

Middleware Services for the Interplanetary Network

Norm Lamarra, JPL

JPL's new Interplanetary Network and Information Systems Directorate (IPN-ISD) is interested in issues and architectures for future space-based networks, with MarsNet being a primary example. This talk looks at some mission and science challenges, and sketches an approach to addressing some of these challenges via middleware services. We refer to all layers between application and data link layer as "middleware", and preach the "service" approach to developing, deploying, operating, and evolving such middleware. Some middleware is in wide commercial deployment (e.g., CORBA). Within this context, low-level basic services (such as "asynchronous messaging") can be viewed as providing a basis for building a set of "middleware services" that are space-deployable (robust, lightweight, etc.). Progressively higher-level capabilities (such as location and mapping) could be built progressively on top of lower levels, and could be deployed incrementally over several missions to the mutual benefit of all missions who agree to support or utilize emergent infrastructure standards. We believe that resultant ubiquitous and rich interplanetary network infrastructure could be enabling for future space exploration, particularly in view of the increasing desire to achieve more complex and adaptive missions cheaply by developing on-board capabilities such as autonomy.