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**ABSTRACT**

**“The Interplanetary Internet”**

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The exploration of space began with naked-eye observations of the stars and moon. In more recent centuries, evolving Earth-based telescope technologies - first optical, then radio – enhanced our view. In the last few decades we have placed observing resources into near Earth orbit and have sent robotic missions to other parts of the Solar system for a closer look.

Early in 1998, a few members of the terrestrial Internet community began thinking about adaptation of the current Internet to support the communications needs of space exploration. In parallel, the space communications standards community was already trying out variants of the Internet’s TCP/IP protocol suite in space-based applications. Mutual recognition led to the formation of the “Interplanetary Internet” project, aimed at extending the evolving technologies of Earth’s Internet to an interplanetary scale. The space technology and Internet technology communities are therefore converging in this project, which is primarily funded by the US Defense Advanced Research Projects Agency (DARPA) as part of the Next Generation Internet initiative.

The creation and adoption of Internet-friendly standards for space communication will allow us to build the shared interplanetary communication infrastructure that will be needed to support the expansion of human intelligence throughout the Solar System. If the Earth’s Internet is a “Network of Networks”, the best way to envision the Interplanetary Internet is to picture a “Network of Internets”. Ordinary Internets (many being wireless in nature) will be placed on the surface of moons and planets as well as in free-flying spacecraft. These remotely deployed Internets will run protocols that are extended and adapted as necessary to match the local communications environment. A system of Interplanetary Gateways, connected by deep-space transmission links, will form an “Interplanetary Backbone” that provides connectivity between each of the remote Internets. New long-haul protocols, some confined to the backbone network and some operating end-to-end, will allow the distributed Internets to communicate with each other.

Architectural design of the Interplanetary Internet is now underway and prototype flight testing of some of the candidate protocols is anticipated within a year. This talk will describe the current status of the project.