

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advanced Systems (3)

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DEVELOPMENT AND VALIDATION OF ADVANCED BROADBAND SATELLITE
COMMUNICATIONS SYSTEMS AND APPLICATIONS**Abstract**

To improve performance and decrease costs of satellite communications, new technological solutions need to be developed. For what concerns the DVB-RCS standard, a widespread standard for broadband interactive communications through satellite, an update called Next Generation (NG) is upcoming, with the goal of amending the previous standard released in 2000 (and following minor updates until 2008). This new standard includes advanced techniques for modulation and coding (also adaptive), multiple beams architectures support, new medium access strategies and resource allocation, and advanced QoS support, also by means of new control protocol (C2P) messages. In order to assess the performance of new satellite systems and validate applications, simulation and emulation activities are of great importance. In particular, real time emulation provides the opportunity to reproduce realistic environment thanks to the implementation of real architectures and protocols stacks to validate candidate solutions, avoiding to utilize real networks which may be more expensive and less flexible. We developed a broadband satellite real-time emulation platform called SNEP, designed to match the DVB-RCS original definition, which is currently in an update process in parallel to the new NG standard guidelines. The SNEP makes possible to test new solutions and optimization mechanisms in a controlled environment. With the SNEP it is also possible to validate the integration of satellite platforms with terrestrial tails, both real or simulated/emulated with other testbeds. This aspect is very innovative and gives the possibility to test real hardware, applications, and integration with other networks. This work will address the main aspects of the DVB-RCS NG standard, which are tested using the SNEP platform. One of these aspects concerns Quality of Service (QoS) handling, which is of paramount importance to allow the optimal response and guarantee performance to the most critical applications, according to the multi-dimensional priorities defined (flows, user, commercial agreements, etc.). A test campaign performed on the SNEP testbed will show the different approaches to handle QoS in a satellite architecture adopting the DVB-RCS NG standard, including a solution with several priority mappings to multiple queues.