

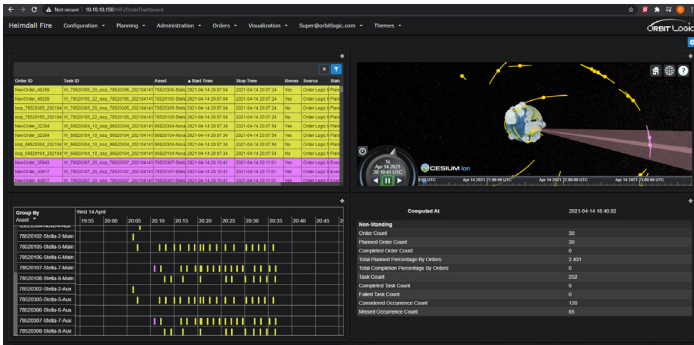


Heimdall

SSA/SDA Sensor Tasking

In Norse Mythology, Heimdall uses his foreknowledge and keen eyesight to keep watch for disaster from his home near the Rainbow Bridge. Orbit Logic has developed the Heimdall software solution to optimize monitoring for space situational/domain awareness (SSA/SDA). Heimdall optimally schedules ground- and space-based sensors to make observations of known and uncharacterized objects and search for new objects for safer space operations.

Heimdall Web UI Dashboard



Optimized Sensor Tasking for SSA/SDA

Heimdall automates and optimizes **SSA/SDA sensor tasking** for improved space object catalog maintenance, leveraging existing Orbit Logic COTS mission planning and scheduling software. Orbit Logic and its academic partners have continued to build on and refine this SSA/SDA multi-sensor tasking optimization capability, augmenting it with a new Track Prioritization Component with FiSST-inspired computations for predicted Information Gain and Probability of Detection and a new SSA/SDA-specific Figure-of-Merit (FOM) for optimized SSA/SDA sensor tasking. The improved system provides key elements required for improved tasking leading to enhanced object catalog maintenance.

Heritage

Heimdall has been deployed in a secured environment for a U.S. government customer and has multiple years of successful operational heritage. In addition, the initial Heimdall software has been deployed at the NSDC, and has undergone multiple upgrade cycles based on operator feedback under an Air Force SBIR contract.

Improvements

The Heimdall software for SSA/SDA sensor tasking provides greatly improved performance over manual tasking, improved coordinated sensor usage, and tasking schedules driven by catalog improvement goals (reduced estimated error covariance across the space catalog, etc.). It also enables more responsive sensor tasking to address external events, newly detected objects, newly detected object activity, and sensor anomalies. Instead of having to wait until the next day's scheduling phase, events can be addressed with new tasking schedules within seconds or minutes.

Better SSA/SDA

Heimdall improves SSA/SDA by providing better tasking to efficiently maintain the space catalog. By driving sensor tasking and scheduling based on predicted Information Gain and other relevant factors, better decisions are made in the application of available sensor resources, leading to an improved catalog and better information about the objects of most interest.

Key Functions

- The Heimdall solution includes the following primary functions:
- Optimized SSA/SDA sensor observation scheduling for multiple sensors
- Dashboard for real-time awareness of planned observations and related metrics
- Observation opportunity computations and scoring
- Configurable sensors and sensor attributes
- Order definition and management for SSA/SDA observations (space objects and search areas)
- Configurable user and access management