Research of Multimedia Streaming Transmission in Multiservice Networks

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Abstract - **In order to forecast the quality of media streaming in multiservice networks under conditions of high load of network resources the research of the influence of network circulating traffic on streaming video and the efficiency analysis of existing protocols for transmission of multimedia data is held.**

Keywords - **Streaming traffic, broadcasting, multimedia, multiservice network, network resources.**

I. INTRODUCTION

The rapid development of information technology in particular in the data transmission field reveals large-scale opportunities for applied tools, one of which media streaming is. According to recent researches the capacity of telecommunication multiservice traffic networks is growing rapidly, and actually the share of media streaming is about 30% at that the tendency of increasing is present also. Under these conditions the research of the impact of the same types of traffic on others, critical to the network parameters is actual.

II. THE RESEARCH OF THE INFLUENCE OF THE TRAFFIC ON MEDIA DATA STREAM

For the research of the media streams transmission protocols and the impact of the traffic of other applications on the media stream, the network model the topology of which is used is shown on the Figure 1.
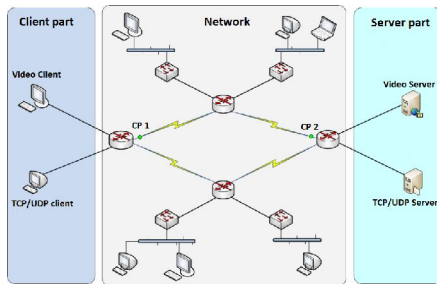

Figure 1. The network model for research

This model consists of client and server part of broadcast media and multiservice IP network. The modeling of network load is realized by the limit of bandwidth channels of 1 Mbit / s and the generation of TCP packets and UDP generators of packets at devices connected to the network. Moreover, the intensity of the generated packets exceeded bandwidth channels. The stream of media data with the general bit rate of 195 kbit / s, the type of the bit rate - variable (VBR), duration 90 seconds is used for the survey. In the control

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points CP1 and CP2, the network packets sniffer WireShark recorded characteristics of the traffic entering the network and after passing through the network, respectively.

The influence of traffic on media data flow that broadcasted using the RTP [1] protocol for these partial conditions: the absence of other traffic, presence of TCP / UDP [2] traffic in the 70/30ratio, if only TCP; available only UDP was being researched. According to the research results of the Internet providers traffic the following data is relevant: TCP - 70%, UDP - 30%, that is why such correlation was selected for the research. Table 1 shows the results.

Table 1

THE RESULTS OF THE TRANSFER OF MEDIA STREAM THROUGH RTP PROTOCOL WITH DIFFERENT PROFILES OF GENERATED TRAFFIC

Parameter	Generated traffic			
	-	TCP/UDP	TCP	UDP
Total packets	2051	2129	2132	2133
Lost packets	0	326	336	244
Lost packets,%	0	15,31	15,76	11,44
Errors-time	0	231	272	231
The average delay, ms	50,38	89,32	96,10	63,07
Jitter, ms	6,76	20,17	22,12	8,68

III. CONCLUSION

According to research results, the greatest impact on transmission quality of media stream has the traffic of applications that use the TCP protocol. This is due to the retransmission of lost packets, which causes additional load on the network. The next step is to find the boundary relations of TCP / UDP in which the partial and complete degradation of media stream is present.

REFERENCES

[1] RFC 3550, RTP: A Transport Protocol for Real-Time Applications, H. Schulzrinne, S. Casner, R. Frederick, V. Jacobson, The Internet Society (June 2003).

[2] Sameer Seth, M. Ajaykumar Venkatesulu "TCP / IP Architecture, Design and Implementation", Wiley, p.772, 2008.