



Enhancing data exploitation through DTN-based data transmission protocols

Ioannis A. Daglis (1,2), Vassilis Tsoussidis (3), Athanasios Rontogiannis (1), Georgios Balasis (1), Iphigenia Keramitsoglou (1), Dimitrios Paronis (1), Olga Sykoti (1), Antonios Tsinganos (1,4)

(1) IAASARS, National Observatory of Athens, Penteli, Greece (daglis@noa.gr), (2) University of Athens, Department of Physics, Athens, Greece (iadaglis@phys.uoa.gr), (3) Department of Electrical and Computer Engineering, Democritus University of Thrace, Xanthi, Greece (vtsaousi@ee.duth.gr), (4) Department of Informatics and Telecommunications, University of Athens, Athens, Greece

Data distribution and data access are major issues in space sciences and geosciences as they strongly influence the degree of data exploitation. Processing and analysis of large volumes of Earth observation and space/planetary data face two major impediments: limited access capabilities due to narrow connectivity windows between spacecraft and ground receiving stations and lack of sufficient communication and dissemination mechanisms between space data receiving centres and the end-user community. Real-time data assimilation that would be critical in a number of forecasting capabilities is particularly affected by such limitations. The FP7-Space project “Space-Data Routers” (SDR) has the aim of allowing space agencies, academic institutes and research centres to disseminate/share space data generated by single or multiple missions, in an efficient, secure and automated manner. The approach of SDR relies on space internetworking – and in particular on Delay-Tolerant Networking (DTN), which marks the new era in space communications, unifies space and earth communication infrastructures and delivers a set of tools and protocols for space-data exploitation. The project includes the definition of limitations imposed by typical space mission scenarios in which the National Observatory of Athens is currently involved, including space and planetary exploration, as well as satellite-supported geoscience applications. In this paper, we present the mission scenarios, the SDR-application and the evaluation of the associated impact from the space-data router enhancements. The work leading to this paper has received funding from the European Union’s Seventh Framework Programme (FP7-SPACE-2010-1) under grant agreement no. 263330 for the SDR (Space-Data Routers for Exploiting Space Data) collaborative research project. This paper reflects only the authors’ views and the Union is not liable for any use that may be made of the information contained therein.