Automatic Clustering algorithms for In-Building Solutions in LTE

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Abstract:

Ericsson Radio DOT System (RDS) appears as a promising cost-effective solution to develop small cells, providing adequate coverage in buildings. The selection of new indoor sites in microcellular environments is based on a tradeoff between coverage, capacity and monetary cost. This monetary criteria depends on cost equipment, Digital Units (DUs), Indoor Radio Units (IRUs) and Radio DOTs, and also on the dimensioning and clustering algorithms. The dimensioning algorithm computes the number of DOTs, IRUs and DUs needed. The clustering algorithm assigns IRUs of different buildings into a single DU, reducing deployment cos ts. In this paper, a new clustering algorithm, designed to be integrated in a site selection tool, is presented. The proposed method is based on a local refinement algorithm, which starts with an initial solution where the new site has its own DU, which is then checked for possible reallocation to existing DUs. After adding a new DU, the algorithm checks if previously planned IRUs should be reallocated to reduce cabling costs (i.e., the algorithm performs reclustering). To assess the method, the algorithm is tested with a dataset constructed from a real heterogeneous scenario, RDS vendor specifications and operator constraints. Results show that the inclusion of the proposed clustering algorithms can reduce the total network cost by up to 60\% in a real scenario.