

# Preface

The accurate and realistic modelling and generation of network workload which may consist of a mix of many complex traffic sources is a difficult and challenging task. Analyses and generation of network workload, in particular in large-scale networks, can be aggravated by the heterogeneity and large number of used network devices and protocols, as well as different types of applications and services which may strongly evolve over time. Furthermore, the purpose of the workload modelling and, therefore, the objectives of the corresponding experimental tests and case studies may vary, e.g., from the performance evaluation analyses to the analyses of network neutrality and security mechanisms. Therefore, in order to keep up with the perpetually emerging new requirements and the corresponding technical challenges, networking research community needs to continuously improve the methods and tools used for workload modelling and generation.

In this thesis, a unified approach for workload modelling and generation with general applicability in IP-based networks is elaborated and a set of the corresponding tools for the specification and generation of synthetic workloads is developed. The architecture of the Unified Load Generator **UniLoG** proposed and implemented in the thesis can be used for the generation of realistic workloads and traffic according to various workload and traffic models at different (e.g. application, transport, and network) service interfaces in IP-based networks. The proposed **UniLoG** architecture provides a high degree of flexibility, extensibility, and scalability in the workload generation process. Further, a set of concrete workload models for exemplarily chosen types of traffic sources (such as VoIP, video, and Web traffic) is elaborated and provided for load generation with **UniLoG**. Several experimental results related to the study of “hot topics” like performance and QoS analysis of video streaming applications are presented and emphasize how the proposed **UniLoG** load generator advances the state-of-the-art in workload modelling and generation.

Load Modelling and Generation in IP-based Networks

A Unified Approach and Tool Support

Kolesnikov, A.

2017, XXI, 316 p. 58 illus., 11 illus. in color., Softcover

ISBN: 978-3-658-19101-6