

On The Method and Performance Evaluation of A Hybrid Mesh-Tree Topology

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Abstract

In this paper, a hybrid mesh-tree topology construction for Bluetooth ad hoc network is proposed. The hybrid mesh-tree constructs a mesh-shaped topology in one dense area that is extended by tree-shaped topology to the other sparse areas. First, a designated root constructs a tree-shaped subnet, and then propagates a constant k in its downstream direction to determine new roots. Each new root asks its upstream master to start a return connection to convert the first tree-shaped subnet into a mesh-shaped subnet. At the same time, each new root repeats the same procedure as the root to build its own tree-shaped subnet until the whole scatternet is formed. As a result, the mesh subnet size can be controlled by appropriated selecting the k parameter. Simulation results show that the hybrid mesh-tree achieves better network performance than blueHRT does. As a result, the optimal k value can be determined, and the hybrid mesh-tree generates an efficient scatternet configuration.

Keyword : Bluetooth, Ad-hoc networks, Scatternet formation