Onboard Short Term Plan Viewer

Lyndon B. Johnson Space Center, Houston, Texas

Onboard Short Term Plan Viewer (OSTPV) is a computer program for electronic display of mission plans and timelines, both aboard the International Space Station (ISS) and in ISS ground control stations located in several countries. OSTPV was specifically designed both (1) for use within the limited ISS computing environment and (2) to be compatible with computers used in ground control stations. OSTPV supplants a prior system in which, aboard the ISS, timelines were printed on paper and incorporated into files that also contained other paper documents. Hence, the introduction of OSTPV has both reduced the consumption of resources and saved time in updating plans and timelines. OSTPV accepts, as input, the mission timeline output of a legacy, print-oriented, UNIX-based program called "Consolidated Planning System" and converts the timeline information for display in an interactive, dynamic, Windows Web-based graphical user interface that is used by both the ISS crew and ground control teams in real time. OSTPV enables the ISS crew to electronically indicate execution of timeline steps, launch electronic procedures, and efficiently report to ground control teams on the statuses of ISS activities, all by use of laptop computers aboard the ISS.

This work was done by Tim Hall and Troy LeBlanc of Johnson Space Center and Brian Ulman, Aaron McDonald, Paul Gramm, Li-Min Chang, Suman Keerthi, Dov Kivlovitz, and Jason Hadlock of United Space Alliance. Further information is contained in a TSP (see page 1). MSC-24335-1

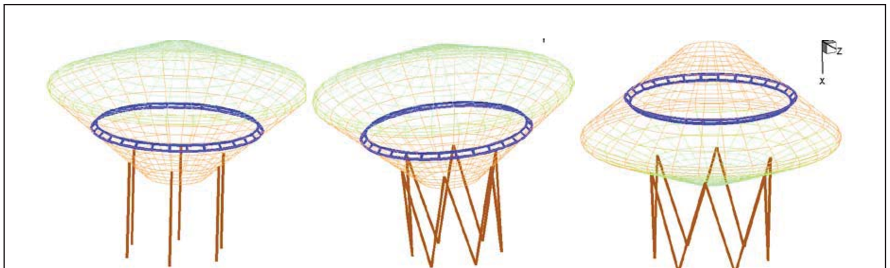
Multidisciplinary Tool for Systems Analysis of Planetary Entry, Descent, and Landing

Langley Research Center, Hampton, Virginia

Systems analysis of a planetary entry (SAPE), descent, and landing (EDL) is a multidisciplinary activity in nature. SAPE improves the performance of the systems analysis team by automating and streamlining the process, and this improvement can reduce the errors that stem from manual data transfer among discipline experts.

SAPE is a multidisciplinary tool for systems analysis of planetary EDL for Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Titan. It performs EDL systems analysis for any planet, operates cross-platform (i.e., Windows, Mac, and Linux operating systems), uses existing software components and open-source software to avoid software licensing issues, performs low-fidelity systems analysis in one hour on a computer that is comparable to an average laptop, and keeps discipline experts in the analysis loop.

SAPE uses Python, a platform-independent, open-source language, for integration and for the user interface. Development has relied heavily on the object-oriented programming capabilities that are available in Python. Modules are provided to interface with commercial and government off-the-shelf software components (e.g., thermal protection systems and finite-element analysis). SAPE currently includes the following analysis modules: geometry, trajectory, aerodynamics, aerothermal, thermal protection system, and interface for structural sizing.



SAPE is capable of analyzing and sizing certain classes of planetary probles, as demonstrated by sample structural topologies for Pathfinder probe.

This work was done by Jamshid A. Samareh of Langley Research Center. Further information is contained in a TSP (see page 1). LAR-17821-1

Bundle Security Protocol for ION

NASA's Jet Propulsion Laboratory, Pasadena, California

This software implements bundle authentication, conforming to the Delay-Tolerant Networking (DTN) Internet Draft on Bundle Security Protocol (BSP), for the Interplanetary Overlay Network (ION) implementation of DTN. This is the only implementation of BSP that is integrated with ION.

The bundle protocol is used in DTNs that overlay multiple networks, some of which may be challenged by limitations such as intermittent and possibly unpredictable loss of connectivity, long or variable delay, asymmetric data rates, and high error rates. The purpose of the bundle protocol is to support interoperability across such stressed networks. The bundle protocol is layered on top of a