# THE XML APPROACH TO IMPLEMENTING
## SPACE LINK EXTENSION (SLE) SERVICE MANAGEMENT

By Greg Welz, JPL; Gerhard Theis, ESOC; Wallace Tai, JPL
Contact Author - Wallace Tai
e-mail: wallace.s.tai@jpl.nasa.gov, Phone: (818)354-7561, Fax: (818)393-1692

A feasibility study has been conducted at JPL, ESOC, and ISAS to assess the possible applications of the eXtensible Mark-up Language (XML) capabilities to the implementation of the CCSDS Space Link Extension (SLE) Service Management function. The primary objectives of the study are: (a) to help guide the CCSDS Panel 3 in its work on the design of SLE Service Management standard, (b) to establish an approach to service management by which expedient implementation of the related capabilities is possible. If the XML-based approach is deemed feasible, it is our intention to use it on a trial basis for supporting the ISAS MUSES-C mission to be launched in 2002 and the ESA Rosetta mission to be launched in 2003. The study is divided into two parts: (a) a trade-off analysis on the different methods (including XML) of data presentation and data manipulation for the SLE service management, and (b) a prototype task to validate the XML capabilities of representing the schedule requests and configuration parameters in the SLE service package.

The preliminary results of the prototype effort have shown certain prospect of this approach. The chief advantage of the XML-based approach is that it provides an easy means of translating the CCSDS service package represented in XML into center-unique formats for use by existing tools or for display purposes. The commercially available tools for creating service requests in XML format and data mapping have offered a very cost-effective solution to implementation. The prototype task has validated that the current definition of CCSDS service package is sufficient to accommodate the use of XML approach for the exchange of schedule request information between the service user and provider. However, it seems that there exist certain deficiencies in the current specification of the CCSDS service management with respect to the spacecraft telecommunications configuration. These deficiencies will have to be resolved by the CCSDS Panel 3. The XML-based approach has certain limitations too. Chief among them is that the exchange of the service management information between service provider and service user is through the file transfer protocol (FTP) rather than the connection-oriented SLE protocol. This has certain operational ramifications.

Overall, the SLE Service Management, as proposed, is a grand plan allowing high degree of interoperability between the tracking stations and the mission operations centers. As part of this implementation the data that needs to be

moved around, shared, and used needs to be defined and represented in useful formats. These should be done and implemented before, or at least as part of the overall system implementation. XML is the ideal candidate to do this. And if in the course of the SLE implementation, the implementation falls behind schedule or is dropped, XML will still serve the community well as a means of sharing data without the full SLE implementation being in place.