

УДК 004.738

**ANALYSIS AND IMPROVEMENTS OF VOICE TRAFFIC IN DIFFERENT VOICE
TRANSMISSION TECHNOLOGIES**

Verdugo Carpio D.A.

(Университет ИТМО)

Научный руководитель – к.т.н. Балакшин П.В.

(Университет ИТМО)

Abstract

An analysis will be made of the parameters that allow to measure the quality of service (QoS) in the transmission of voice traffic over different technologies, such as voice over IP, voice over LTE, voice over WIFI and voice over NR. First, a study of the architecture of each technology will be carried out, taking into account the different elements and components of each one of them, concentrating mainly on the physical layer and the transmission medium, as well as the different parameters involved in the transmission of voice traffic.

Subsequently, different scenarios will be designed for each technology, which will be simulated in the OMNET++ simulator to obtain the parameters that allow to measure the quality of voice traffic, such as delay, jitter, packet loss, among others. Finally, the values of the parameters obtained will be compared with the values allowed by the standards of each technology to verify if they are within the allowed range, and if the quality of service required by the user is met.

Introduction

The transmission of voice traffic plays an increasingly important role in society. Every day users employ different technologies for the transmission of voice traffic more frequently, and they want to see their expectations regarding the quality of the voice traffic service fulfilled, regardless of the technology used.

For each technology to be used in a massive and commercial way, it is important that it provides acceptable voice quality of service, for this reason, various methods and parameters have been developed for its measurement, as well as improvements not only in equipment transmission of voice traffic, but also in the architectures of each technology, in order to comply with the requirements established by the international entities of standardization of each technology.

However, a large part of the users and voice service providers are unaware of the measurement parameters, the improvements implemented in each technology or the limits of the values of these parameters allowed by telecommunications standards.

It should also be taken into account that some of these technologies periodically update with new releases, which leads to certain analyzes carried out previously not taking into account these improvements implemented by the technologies.

In certain cases, also, the analyzes carried out take into account a single technology, which prevents a broad knowledge of the different technologies currently available for the transmission of voice traffic, their improvements and the parameters for measuring the quality of service.

Main part.

It is proposed to carry out an analysis of the parameters that allow the transmission of voice traffic in the different technologies such as voice over IP, voice over LTE, voice over WIFI, and voice over

NR (5G in the first stage of its development), through of the realization of scenarios for each technology, in which, each scenario will have the necessary elements according to the architecture of each technology.

In each scenario, the physical layer and the channel transmission of the technologies will be mainly considered, so it will be possible to make changes in the characteristics of the end users (such as increasing the number of users and their location, as well as giving the user mobility) to mimic the conditions of a real scene.

Subsequently, these scenarios will be simulated in the OMNET ++ simulator, to obtain the values of the parameters that allow measuring the quality of service in the transmission of voice traffic such as: delay, jitter, packet loss, etc.

Finally, an analysis of the values obtained from the parameters in the simulation of each scenario will be carried out, taking into account the changes in the characteristics of each user and it will be verified if the values of the parameters are within the ranges allowed by the standard of each technology, and if they satisfy the quality of service desired by the user.

Conclusions

It allows to have a broader knowledge of the architecture of each of the technologies that allow the transmission of voice traffic through IP, as well as the improvements implemented to achieve a better quality of service.

The results obtained from this investigation will make it possible to verify compliance with the values of the parameters to measure the quality of voice service in the different technologies, and how the change in the characteristics of the end user influences these parameters.

Verdugo Carpio D.A. (автор)

Балакшин П.В. (научный руководитель)