SPACE OPERATIONS SYMPOSIUM (B6)
New Operations Concepts, Advanced Systems and Commercial Space Operations (2)

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SLE PROTOCOL SERVICES: RESULTS OF AN ARCHITECTURE APPLIED AT THE NATIONAL INSTITUTE FOR SPACE RESEARCH.

Abstract

The Space Link Extension (SLE) protocol services establish activities, based on the Consultative Committee for Space Data Systems (CCSDS) for cross support recommendations, including Management Services for Data Transfer and SLE protocol services related to Telemetry and Telecommand. These services standards have been adopted by the different space agencies, such as: ESA, NASA, CNES, DLR, ASI, JAXA, INPE, to performing tracking and control of the spacecrafts. The SLE protocol services allowed the create and evolution the network services for cross support; the networking of terrestrial components comprises: Telemetry, Tracking and Command (TT&C) Ground Stations (GS), Satellite Control Center (SCC), Mission Control Centers (MCC), Data Processing Centers and End Users, which requires an appropriate architecture to support them. This paper presents the results of the studies about SLE Protocol services and implementation of the an Architecture for Dynamic Management of the Space Link Extension Protocol Services which was applied as part of the system of the Satellite Control Center and the TT&C Ground Stations at National Institute for Space Research (INPE). Basically this Architecture for Dynamic Management of the SLE Protocol Services allows: the dynamism for detection of redundancy between ground stations; the transparency in between switching stations, the transmission of the Telecommand and reception of data Telemetry, and the performance of the activities to communicate with spacecrafts and an augmented the capability for tracking and control. The considerations are presented for the development of prototypes and simulators needed the architecture according to CCSDS recommendations and to the implementation of architecture using current computing technologies based on the Internet SLE Protocol One (ISP1), also are presented the scenarios for the tests applied to the validation proposed architecture and the evaluation of results. The possible contributions and limitations of the proposed architecture, and suggestions for future works are also presented in this paper.