Paper ID: 79172
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IAF SPACE OPERATIONS SYMPOSIUM (B6)
Ground Operations - Systems and Solutions (1)

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ERMES MISSION PLANNER: A MULTI-MISSION PLANNING SW

Abstract

With the increase of small missions and constellations composed of many satellites, the new mission planning systems have to provide the capability to plan automatically or not one or more satellites. ERMES aims to support mission operators by providing a multi-mission Mission Planner System SW. It was born from Planetek's practical experience in the ground segments: starting on ground support equipment and scientific mission, it is able to provide a set of tools (along with a full development framework) intended for satellite integrators and operators.

The Mission Planner SW supports the planning of both routine and special satellite and payload operations The system will be used both for preliminary Long Term Planning also for the actual execution scheduling related to the Short Term Planning. The system is in charge of producing the Plan, an XML-file containing the information related to platform routine activities, contacts and other manually scheduled special operations, to be complemented by the payload activities. Thus the file is provided to the Mission Control System for automatic operations execution of both ground and satellite tasks. The optimization algorithm allows respecting the constraints defined by the mission on the contacts, the satellite resources availability and so on.

The ERMES Mission Planner can manage multi-missions by an easy definition of the model of the resources of a single satellite, the ground stations and the constraints to define the plan. The SW allows negotiating the contacts with main Ground Station Providers (like KSAT, Leaf Space, Amazon) and managing also the antenna's unavailabilities.

The ERMES mission planning has a micro-service architecture based on the docker. Each component is isolated to allow scalability according to the number of satellites and data to store. A redundancy mechanism is enabled on the components of the SW to guarantee system availability.

The Frontend is developed with modern Web technologies with an authentication mechanism that allows enabling or disabling functions according to the user's role.