PNPSAT

Session: SpaceWire Missions and Applications

Long Paper

Donald Fronterhouse

Scientific Simulation, Inc

2951 Marina Bay Dr, #130-306

League City, TX 77573

E-mail: don@ssi-sw.com

ABSTRACT

The Air Force Research Labratory has initiated a program to create the first satellite based entirely on the principles of plug-and-play as represented by the Space Plug-and-play Avionics (SPA) approach. Unlike other satellites, PnPSat is designed to be constructed extremely rapidly, based on design descriptions that can be eventually produced automatically from a push-button tool flow. The plug-and-play satellite (PnPSat) employs modular components, from the structural panels to the guidance and health/status devices, taking full advantage of the self-describing mechanisms inherent in the SPA approach. Panels contain SpaceWire routers and multiple connection sockets to support the arbitrary arrangement of spacecraft components on the panels and the connections between panels. In most regards, PnPSat reduces the integration of a satellite to a simplified assembly process, analogous to the assembly of components on a personal computer in which components are enumerated by the host as they are added. Since all components are based on the same, self-describing interface, the proliferation of disparate simulators and emulators are sharply reduced, and a unified "test bypass" mechanism is provided to facilitate hardware-in-the-loop simulation of a single component or the entire satellite at any point during integration of the system. This talk will describe the background and status of the PnPSat development program.

Abstracts should be submitted by e-mail to spacewire@computing.dundee.ac.uk. Note that abstracts should be submitted as PDF files. When submitting an abstract please indicate whether the final paper is to be considered for long (6-8 pages) or short (3-4 pages) presentation and the session the paper should be considered for.