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TOWARDS A DYNAMIC MANAGEMENT OF THE SPACE LINK EXTENSION PROTOCOL SERVICES

Abstract

An increasing number of satellites and missions require the development of service networks comprised by terrestrial components: ground stations, mission control center, data processing center and the end user. This network has more and more served as crossing operations to space agencies, which requires an appropriate architecture to support them. Nowadays, INPE's Ground System encompasses three terrestrial components: the Satellite Control Center (SCC), the Mission Center and Telemetry Tracking and Command (TT&C) Ground Stations (GS). The telemetry data and commands generated at the SCC are routed to/from the Cuiabá and Alcântara ground stations, via dedicated communication lines. Besides the telemetry service, the GS receives payload telemetry mainly from Data Collection Platforms (DCP). The Mission Center is responsible for the data storage and its dissemination to DCP users. In this scenario the SCC need to communicate with the satellite, even though it is out of the visibility of the two Brazilian ground stations, in situations, for example, when the satellite is in LEOP phase or when it is in operational routine phase requiring contingent commands. To achieve this goal the SCC needs a support of foreign ground station; that may be obtained in a fast way thanks to the use of SLE protocol services. The SLE protocol establishes activities, based on the CCSDS for cross support recommendations, including service management for data transfer and SLE protocol services related to telemetry and telecommand data. This paper presents a proposal of dynamic management of the Space Link Extension Protocol Services to be applied as part of the system of the SCC at INPE. A large volume of data for parameters setup is required, user has detailed knowledge of the settings, the ground stations and other ground systems; so the idea is to simplify the approach to access ground stations through an Architecture for Dynamic Management of the Service Space Link Extension Protocol that allows: the exchange of configuration parameters; the dynamism for detection of redundancy between ground stations; the transparency in between switching stations; the transmission and reception of data for telemetry; the remote controls and the execution of management regarding the negotiation; the acceptance and delivery of services; the transparence with connections, it means, the user connects to a ground station without having to know a priori the detailed configuration of each station.