Abstract

Small Cells and Mobile Clients: a Measurement Study of an Operational Network

by

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Small cells address the increasing traffic demands from mobile users and target improved coverage and capacity and better quality of experience to users. This thesis presents the first large-scale measurement study of voice and data service performance of an operational small cell cellular network. Nation-wide fine-grained voice service measurements are analyzed to gain insight into the nature and implications of handovers on voice service performance. A new statistical correlation framework to find the statistical dependency between two events across multiple cells is proposed. The effectiveness of the proposed framework is demonstrated using data service quality measurements of a relatively higher traffic demand location. This in-depth study targets a better understanding of the advantages and trade-offs of deploying small cells in operational networks and provides a foundation for future studies of mobility management and development of techniques for improvement of service performance.