Abstract

This paper describes a general purpose Real Time Location System (RTLS), GRAIL, version 1.0. GRAIL provides real-time, adaptable, indoor localization for wireless devices. Because GRAIL’s focus is to localize as diverse a set of devices as possible, it utilizes a centralized, anchor based approach. GRAIL defines an abstract data model for various system components to support different physical modalities and various localization algorithms. We show through real deployments that GRAIL functions over a variety of physical modalities, networks, and algorithms. Further, we found that a centralized solution has critical advantages over distributed implementations for handling privacy concerns. A contribution of this system is its universal approach: it can integrate different hardware and software capabilities within a single localization framework. The deployment of such a system in academic and research environments allows researchers to explore issues beyond algorithms and investigate effects in real deployments.