Software tools for power consumption monitoring of open 5G and beyond research: A review

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Abstract:
This paper investigates four software tools with CPU power consumption estimation capabilities and identifies the most suitable tool for open fifth-generation (5G) and beyond research. The tools considered are Open Hardware Monitor (OHM), Perf, Turbostat, and Powerstat. In this paper, we also show a comparison between hardware- and software-based power consumption monitoring on both Windows and Linux. The work considers experimentally probing the power consumption of a 5G base station component, which has been implemented on an open Radio Access Network (RAN) server computing platform. We found the Turbostat software tool to be the most suitable for our use case. Furthermore, with this tool, we demonstrate software power consumption monitoring of the RAN server, which showed a good correlation with hardware-based power consumption measurements. We also demonstrate the need to calibrate/offset the results to account for power consumption due to other components of a server.