Quality of Service Provision

SERVQUAL, Special session along with
SERVICE COMPUTATION 2018, February 18 - 22, 2018 - Barcelona, Spain
The Tenth International Conferences on Advanced Service Computing

Janusz H. Klink
Telecommunications and Teleinformatics Department
Wroclaw University of Science and Technology
Wroclaw, Poland
e-mail: janusz.klink@pwr.edu.pl

Abstract— **The paper presents selected aspects of the quality of service assessment and provisioning in telecommunication networks. The paper introduces to a special session on Service Quality (ServQual), which is included in the Tenth International Conference on Advanced Service Computing – Service Computation 2018, held in Barcelona, Spain. Three main topics are discussed: theoretical aspect of the service quality modeling, case studies presenting quality assessment methods and also new hardware and software solutions which improve safety and quality of services in optical networks.**

Keywords- QoS; QoE; Triple Play service; optical networks; optical node achitectures.

I.   INTRODUCTION

Information and Communication Technology (ICT) is supposed to be a key driver of our life. Modern industry, based on process automation, needs both computing power and high speed access to the network. A need for instant communication and access to the information is tightly connected with almost every branch of the economy or any human's activity.

In the past several years we have witnessed a big explosion of different services and applications that help us in both professional and private life. Now, there is a need not only for simple access to the information but for safe, reliable and good quality services.

A basic and officially recognized definition of the term 'quality' can be found in International Standards Organization (ISO) document (ISO8402) [1]. It is defined as 'the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs'. It is a very general definition, which gave the fundamentals of more detailed specifications regarding the quality of service. One of them was formulated by the International Telecommunication Union (ITU) which specified Quality of Service (QoS) as 'the collective effect of service performances that determine the degree of satisfaction of a user of the service' [2].

II.   QoS SOLUTIONS AND CHALLENGES

In the special session on Service Quality (ServQual), held as part of The Tenth International Conference on Advanced Service Computing (Service Computation 2018) in Barcelona, Spain [1], four papers are presented. They discuss different aspects of the service quality. In the first paper Klink [2] discusses selected issues of service quality modeling. The paper presents the fundamental definitions and classification of basic concepts connected with the service quality, based on ITU-T, ETSI and IETF documents. A special emphasis was laid on the problem of user's perception of the quality and the relations between network performance parameters and user's satisfaction of the service. The author presented two case studies of the service quality modeling and proposed examples of simple quality models for two services. The author also discussed the main factors which matter in service quality modeling.

In the second paper, Uhl and Bardowski [3] present the most important techniques for measuring Quality of Service and Quality of Experience for Triple Play Services. They discuss two general models of quality assessment, i.e., dual-ended model and single-ended model. In another words, two kinds of measurement techniques, with reference and with no reference, are presented. The authors also underline that the techniques may be based on evaluation of the transmitted signal (in the end-to-end scenario) or may examine only transmission parameters which influence the service quality perceived by the user. It should be noted that parameter-based methods are usually used to predict the potential influence of the network performance on the final quality, but the signal-based methods give objective QoS measures. The practical part of the paper presents the results of the quality assessment of three services, i.e., Voice over IP, Video over IP streaming and WWW service. The authors showed the relations between objectively measured transmission parameters (QoS) and the final effect of the quality experienced by the users (QoE). In the conclusion, ask a question concerning new challenges in the field of measurement techniques and assessment methods in the light of rapid growth of different Internet of Things (IoT) applications, which may also have an impact on existing services.

The third paper, written by Walkowski, Oko, Kozdrowski and Sujecki [4], discusses the problem of the impact of cyber security on the quality of service. They present the issue on the example of large corporation networking environment using optical networks. A specific issue that they address is a new solution in the area of cloud computing, which relies on implementation of Docker containerization in such a large

scale enterprise (LSE) network systems. This is a concept of running different micro-services. Each of them provides only one solution for a particular problem. As the authors say, this concept eliminates a need to run operating system stack for a new service, like in case of using virtual machines. It also results in lower overhead when delivering service to the customer. The authors underline, that the container technology allows monitoring the services and automatic scaling when system is overloaded. It is obviously a mechanism which can help to improve the service quality in general.

The last paper [5] of the ServQual session is devoted to new optical node architectures in the context of quality of service. Kozdrowski and Sujecki show a new generation reconfigurable add drop optical node architectures and compare them with the classic reconfigurable optical add drop multiplexers (ROADMs), which are widely deployed in Dense Wavelength Division Multiplexing (DWDM) networks [6]. The authors underline that currently new colourless, directionless and contentionless (CDC) ROADMs architectures are of great interest for future generation optical networks. They should allow connection of any colour from any transponder in any fiber direction [7]. Such architectures enhance network flexibility and increase quality of service.

REFERENCES

[1] Service Computation 2018, The Tenth International Conference on Advanced Service Computing, February 18-22, Barcelona, Spain 2018.

[2] J. Klink, "Service Quality Modeling," The Tenth International Conference on Advanced Service Computing (Service Computation 2018) IARIA, Feb. 2018, Barcelona, Spain.

[3] T. Uhl nd P. Bardowski, "QoE and QoS by Triple Play Services: A Comparison Study," The Tenth International Conference on Advanced Service Computing (Service Computation 2018) IARIA, Feb. 2018, Barcelona, Spain.

[4] M. Walkowski, J. Oko, S. Kozdrowski, and S. Sujecki, "The Impact of Cyber Security on the Quality of Service in Optical Networks," The Tenth International Conference on Advanced Service Computing (Service Computation 2018) IARIA, Feb. 2018, Barcelona, Spain.

[5] S. Kozdrowski and S. Sujecki, "Optical Node Architectures in the Context of the Quality of Service in Optical Networks," The Tenth International Conference on Advanced Service Computing (Service Computation 2018) IARIA, Feb. 2018, Barcelona, Spain.

[6] P.N. Ji and Y. Aono, "Colorless and directionless multi-degree reconfigurable optical add/drop multiplexers," The Nineteenth Annual Wireless and Optical Communications Conference (WOCC), Shanghai, China 2010.

[7] L. Zong, G.N. Liu, H. Zhao, T. Ma, and A. Lord, "Ultra-compact contentionless ROADM architecture with high resiliance based on flexible wavelength router, "Journal of the Optical Society of America", 2014.