

## **1.1 Background**

In recent years there is a growing trend in real-time voice communication using internet protocol (IP). Voice over internet protocol (VoIP) is a technology that allows users to make telephone calls using a broadband internet connection instead of an analog phone line. VoIP holds great promise for lowering the cost of telecommunications and increasing the flexibility for both businesses and individuals. VoIP provides a solution that merges both data and voice. VoIP is also called as IP telephony or internet telephony [1].

The advance of technology often requires the emergence of complementary technologies, of which the transition from IPv4 to ipv6 presents a significant example. The move of protocol has focused attention on the level of performance for associated technologies. Among the many internet applications, in contemporary digital communications, VoIP stands apart in importance. IPv4 address space is exhausted. Internet engineering task force (IETF) developed ipv6 which considered as an upgrade of IPv4 to satisfy the continual increase of the IP address needs. The internet is so ramified and enormous that the complete transition from IPv4 to ipv6 is slow. Therefore, their coexistence is inevitable. Manually configured tunnels are an important solution to allow this co-existence that allows transmitting native ipv6 packets over IPv4 networks. Meanwhile [2], VoIP is also gaining momentum with expectation to occupy considerable percentage of internet traffic.

There are various VoIP communication software products that are already available on the internet: skype, google talk, viper, tango, yahoo messenger and windows live messenger. all of them can provide good quality, cheap and even free; but their quality depend on the network type and there routing protocol transmission protocol and the infrastructure. VoIP is now the most popular

telecommunication technology with an estimated user increase in the past three years, due to implementation of broadband internet access, from about 480, 000 users in 2006 to almost 70.6 million users in 2011 [3].

- **Problem statement**

the performance of VoIP over wi-fi (vowifi) is sensitive to throughput, jitter and end to end delay .so, it is very important to analyze the performance of vowifi standard such as (IEEE 802.11 a, n).

- **Proposed solution**

in this research, two scenarios were conducted investigated to the performance vowifi of considering IPv4 and ipv6 using opnet version 17.5 (academic edition) for small network with light traffic and large network with background traffic.

## **1.2 Objectives**

the aim of this research:

- simulate the two scenarios in opnet v 17.5 environment .
- measure the qos parameters of IPv4 and ipv6 for IEEE802.11 a, n.
- compare the proposed scenarios IPv4 and ipv6 for IEEE802.11 a, n with other.
- evaluate either network scenario that batter for VoIP packets transmission .

## **1.3 Methodology**

this research aimed to study, analyze and simulate VoIP over wlan, to explore the quality of service of VoIP over wlan in term of (jitter, delay and throughput). to materialize these objectives, two phases is applied, phase one: OPNET software

program is used to implement and simulate VoIP over wlan network, and phase two: exploring results in term of tables and graphs .two standards of wlan is used to analyze the performance of different networks in the simulations, these standards are data rate 54 mbps 802.11a and 600 mbps 802 .11n, the network consists of different number of nodes and simulation time 240sec.

## **1.4 Project scope**

in this research analyze and simulate VoIP over wi-fi IEEE802.11 a, n, to explore the quality of service of VoIP over wi-fi IEEE802.11 a, n in term of jitter, delay and throughput. We also analyze the traffic behavior in each standard to determine which is best to use.

## **1.5 Thesis outline**

this research composed of five chapters there outline are as follow:

- chapter 1: an introduction to research idle and small background of voice over ip over wi-fi (IEEE802.11 a, n).
- chapter 2: literature review and related work for VoIP over wi-fi (IEEE 802.11 a, n) in (IPv4 & IPv6) network .
- chapter 3: QoS factor and the methodology of applied scenarios of simulation design.
- chapter 4: results and discussion of comprises of (IPv4 & ipv6) wi-fi (IEEE802.11 a, n) refer to throughput, delays and jitter.
- chapter 5: conclusion and remarks presented the conclusion of the research along with the recommendations from this thesis.