SpaceMaster
Telemetry Data Management System
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SpaceMaster is a generic reusable telemetry data management system used to process, store, and to visualize telemetry data. It is running on multiple client workstations connected to a server. The distributable server system consists of small and stable system core software with open plug-in interfaces. This allows the system to be adapted to new facilities or to react to new requirements and use cases.

**Processing**
The processing is used to extract data from a raw input stream, to calculate calibrated data out of the raw package and to send the data into the data storage. Multiple input streams can be processed sequentially or in parallel. The processing rules can be defined in several ways i.e. by a using a comfortable user interface, writing process sequences (scripting) or by implementing a specific module which can be added to the system using the plug-in interface.

**Visualization**
Online and offline data can be visualized and evaluated in parallel, with standard table and graphic displays. They are automatically merged and displayed within the same user interface component.
The user interface provides functionalities for:
- Tracing data back to its origin
- Customizable export (Raw data, XML, CSV,...)
- Report generation
- Access right management

**Data Organisation**
The system administrator is provided with powerful software tools and infrastructures to reflect a specific organizational setup according to either the technical organization or the operational organization of a space system.

To allow the operator to organize data, definitions and views, a special functionality was implemented, called the System Logic Tree (SLT). This tree organizes different data sources, data types and data representations including definitions or data selections. All available information can be organized via a customizable structure representing e.g. a facility layout, structure or the operational structure of a mission. I.e. data channels can be arranged in the hierarchy of the spacecraft with nodes representing subsystems, or in the operation organization like power supply or thermal monitoring.

**Interfaces & Technologies**
The server consists of an open web service based communication layer which can be used to adapt distributed client application through different programming languages such as Java, .NET, C++, LabVIEW™
The SpaceMaster System includes:
- Distributed client/server platform, based on the JAVA platform Enterprise Edition (JAVA EE)
- Plug-In interface using OSGi (Open Services Gateway Initiative)
- Database abstraction based on the Java persistence layer Hibernate

References
S.E.A. Datentechnik GmbH is an engineering company founded in 1995, and is located in Troisdorf and Cologne (Germany). The business is distributed in the product and projects business. SEA develops and distributes high end measurement and testing hardware and software for almost all industries, as well as solutions for the test and qualification of airborne and space related technical systems.
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The Microgravity User Support Center (MUSC) at DLR supports the preparation and performance of spaceflight experiments. It has gained long term experience with the development and usage of space data processing systems.
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Presently, the requirements for modularity and flexibility in telemetry processing systems are rising and the established monolithic and sometimes inflexible software structures are found to be inadequate. The complete Space Master system is currently being used for the Philae Mission, a deep space cornerstone mission of ESA and is used for the experiment operation of the material science lab facility MSL on board the ISS.