

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
Near-Earth and Interplanetary Communications (7)

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THE BENEFITS OF DELAY/DISRUPTION TOLERANT NETWORKING (DTN) FOR FUTURE  
NASA SCIENCE MISSIONS

**Abstract**

The NASA Science Mission Directorate (SMD) has undertaken a study to identify the benefits of a Delay/Disruption Tolerant Networking (DTN) communications architecture to produce a strategic DTN implementation plan. The development of the DTN protocol suite began in the early 2000s. The goal of DTN is to enable networked-based communications analogous to those provided by the terrestrial Internet, but that occur in scenarios that will not support the terrestrial Internet Protocol (IP) suite.

In the Fall of 2018, SMD completed the first phase of its DTN study. The purpose of this initial study phase was to identify and verify the benefits that SMD missions would realize by implementing DTN. To ensure identified benefits were valid, the study team worked closely with NASA representatives from a variety of mission types to understand and evaluate the effects of DTN implementation and operations.

To accomplish this task, the DTN study team conducted a series of meetings with mission representatives to:

- Review what DTN is and how it works
- Discuss how communications are currently accomplished for each mission, including operational constraints typically encountered and solutions to remediate such constraints
- Discuss how DTN implementation would affect the mission (or similar future missions) and identify expected benefits

This paper summarizes the results of this first phase and concludes with the initial material from the study's second phase, which will determine strategy options for implementing a DTN architecture. This material includes a summary of the current state of DTN development and identifies the gaps between the current state and a desired DTN architecture end state.