

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Facilities and Operations of Microgravity Experiments (5)

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SPACEMASTER – THE NEXT GENERATION TELEMETRY PROCESSING SYSTEM FOR SPACE
APPLICATIONS

Abstract

DLR-MUSC has long term experience with the development and usage of space data processing systems. The development of the 3rd generation of the telemetry processing system SPACEMASTER is almost finished, and is used extensively in a current deep space project. Further utilization is planned for the operation of the high demanding Columbus 2nd Generation payloads. Whilst existing telemetry processing systems rely on static and inflexible software structures, the new development initiative is based on strictly modular concepts. Past experience revealed that monolithic structures prevent projects from keeping pace with changing requirements over a space project life cycle, paired with the strong requirement for qualification and validation. Modularity and flexibility is not a new request, but due to the lack of software tools could not be satisfactory fulfilled in the past. Today, however, new software tools, standards and technologies are available finding their way into space projects. SPACEMASTER is the modular and scalable software approach based on a JAVA Rich Client Application framework. The software uses abstracted Client/Server infrastructures as well as abstracted data base functions allowing the exchange of communication or data base classes over the lifetime of a system. The main system consists of a dedicated server and a variable number of client stations. Where classical systems differentiate between online and offline data processing, the new system shows online and offline data within in one system simultaneously, merging views in real-time. As every single data point inherits its history and source, the user and operator can trace a certain data point back to the original received space data packet or receive station. The user can attach comments or even documents to a specific data point or a period of data, to further describe the received data. Organizational tree structures per user allow a further structuring of data and information. Despite the standard data visualization clients for graphical or alphanumeric data display, also synoptic displays can be designed and adapted to match with the physical space facility. The system is currently replacing existing telemetry data processing facilities in MUSC (Micro Gravity User Support Center) for the Philae Mission, a deep space cornerstone mission of ESA, which lasts more than 10 years. As user center for the 2nd Generation Columbus payload EML, MUSC is planning to implement SPACEMASTER in order to facilitate the quasi-interactive payload and science operations which is unique to containerless processing in a safe and operator friendly way.