



Networking technologies enable advances in Earth Science

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Abstract

This paper describes an experiment to prototype a new way of conducting science by applying networking and distributed computing technologies to an Earth Science application. A combination of satellite, wireless, and terrestrial networking provided geologists at a remote field site with interactive access to supercomputer facilities at two NASA centers, thus enabling them to validate and calibrate remotely sensed geological data in near real time. This represents a fundamental shift in the way that Earth scientists analyze remotely sensed data. In this paper we describe the experiment and the network infrastructure that enabled it, analyze the data flow during the experiment, and discuss the scientific impact of the results.

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1. Introduction

The NASA Research and Education Network (NREN) team conducts research to enable the infusion of emerging network technologies into NASA mission applications. The NREN testbed peers with

high-performance testbeds sponsored by other Federal agencies and with the university-led Internet2 Abilene testbed to provide a nationwide platform for conducting network research and for prototyping and demonstrating revolutionary applications.

The NREN team has partnered with NASA's Earth scientists in several endeavors in the past, including both application prototyping and technology development. Specific activities include QoS testing and experimentation between NASA Goddard Space Flight Center (GSFC) and NASA Ames Research Center (ARC), pre-launch check-out of instruments on the Aqua and Aura Earth Observing Satellites, helping to reduce

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