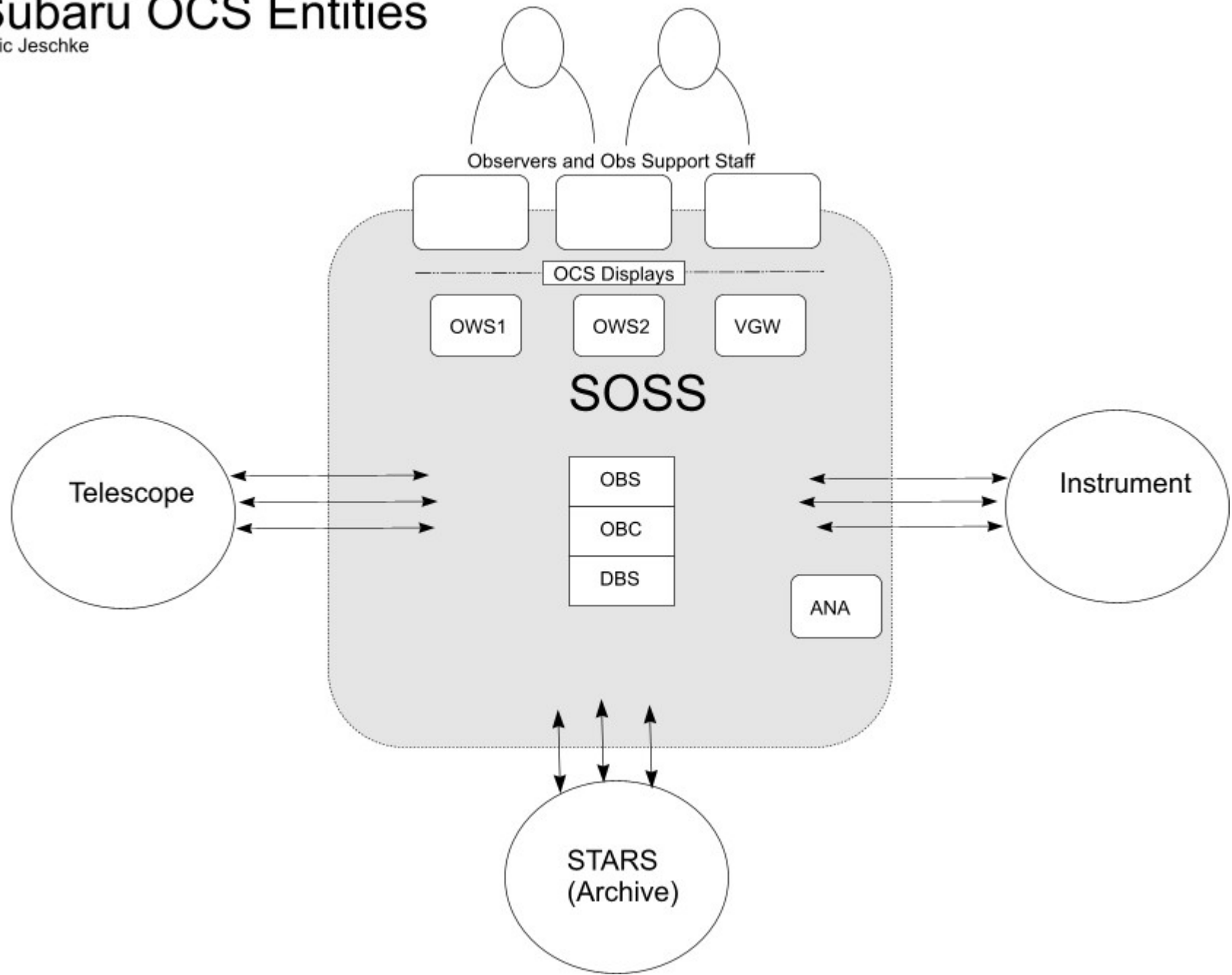
Subaru OCS Entities

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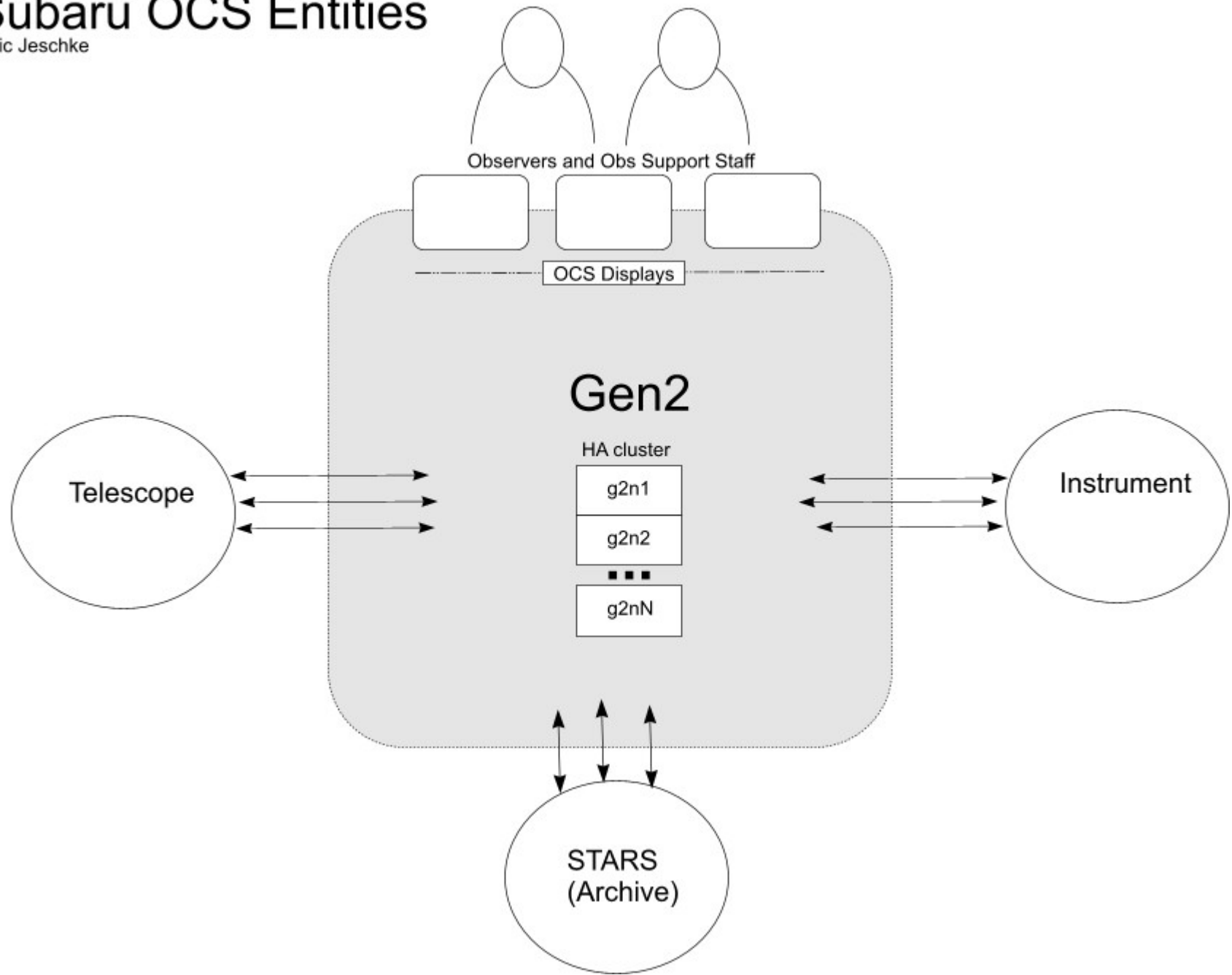
Subaru OCS Entities

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Subaru OCS Entities

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Goals for Gen2 OCS (Observers & Obs Support Staff)

- Improved language & tools for writing observation tasks
- Improved graphical user interfaces for observation
- Clear, simple and transparent monitoring of command execution
 - WHAT is happening, WHERE and WHEN
- Good documentation
- Portable version for training, simulation & instrument development
- Reliable operation & simplified troubleshooting
- ??? (***your opinion here***)

Goals for Gen2 OCS (Developers & Support Staff)

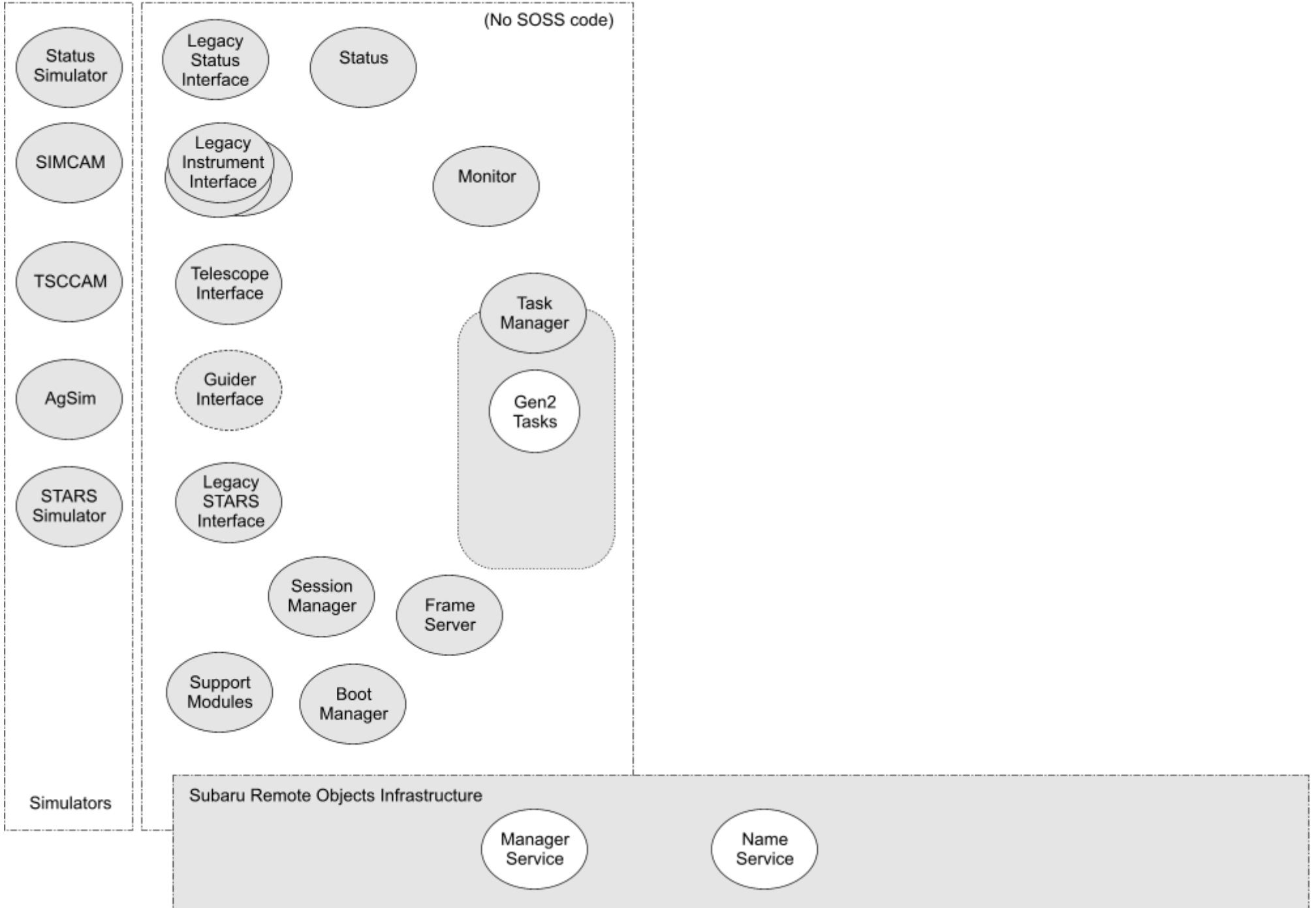
- Flexible software design for future modifications and astronomer workflows
- Automated, comprehensive regression tests
- Software version control and simple upgrade/downgrade procedure
- Simple, centralized logging and monitoring
- Good fault-tolerance (resistance to failure) via graceful failover or simple reconfiguration
- Simple start up, shut down, troubleshooting
- Simple maintenance

Gen2 Software Diagram

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Phase I

Gen2 Back Ends (Servers)

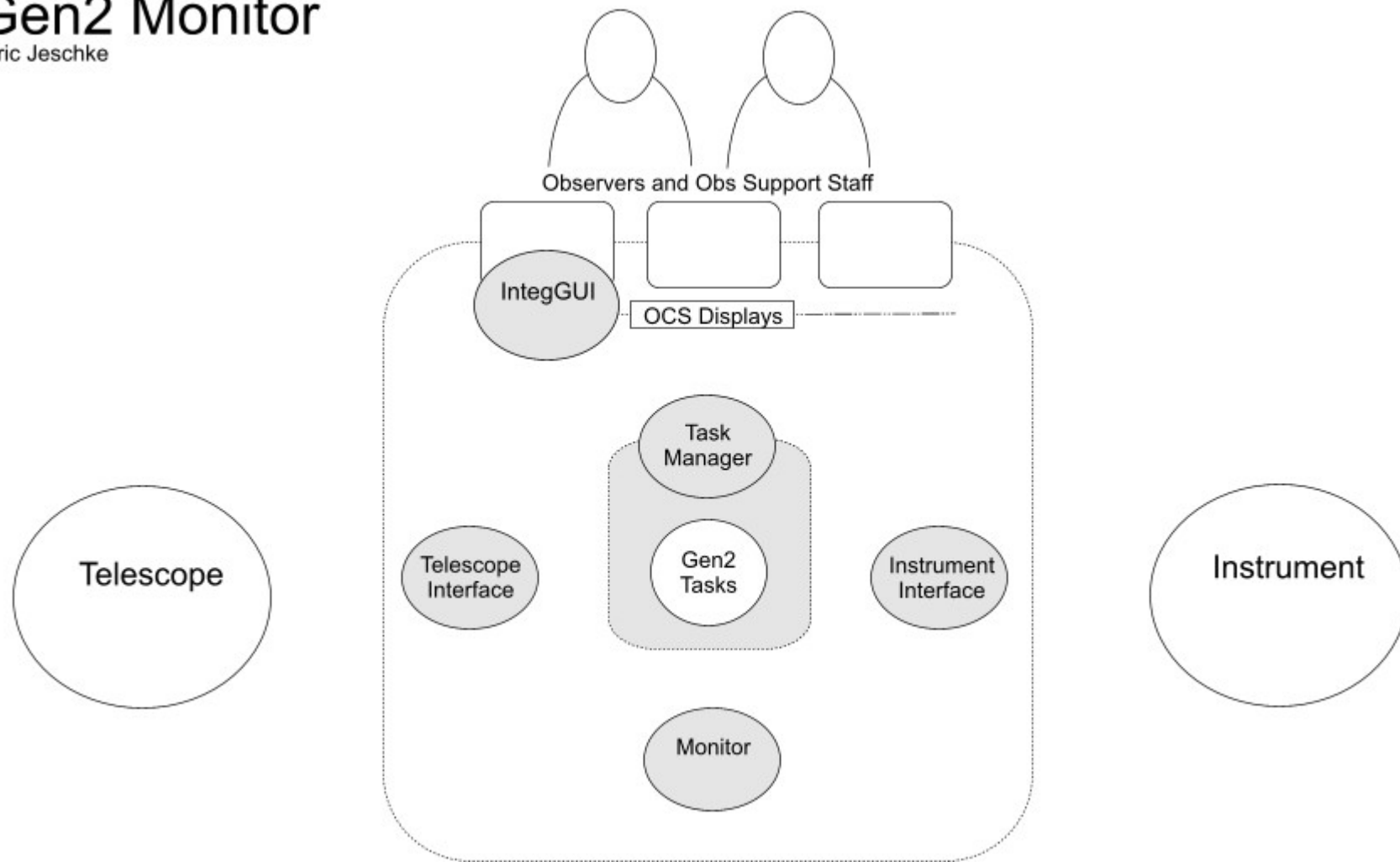


Example: Monitoring

- Need to know what is happening: what commands, what subsystems
- Lesson from current OCS: need both “birds eye view” and detail (if wanted)
- Architecture of Gen2 is designed to facilitate centralized reporting via the *Monitor* (a kind of shared, high-bandwidth bulletin board)

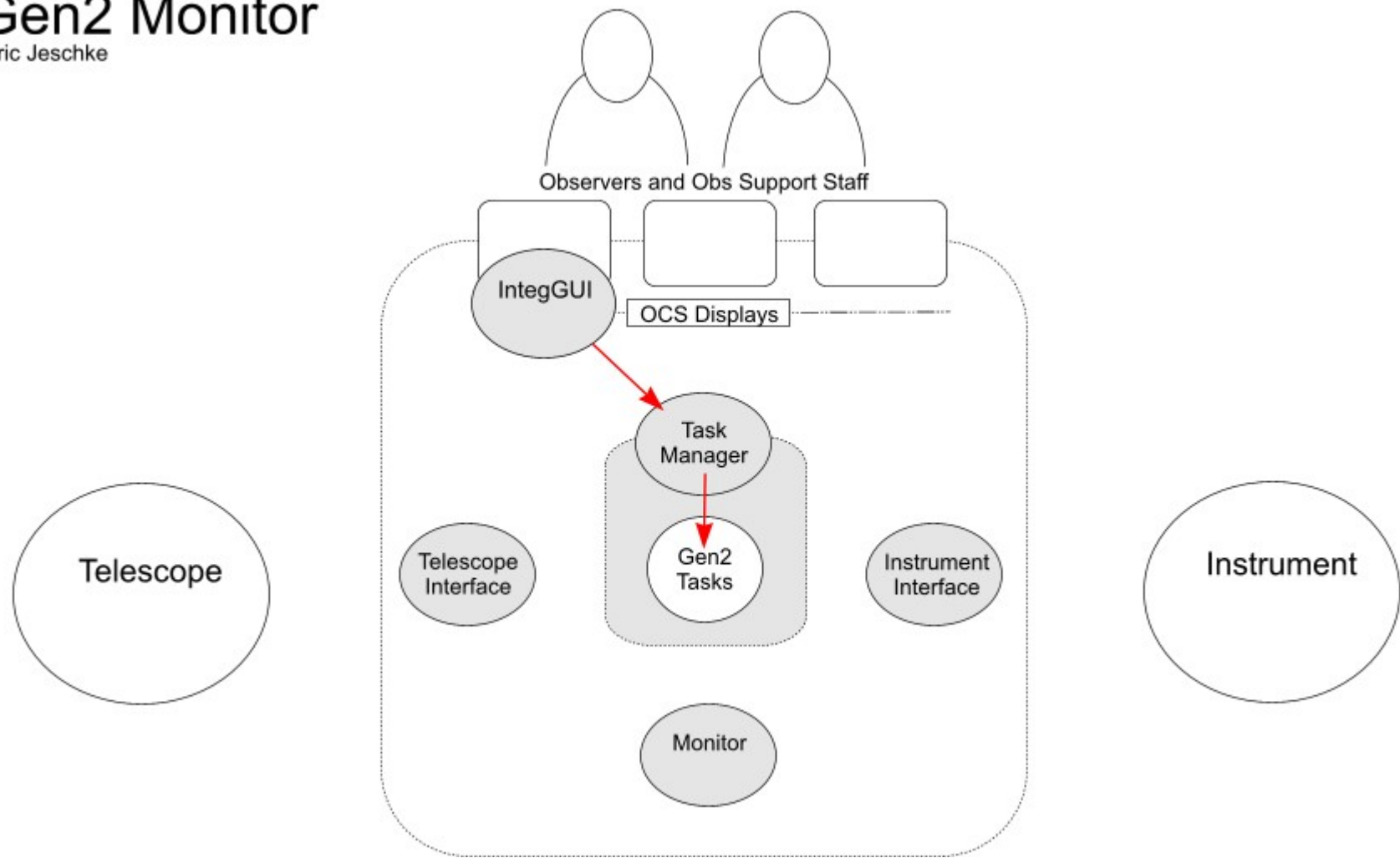
Gen2 Monitor

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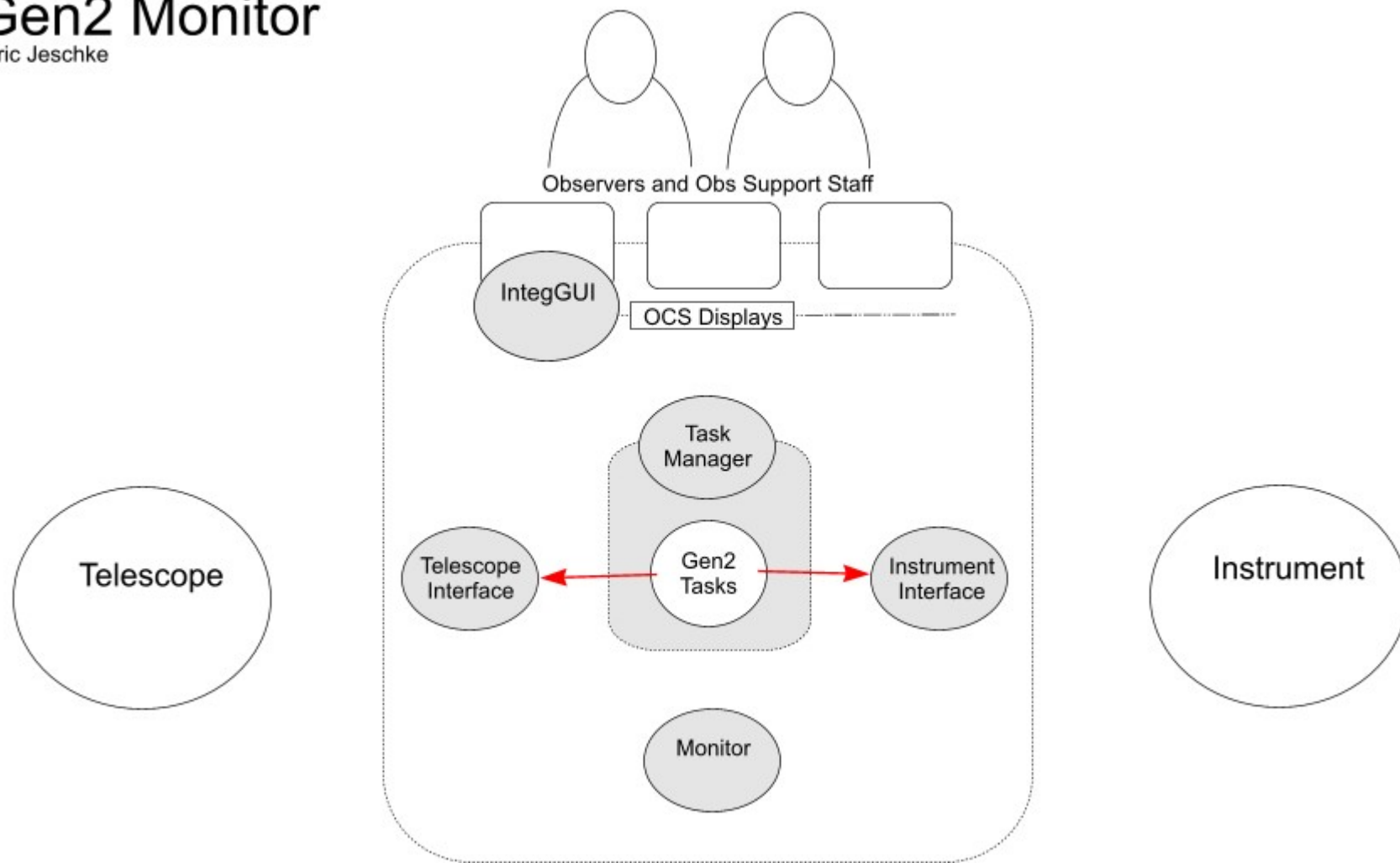
Gen2 Monitor

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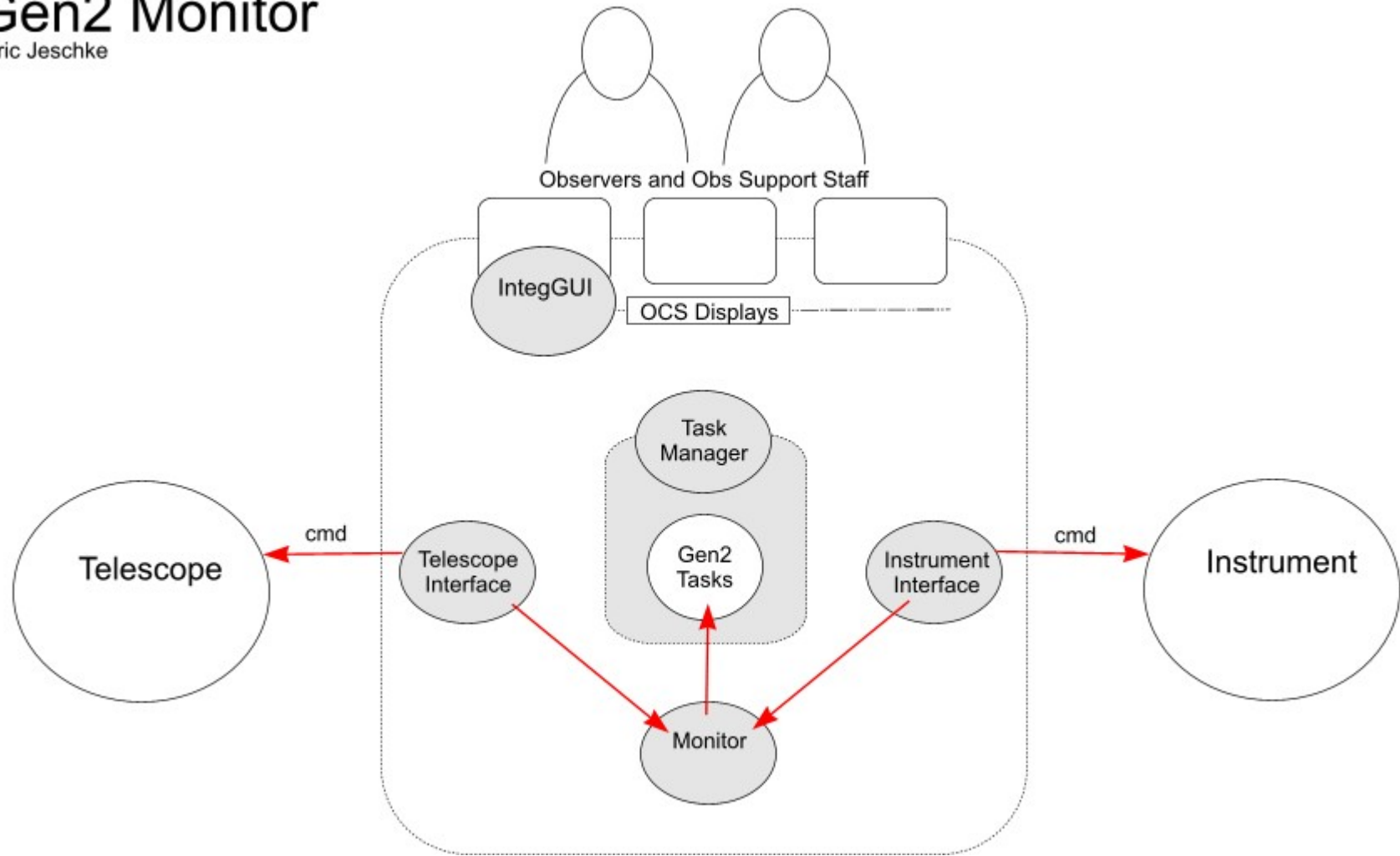
Gen2 Monitor

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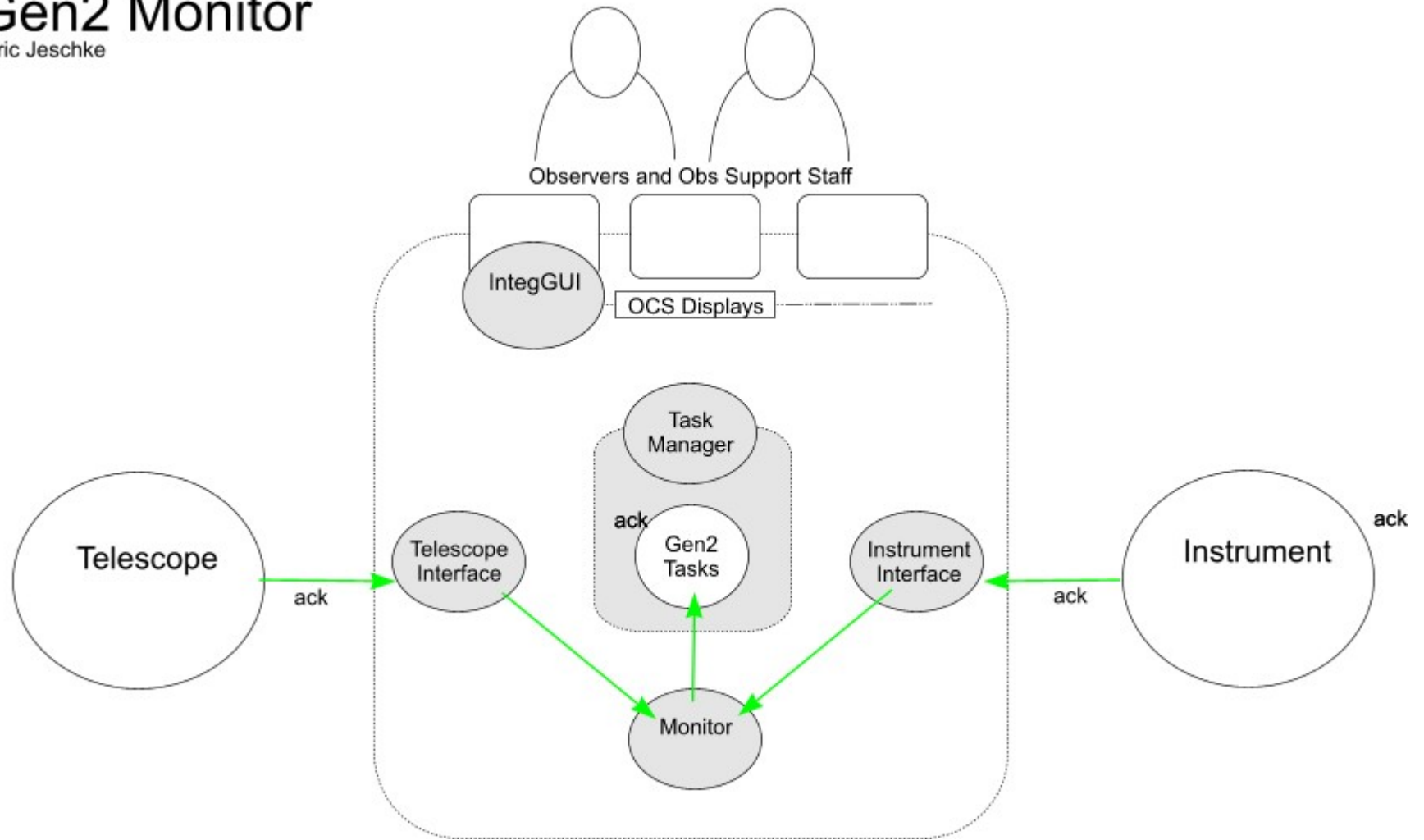
Gen2 Monitor

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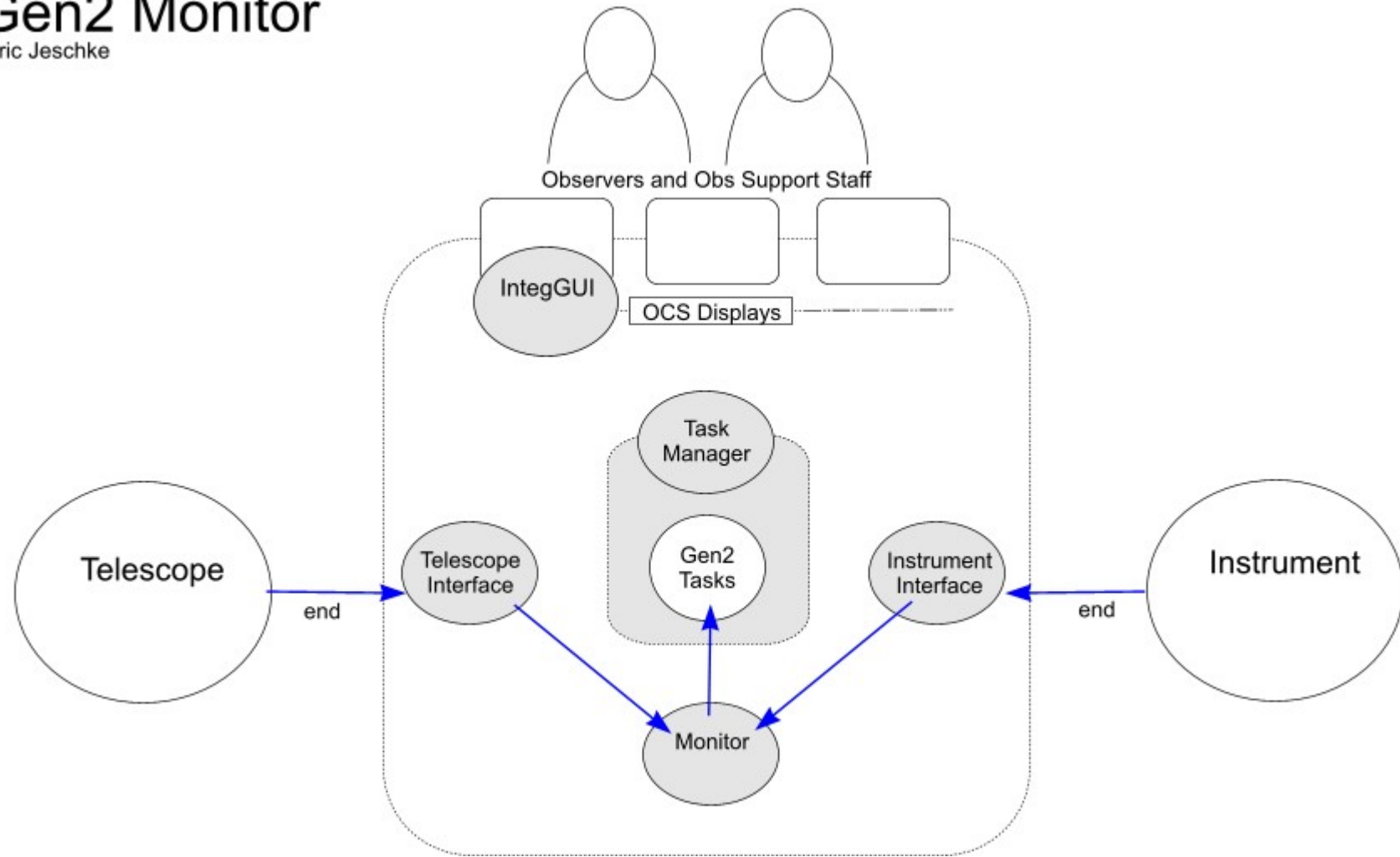
Gen2 Monitor

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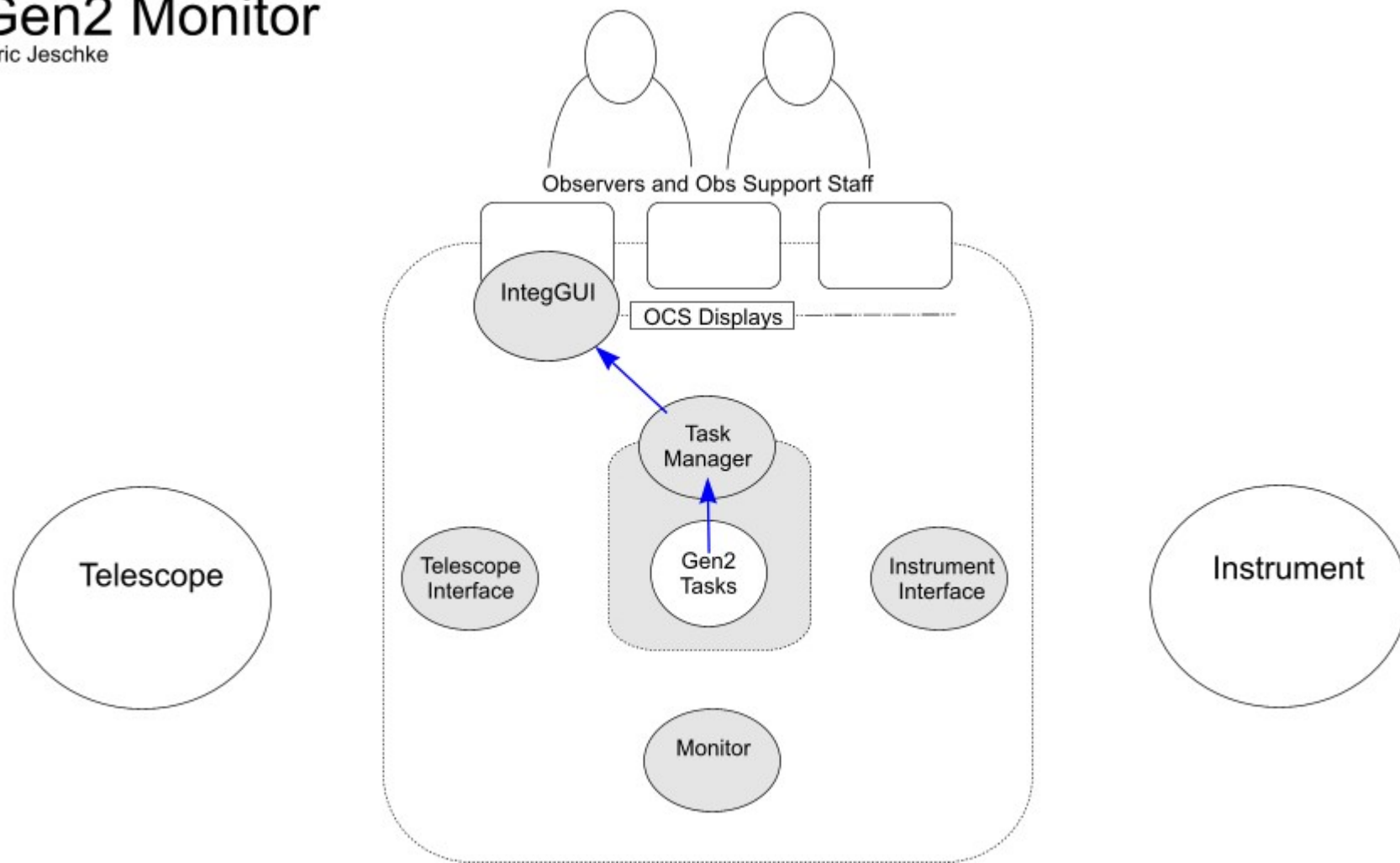
Gen2 Monitor

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Gen2 Monitor

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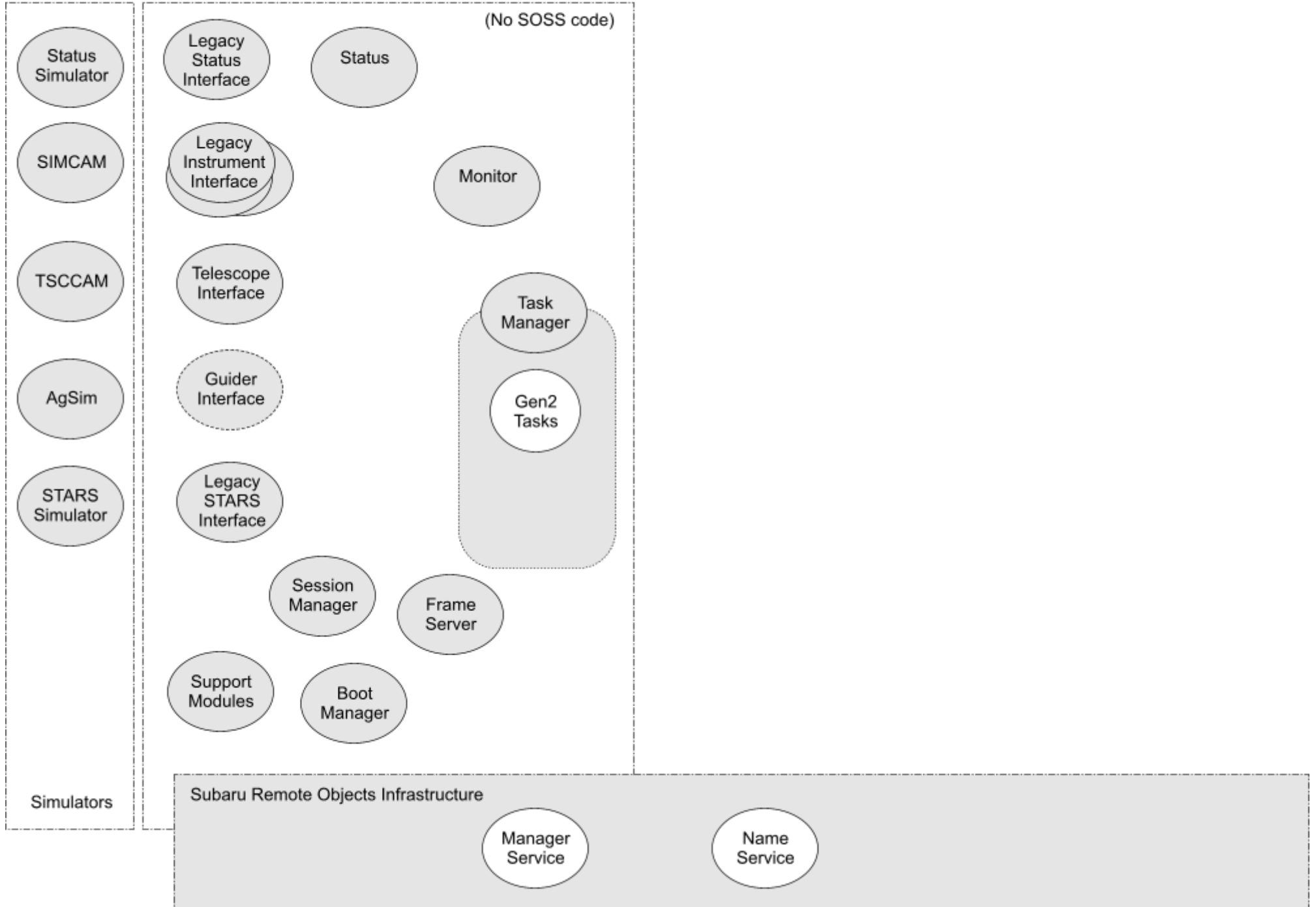


Gen2 Software Diagram

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Phase I

Gen2 Back Ends (Servers)



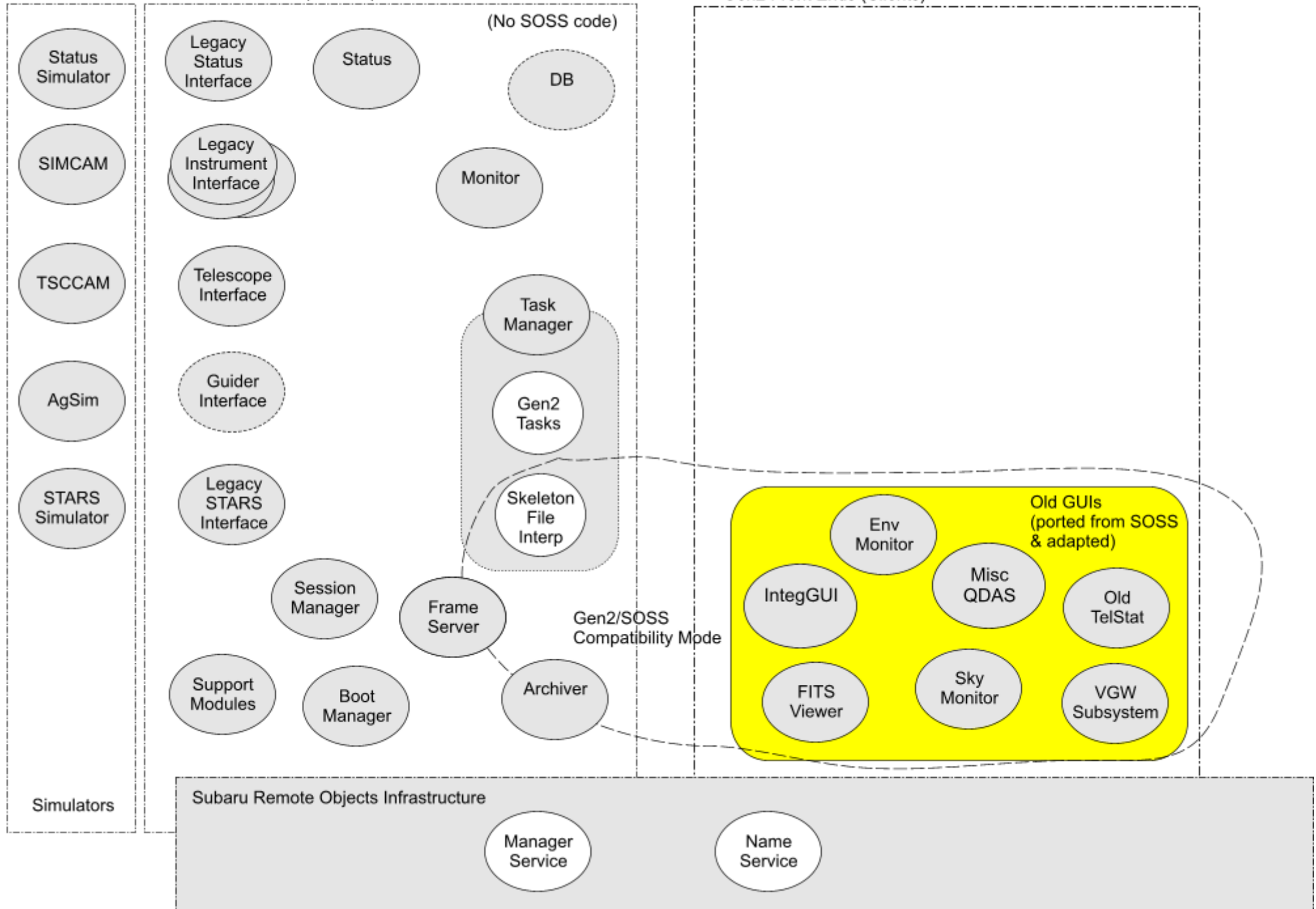
Gen2 Software Diagram

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Phase II

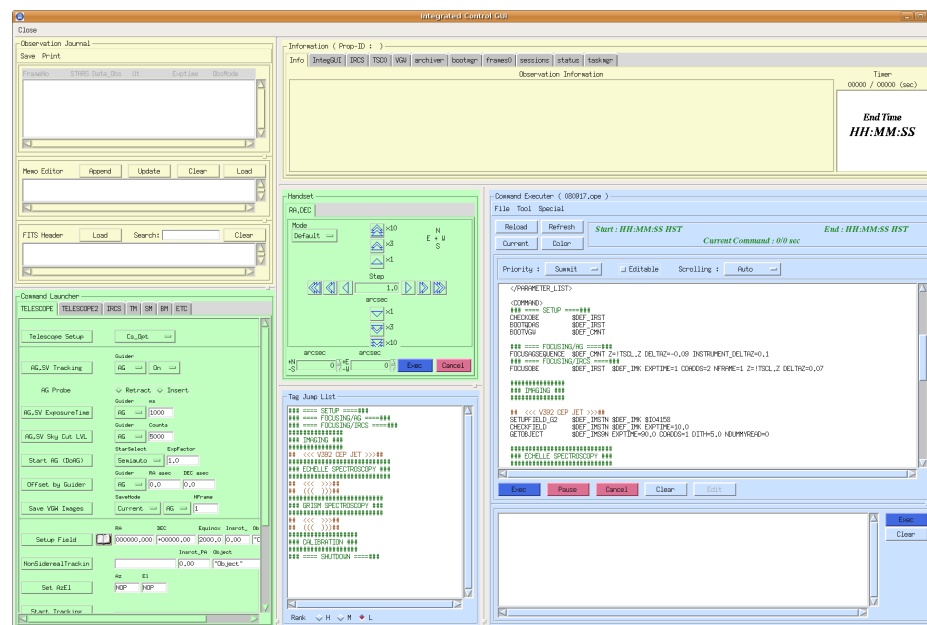
Gen2 Back Ends (Servers)

Gen2 Front Ends (Clients)



SOSS Compatibility Mode

- Ability to run legacy observations
 - Support execution of most .sk/.ope files
 - Support some legacy GUIs (e.g. IntegGUI, TelStat, VGW, QDAS, Skymonitor)
- Allows Gen2 use with minimal retraining
- Allows time to develop new user interfaces



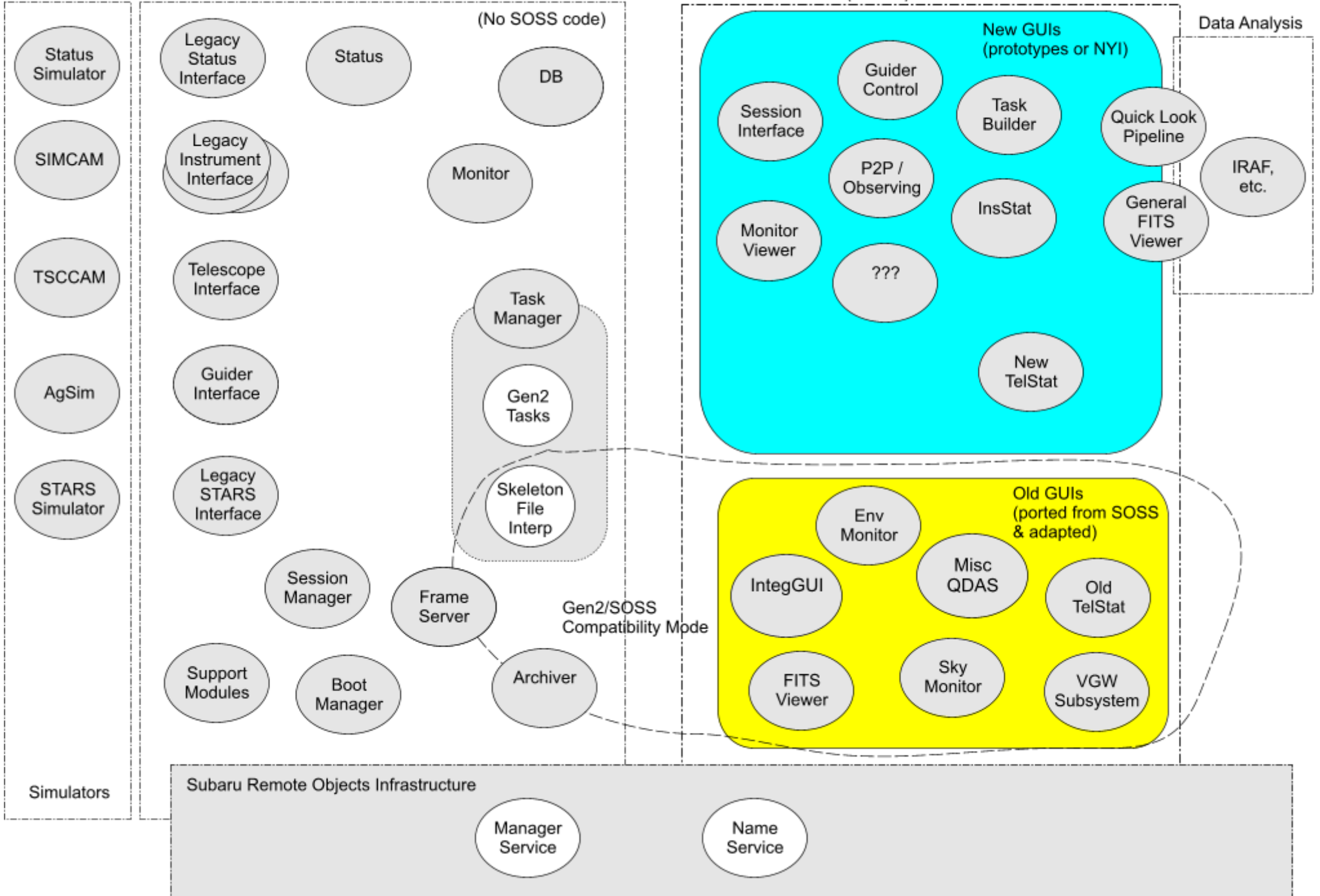
Gen2 Software Diagram

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Phase III

Gen2 Back Ends (Servers)

Gen2 Front Ends (Clients)



Hardware

- High-Availability cluster design
 - Redundancy and fault-tolerance
- Commodity hardware (when possible)
- Simple maintenance and replacement
- Full remote manageability
- Extensive monitoring of fans, temp, disks, memory, CPU, network, etc.



Hardware Redundancy



- No specialized nodes: any node can do any job
- Redundant components to provide fault-tolerance and graceful hardware failover
 - All disks in RAID configurations
 - Dual power supplies
 - Dual network ports in bonded configuration
 - Multiple fans
 - Multiple CPUs

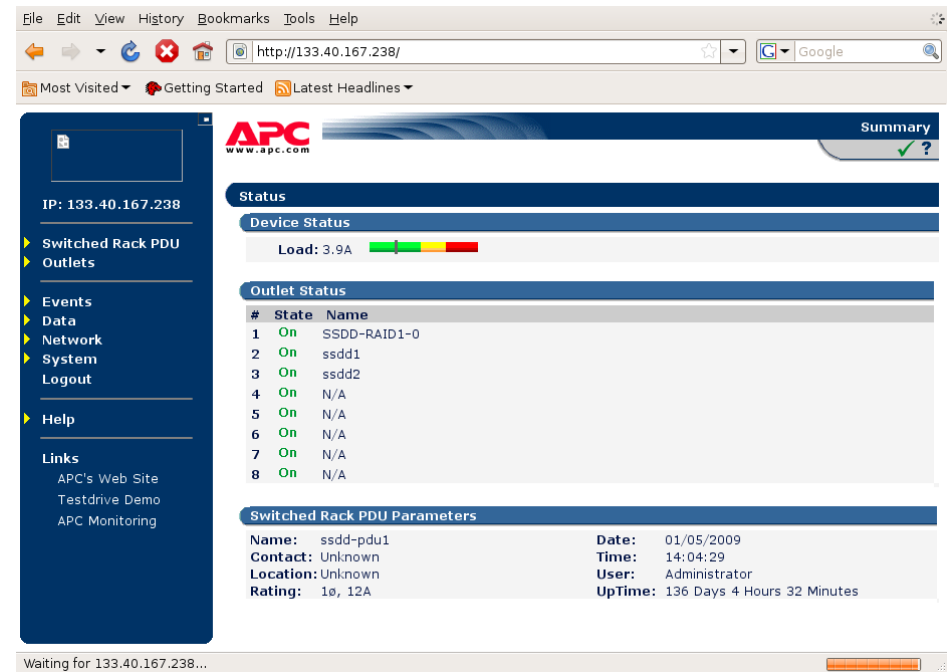
Simple Maintenance and Repair

- All disks are front-accessible hot-swap
- CPUs are generic x86 rack mount units, easily replaceable
- System software (OS, etc) is “cloned” to a new system in minutes



Full Remote Managability

- All hardware in Gen2 cluster can be managed over the network from Hilo base
- IP-enabled KVM (keyboard/video/mouse)
- IP-enabled power distribution
- IP-enabled UPSes
- IP-enabled switches
- e.g. turn off power, reboot, access console, etc.



The screenshot shows a web browser window displaying the APC management interface for a Switched Rack PDU. The browser address bar shows the URL `http://133.40.167.238/`. The interface includes a navigation menu on the left with options like 'Switched Rack PDU', 'Outlets', 'Events', 'Data', 'Network', 'System', 'Logout', 'Help', and 'Links'. The main content area displays the following information:

- APC** logo and 'Summary' link.
- Status** section: 'Device Status' shows a 'Load: 3.9A' with a progress bar.
- Outlet Status** table:

#	State	Name
1	On	SSDD-RAID1-0
2	On	ssdd1
3	On	ssdd2
4	On	N/A
5	On	N/A
6	On	N/A
7	On	N/A
8	On	N/A

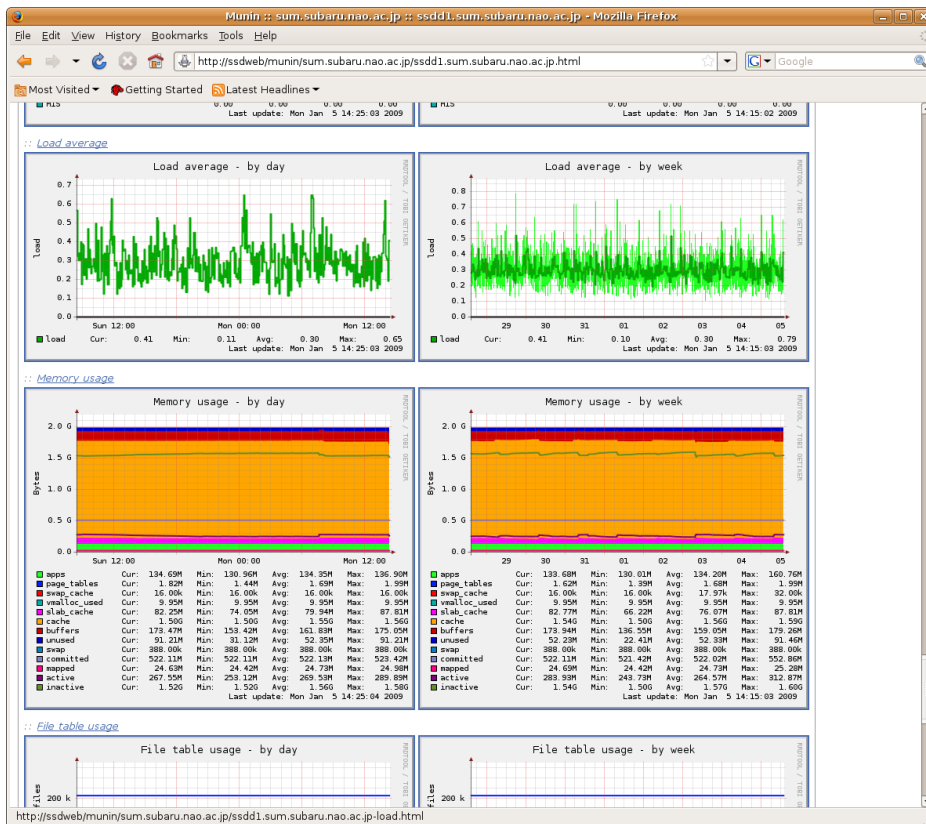
- Switched Rack PDU Parameters** section:

Name: ssdd-pdu1	Date: 01/05/2009
Contact: Unknown	Time: 14:04:29
Location: Unknown	User: Administrator
Rating: 1ø, 12A	UpTime: 136 Days 4 Hours 32 Minutes

The status bar at the bottom of the browser window indicates 'Waiting for 133.40.167.238...'.

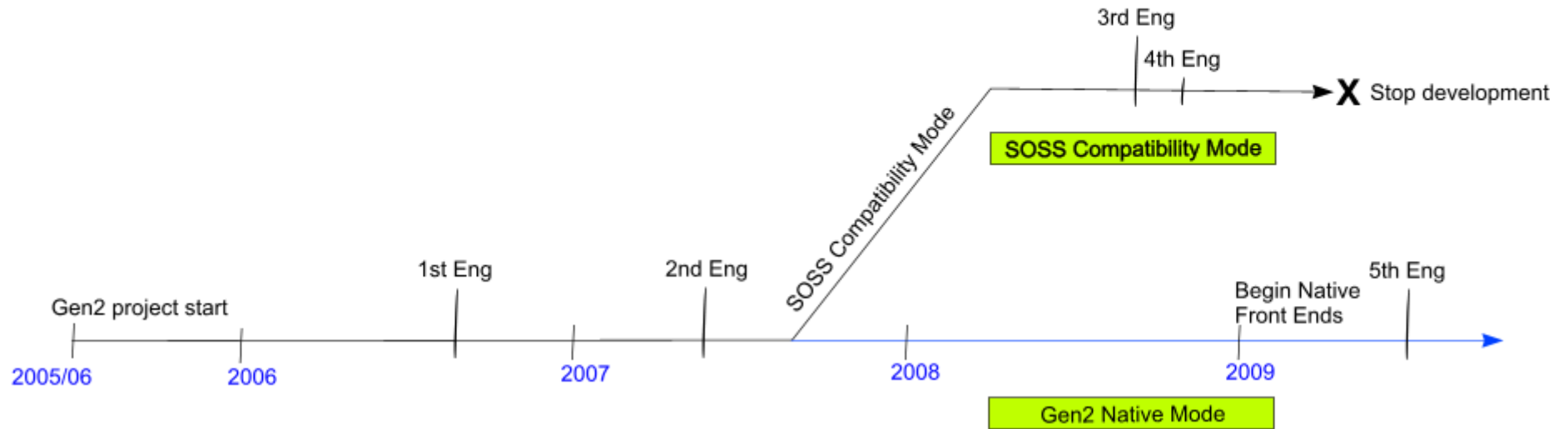
Hardware Monitoring

- Hardware is monitored continuously
- Alerts and statistics easily seen via web interface



Gen2 Development Timeline

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Gen2 Rollout: 2009

- To smooth adoption of Gen2 we must manage the risk of using new software
- → Make it simple to “fall back” to using SOSS on any given legacy-style observation
- Develop a simple, quick switch procedure between Gen2 and SOSS observation
- Share frame id allocation and ensure accessibility of data files from both sides
- Begin with risk share, staff obs, new instruments

Questions?

Thank You!

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