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DEVELOPING ADVANCED NETWORKING TECHNOLOGIES AND APPLICATIONS OVER ACTS

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ABSTRACT

Next generation satellite systems will provide wider bandwidth capability than current systems and will be an integral part of the national and global information infrastructure (NII/GII). The Advanced Communications Technology Satellite (ACTS) continues to serve as a national testbed for the development of advanced networking technologies and applications needed for the national/global information infrastructure (NII/GII).

Networks of today are increasingly becoming Internet based. As the Internet continues its geometric growth, there will be an integration of wired, wireless, and satellite distribution paths. The global market place is also driving the needs for ubiquitous coverage to anywhere on earth while the desire for greater data rates increases. Satellites will, undoubtedly, be used to support this global information infrastructure. NASA extensively uses satellites in near-Earth, inter-planetary, and deep space applications. It's goal is to extend the Internet to space to communicate with these systems based on commercial technologies. Therefore, it has been involved in various activities to ensure that the hardware, software and protocols being used will include the characteristics of satellite links such as having a large bandwidth-delay product.

The last two years of operations have involved a number of experiments over ACTS that integrate terrestrial computer and networking technologies with satellite networks. The results of these experiments are impacting the development of satellite friendly Internet standards needed for the incorporation of satellites in the NII/GII. In addition, a number of experiments have been performed that demonstrate network-based applications in areas such as telemedicine, distance education, and in support of NASA mission information transfer.

The design, implementation, and highlights of results for these experiments will be described. Also, the impact of these experimental results in the development of standards and protocols, refinement of commercial products and services, and expansion of the information infrastructure will be presented.