# Evaluation of a Multihop Airborne IP Backbone with Heterogeneous Radio Technologies

## Abstract:

In recent years, there has been increasing interest in the US Department of Defense to build an on-demand airborne network for communications relay utilizing high-capacity, long-range military radio systems. While these systems operate well in a network of homogeneous systems, platforms generally employ multiple heterogeneous radio systems making internetworking difficult due to varying radio characteristics and lack of interoperability. Although simulations and emulation tests can provide a baseline for how systems will perform in a controlled environment, field tests are crucial to demonstrate capabilities in real-world operating environments. In this paper, we present measurement results from a field test involving two airborne platforms forming a dynamically routed aerial IP backbone over 200 nautical miles with various radio systems as part of the C4ISR on-the-move 2010 exercise. We present measurement results on per link performance, radio-to-router interface performance, and multihop network performance results with prototype software on open source platforms. Additionally, key lessons learned and recommendations are given.