Editorial

Advances in Management of Multimedia Services

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In recent years, several important trends can be observed in the delivery of multimedia services: (i) increase of video bandwidth, necessitating content placement, prioritization, scheduling, and cloud-assisted streaming; (ii) increased importance of Quality of Experience (QoE) for the end user; (iii) complex multimedia consumption patterns (interactive multiple screen applications, non-linear TV content consumption over-the-top streaming); (iv) increased mobile video consumption (e.g. on smartphones, tablets) over several wireless technologies; and (v) increased interest in adaptive streaming, where client software determines the desired quality level for segmented content.

These trends pose interesting challenges for the efficient management of multimedia services and applications. The traditional approach of management through a set of Quality of Service parameters (e.g. packet loss, delay, jitter) is no longer sufficient: the quality as perceived by the end users – the Quality of Experience – should be taken into account as well. QoE is per se a purely subjective metric taking into account non-technical aspects like user behavior, user expectations or user interface design, as well as technical aspects on server and client side, of the specific application, as well as of the transport and network layer. Hence, management approaches require the identification of key quality indicators, QoE monitoring as well as QoE control mechanisms which can be used to optimize the user-perceived quality.

This Special Issue presents recent research that addresses these challenges. Ten papers were submitted for this Special Issue and, after extensive review and discussion, it was decided to publish three papers. The authors of these papers were given the time to update their paper and take the review comments and suggestions into account. The selected papers address topics that play a central role in the management of multimedia services: monitoring and measurement for determining the quality of multimedia sessions, and reconfiguration methods for improving their quality.

The first paper by Flaithearta et al., presents a novel mechanism for optimizing the quality of VoIP sessions over 802.11e. This is based on time synchronized endpoints and access points and allows the computation of the delay and delay-related quality factors for VoIP sessions. This information is used by an algorithm that prioritizes

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concurrent VoIP calls according to their performance. The second paper by Wamser et al., analyzes application-aware resource management schemes and evaluates their quality tradeoffs. Analysis methods for network operators to quantify the performance gains for these schemes are presented and applied in the context of video streaming services. Additionally, selection and configuration guidelines are provided. The last paper by Mammela et al., presents mechanisms for the intelligent selection of access points in wireless networks. The associated decisions rely on monitored information concerning the state and the client population of access points, which determine their ranking. Based on progressive video streaming, the performance of network-centric (centralized) and user-centric (distributed) approaches is evaluated in terms of QoE and control overhead.

We expect future work in the area of multimedia services management to further investigate the topics addressed by the selected papers, but also to focus more on issues relating to the collaboration between network operators and content providers as well as on the use of emerging technologies, such as network function virtualization, for flexible content delivery.

We wish to express our thanks to the authors who submitted papers and to the reviewers for their thoughtful comments and useful suggestions. We are also grateful to the Editor-in-Chief, James Won-Ki Hong, for giving us the opportunity to put together this Special Issue and for his support throughout the process.