Objective
We will develop an architecture which shifts sensor web control to a distributed set of intelligent agents versus a centrally controlled architecture. Constellation missions introduce levels of complexity that are not easily maintained by a central management activity. A network of intelligent agents reduces management requirements by making use of model-based system prediction, and autonomic model/agent collaboration. The proposed architecture incorporates agents distributed throughout the operational environment that monitor and manage spacecraft systems and self-manage the sensor web system via peer-to-peer collaboration. The intelligent agents are mobile and thus will be able to traverse between on-orbit and ground-based systems.

Approach
Our team will develop and integrate these technologies: Model-Based Operations, Intelligent Agents, Software Bus Architectures, and Sensor Webs.

EO-1 and ST-5 have successfully demonstrated that model-based operations can support autonomous control of a satellite mission. The next step is to connect the autonomous operations that take place on the platform to those happening on the ground.

Co-I’s/Partners
- Al Underbrink / Sentar Inc.
- Daniel Mandl / GSFC

Key Milestones
- Bus-Bus bridge and CHIPS demonstration April/2007
- Mobile agent demonstration Nov/2007
- Basic framework report capability July/2008
- Updated architecture documentation August/2008
- Final architecture documentation June/2009
- Comprehensive demonstration August/2009

GMSEC and CFE/S features include Plug-and-Play Components, and Standard Messages implementing a software Information Bus.

TRL_{in} = 3