

WiOpt 2016 – Invited Talk

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Invited Paper:

Context-Aware Schedulers: Realizing Quality of Service/Experience Trade-offs for Heterogeneous Traffic Mixes

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Abstract:

Modern broadband wireless networks support application mixes, with different, possibly complex, application/user Quality of Service/Experience (QoS/QoE) metrics. The central problem underlying resource allocation for such systems is realizing QoS/QoE trade-offs given the dynamic loads and capacity variability they would typically see. The paper explores a framework for context-aware scheduling based on: (1) context-aware flow classification and management, and (2), complementary base station scheduler. Motivated by typical flow-size distributions for current traffic and characteristics of the associated delay optimal (Gittins index-based) schedulers we propose a novel flow and channel-aware scheduler which meets our design objectives. Using a combination of analysis and simulation we explore the achieved QoS/QoE trade-offs across a dynamic mix of traffic, in particular: 1) mobile web browsing and small file delays; 2) stored streaming video quality vs re-buffering; 3) throughput of larger file downloads. They suggest improved QoS/QoE trade-offs vs traditional proportionally fair schedulers which are robust to the network load.