International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Quality of Service Analysis for VoIP over IPv4 and IPv6

Nusiba Osman Mohamed Alkhalefa[1], Amin Babiker A/Nabi Mustafa[2]

Faculty of Engineering, Neelain University, Khartoum, Sudan

Abstract: ***Today Voice over IP (VOIP) is one of the fastest growing Internet application protocols. This paper presents s a comparative approach to study the Quality of Service of VoIPv6 and VoIPv4 of IEEE 802.11, g using OPNET 14.5 Simulation tools. The parameters taken in this study are: end- to -end packet delay, packet delay variation, jitter, and through put.***

Keywords: IEEE 802.11 g, Quality of Service, VOIP, IPv4, IPv6, OPNET

1. Introduction

The new version of the Internet Protocol IPv6, is a solution designed to Overcome the limitations of IPv4 (increasing of the devices, numerous internet service and applications) and fill the future needs in the Internet. Ipv6 solving a major obstacle for the further growth of the Internet. This paper takes a comparative approach to study the Quality of Service of VoIPv6 and VoIPv4 Under a simulated environment. Quality of Service parameters are observed for VoIPv4 and VoIPv6 to establish the suitability and readiness of VoIP for IPv6 and the level at which VoIP be shows an impact from the transition [1].

The Internet constitutes one of dominating methods of communication in contemporary world [2]. Unfortunately, the Internet was not originally designed to transfer data in the real-time. This fact has a huge impact on the quality and efficiency of multimedia transmissions that dominate the Internet .In order to provide reliability of the VoIP [3] the Quality of Service is a critical issue, because real-time applications are very sensitive to delay [4].

2. Network Modeling

The network in this paper is infrastructure WLAN IEEE 802.11g Standard, where AP are connected using Ethernet links .the network has one AP, workstations, two routers, one server and three clients shown in figure1. The parameters are shown in following table.

Parameter	*Value*
Physical characteristic	802.11g
Data rate	54Mpbs
Number of scenarios	2 scenarios
Duration	10 minutes

3. Simulation and Test

The study is a simulation where OPNET14.5 Simulation tools. Two network scenarios are developed with exactly same configuration and elements except for the IP address. One of the scenarios has been configured with IPv4 and the other with IPv6. Fig. 1 shows the network topology used in the study.

Figure 1: Network Model using OPNET simulator
SCENARIOS

4. Results and Analysis

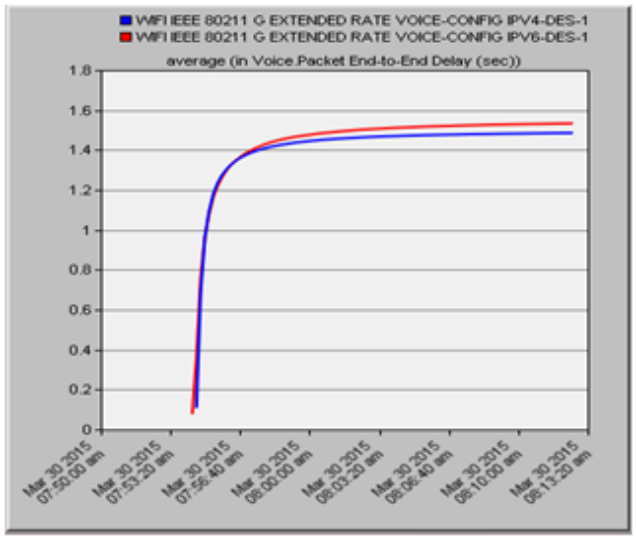

Figure 3: Packet Delay Variation

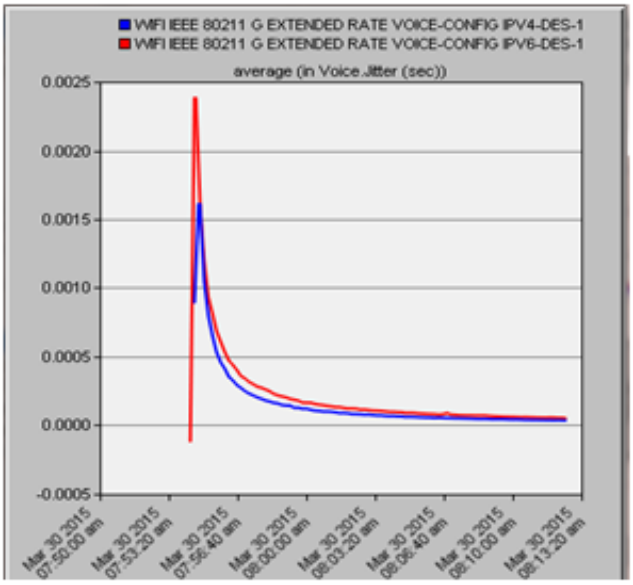

Figure 2: End to End Packet Delay

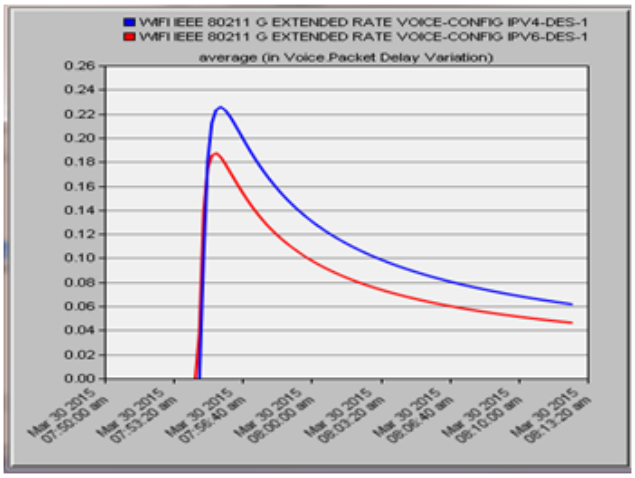

Figure 4: Jitter

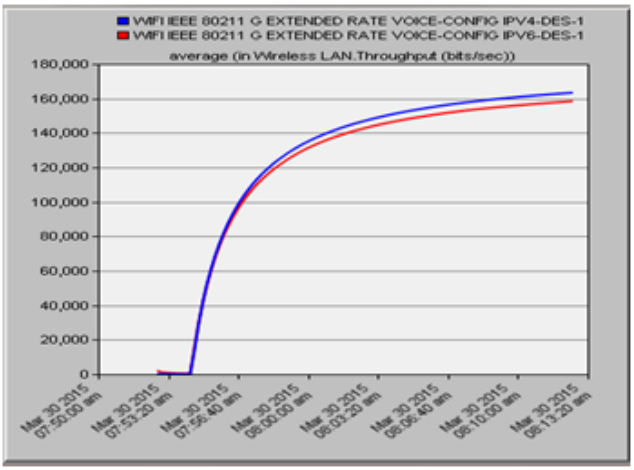

Figure 5: Throughput

The graph in(figure2) shows that IPv6 have the higher end- to- end packet delay than IPv4, Which indicates that IPv4 is better than IPv6, while IPv4 higher packet delay variation than IPv6 as shown in (Figure 3). The graph in (figure 4) shows that IPv6 has the highest jitter compared to IPv4 according to release IEEE802.11 g, which indicates that (release g) has better performance in IPv4 more than IPv6, The graph in(figure5) shows that IPv4 has the higher throughput compared to IPv6.

.

5. Conclusion

This paper presents Quality of Service of VoIPv6 and VoIPv4. Under a simulated environment Using OPNET 14.5 Simulation tools, the results are derived from statistics about certain Quality of Service related parameters that have been carefully selected. Governing factors that directly and significantly relate to the Quality of Service of VoIP networks are delay, jitter and throughput. We found IPv4 has the highest throughput and packet delay variation compared to IPv6, IPv6 has higher jitter and end- to- end packet delay than IPv4. Which indicates that IPv4 is beater for heavy traffic and real time applications similar to VoIP which needs high bandwidth, performance, small delay and jitter.

References

[1] W. Flangan: Understanding VoIP and Unified Communications, John Wiley & Sons, New Jersey2012
[2] K. Roebuck: Video Telepresence, Emereo Pty Ltd2011
[3] M. Barreiros, P. Lundqvist: QOS-Enabled Networks: Tools and Foundations, John Wiley &Sons, New Jersey 2011
[4] H. Kazemitabar, A Survey on Voice over IP over Wireless LANs,(2010) World Academy of Science, Engineering and Technology(WASET),7. pp. 352-35