

ABSTRACT

This thesis presents a new method of physical layer synchronization for wireless communications. In particular, LTE release 12 introduces new device to device capability that lays down some of the groundwork for incorporating an ad-hoc protocol into LTE itself. Our method consists of expanding upon existing synchronization signals already present in LTE such that physical synchronization can occur in a distributed multi-point to multi-point fashion as opposed to the typical point to point fashion. This allows for a greater amount of synchronization information to be passed between nodes in the system. In addition, we introduce aspects of a novel link layer design that utilizes our physical layer distributed synchronization method demonstrating the validity of the physical layer technique.