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Energy Consumption in Video Streaming: Components, Measurements, and Strategies - Abstract*

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The rapid growth of video streaming usage is a significant source of energy consumption, driven by improved internet connections and service offerings, the quick development of video entertainment, the deployment of Ultra High-Definition, Virtual and Augmented Reality, as well as an increasing number of video surveillance and IoT applications. To address this challenge, it is essential to understand the various components involved in energy consumption during video streaming, ranging from video encoding to decoding and displaying the video on the end user's screen. Then, it is critical to measure energy consumption for each component accurately and conduct an in-depth analysis to develop energy-efficient strategies that optimize video streaming [1, 2, 3]. These components are classified into three categories [4]: (i) ***data centers***, which include encoding, packaging, and storage on cloud data centers; (ii) ***networks***, which include core network and access networks; and (iii) ***end-user devices*** which involve decoding, players, hardware, etc.

In addition to identifying the primary components of video streaming that affect energy consumption, it is important to conduct a comprehensive analysis of the entire video streaming. It is also essential to balance energy optimization and service quality to ensure that energy-efficient strategies are implemented without sacrificing the quality of video streaming services.

This talk aims to provide insights into the components of video streaming that contribute to energy consumption and highlight the challenges associated with measuring their energy usage. I will also introduce the tools that can be used for energy measurements for those components and the possible and associated strategies that lie within energy efficiency. By accurately measuring energy consumption, digital media companies can effectively monitor and control their energy usage, ultimately leading to cost savings and improved sustainability.

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