

Emergent and GDS

Emergent Space Technologies, Inc. is a partner with the NASA Goddard Space Flight Center (GSFC) in the continued development of the Goddard Dynamic Simulator (GDS). The GDS is a spacecraft integration and test simulator being developed by the Flight Software (FSW) Branch GSFC.

The GDS provides onboard satellite software developers with the capability to test FSW with or without the presence of actual spacecraft sensors, actuators, and instruments.

Regardless of the availability of spacecraft hardware, the GDS produces an extremely detailed simulation of a single satellite, including low-level hardware interfaces. The diagram below provides an architectural summary of the GDS.

Currently, the GDS is being used to test FSW for the Solar Dynamics Observatory (SDO) mission, and future users of the GDS include the Hubble Space Telescope (HST) Robotic Vehicle (HRV).

No Hardware? No Problem!

The GDS takes commands from FSW, sends them to software models of spacecraft hardware, such as Coarse Sun Sensors (CSS) and Reaction Wheel Assemblies (RWA), and returns as data the modeled feedback from such sensors and actuators. GDS supports portable FSW with abstracted calls for Operating System and Software Bus (SB, 1553 std.) functions.

Got Hardware? Get GDS!

For an even more authentic simulation of FSW execution, the GDS can interface with actual spacecraft sensors and actuators through the various interface cards and test boxes for propulsion components, Attitude Control Electronics (ACE) elements such as CSS and RWA, and Gimbal Control Electronics (GCE). Signals sent to these hardware components can be monitored through the use of the ASIST Ground System, a GSFC-produced real-time command, control, and telemetry monitoring system.

