Autonomic Quality of Experience Management of Software-Defined Networks

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Abstract. Quality of Experience (QoE) refers to the subjective evaluation of the user's perceptions and expectancies during the use of a service. In order to understand it regarding a given service and how to instrumentally stimulate it, one must know and model the different factors and parameters related with technological and human agents. As important as that, is to conceive tools for managing QoE centered in the user, which adopting a top-down approach, are able to adapt the resources in the subjacent network infrastructure according to the user's experience. This study presents an Autonomic Semantic Engine for QoE Management in Software-Defined Network (SDN) architecture. The Engine management cycle together with the SDN control application contribute to the management of QoE with fine granularity, since it minimizes manual settings and allows the MAPE-K control loops to detect QoE violations and make decisions for providing the service according to the user's experience.

1 Introduction

Quality of Experience (QoE) refers to the subjective evaluation of the user perceptions and expectancies during the use of a service. In order to understand it regarding a given service and how to instrumentally stimulate it, one must know and model the different factors and parameters related with technological and human agents. As important as that, is to conceive tools for managing QoE centered in the user, which adopting a top-down approach (from the user to the network), are able to adapt the resources in the subjacent network infrastructure according to the user's experience.

During the past years, the term "Quality of Experience" has generated a lot of documents indexed in scientific databases. The researches have been motivated in order to provide and deliver services that meet and exceed the user's expectations. However, most of them approach the QoE as an extension of QoS (Quality of Service), only prioritizing the technological aspects and thus neglecting other dimensions that interfere with QoE. In addition, proposals are implemented in the infrastructure of current networks architecture, which makes impossible the dynamic configuration of the network in order to meet different demands. Given these