**IONAC-Lite**

A combination of energy and performance optimization is attained for high-speed Delay Tolerant Networking.

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The Interplanetary Overlay Networking Protocol Accelerator (IONAC) described previously in “The Interplanetary Overlay Networking Protocol Accelerator” (NPO-45584), *NASA Tech Briefs*, Vol. 32, No. 10, (October 2008) p. 106 ([http://www.techbriefs.com/component/content/article/3317](http://www.techbriefs.com/component/content/article/3317)) provides functions that implement the Delay Tolerant Networking (DTN) bundle protocol. New missions that require high-speed downlink-only use of DTN can now be accommodated by the unidirectional IONAC-Lite to support high data rate downlink mission applications. Due to constrained energy resources, a conventional software implementation of the DTN protocol can provide only limited throughput for any given reasonable energy consumption rate. The IONAC-Lite DTN Protocol Accelerator is able to reduce this energy consumption by an order of magnitude and increase the throughput capability by two orders of magnitude. In addition, a conventional DTN implementation requires a bundle database with a considerable storage requirement. In very high downlink data rate missions such as near-Earth radar science missions, the storage space utilization needs to be maximized for science data and minimized for communications protocol-related storage needs.

The IONAC-Lite DTN Protocol Accelerator is implemented in a reconfigurable hardware device to accomplish exactly what’s needed for high-throughput DTN downlink-only scenarios.

The following are salient features of the IONAC-Lite implementation:

- An implementation of the Bundle Pro-