

الاستهلال



قال تعالى في محكم تنزيله:

(قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ)

صدق الله العظيم

سورة البقرة الآية (٣٢)

## **DEDICATION**

This thesis is dedicated to my parents,  
my husband and to all other members of  
my family.

## **ACKNOWLEDGEMENT**

My thanks are to god who enabled me to do this work.

Furthermore I would like to extend my thanks to all who stood beside me to make this research, but I give my special thanks to my supervisor Dr: Fath Elrahman Ismael Khalifa for his valuable help and support.

## المستخلص

مستقبل الاتصالات سوف يعتمد علي الشبكات اللاسلكية نتيجة للتطور السريع للتكنولوجيا. لذا التقنيات اللذان تم إختيارهما لهذا المشروع هما تقنية البيئة المشتركة العالمية للوصول عبر المايكرويف وتقنية الشبكات الاسلكية محلية النطاق وهما نماذج لشبكات غير لاسلكية.

في نظم الإتصالات الحديثه هنالك تحديات تواجه جودة خدمة الشبكات اللاسلكية تتمثل في (التأخير الزمني ،عدم التزامن ،ضياع الحزم،الإنتاجية أو قدرة النظام).

جودة الحزمه تواجه مشاكل بزيادة عدد المستخدمين لذلك نحتاج لدراسة وتقييم تلك المشكلات بغية إيجاد حلول مناسبة لها .

الهدف من هذا المشروع هو تقييم اداء تقنية البيئة المشتركة العالمية للوصول عبر المايكرويف وتقنية الشبكات الاسلكية محلية النطاق من خلال عقد المؤتمرات عبر الفيديو باستخدام تقدير ادوات هندسة الشبكات المثلى لمقارنة أداء ومقدرات الشبكتين وإيجاد الحل الأمثل.

في هذا البحث تم مقارنة تقنية البيئة المشتركة العالمية للوصول عبر المايكرويف وتقنية الشبكات الاسلكية محلية النطاق بالنسبة لمعاملات جوده خدمه عقد المؤتمرات عبر الفيديو لتقييم الاداء بزياده عدد المستخدمين في كل مره مع تثبيت كل العوامل الأخرى.

نتيجة التقديرات اثبتت أن الإنتاجية أو قدرة النظام زادت بنسبة (84.7%) وكانت نسبة فقدان البيانات في تقنية الشبكات الاسلكية محلية النطاق هي (٦٤.٤%) وفي تقنية البيئة المشتركة العالمية للوصول عبر المايكرويف هي (٩٢.٤%) وذلك عند زيادة عدد المستخدمين .

# ABSTRACT

Due to the fast development of technology, future communication and transmission are going to depend upon wireless networks. So the two technologies chosen in this project (WiMAX and WiFi) are examples of typical wireless networks.

In today's wireless communication systems there are challenges regarding wireless networks quality of service (QoS) issues like delay, delay variation, packet loss and throughput. The (QoS) faces problems by increasing the number of users so there is need to study and evaluate those problems and find better solutions.

The aim of the project is to evaluate the performance of WiMAX /WIFI networks by streaming a videoconference on OPNET simulation program and compare between the performance and capabilities of the two networks to find the best solutions in maintaining and deploying them.

The two wireless networks are compared in different parameters for each one according to their reference model. The application used as main traffic is the videoconferencing in order to investigate the strength of each technology by increasing the number of users, other attributes in the simulation environment unchanged.

Simulation results show that throughput is higher in WiMAX by 84.7% as the number of users increased, the traffic loss in WiFi is (64.4%) while in WiMAX is (92.7%) when the number of users is increasing.

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## ABBREVIATIONS

AES	Advanced Encryption Standard
AP	Access Point
AEC	Acoustic Echo Cancellation
BS	Base Station
CPE	Customer Premise Equipment
CPM	Continuous Presence Mode
DES	Data Encryption Standard
DSL	Digital Subscriber Line
EAP	Extensible Authentication Protocol
FDD	Frequency Division Duplexing
FDM	A frequency-Division Multiplexing
FDM	Frequency-Division Multiplexing
FFT	Fast Fourier Transform.
IEEE	Institute of Electrical and Electronics Engineer,
IP	Internet Protocol
ISI	Inter Symbol Interference
LAN	Local Area Network
LANs	Local Area Networks
LLLC	layers Logical Link Control
LOS	Line-of-Sight
MAC	Media Access Control layer
MANs	Metropolitan Area Networks
MANs	Metropolitan Area Networks
MCU	Multipoint Control Unit

MCU	Multipoint Control Unit
MP	Multipoint Processors
MC	Multipoint Controller
NLOS	Non-line-of-sight
OFDM	Orthogonal Frequency Division Multiplexing
PAPR	Peak-to-Average-Power Ratio
PD	Packet Delay Variation
PDA <sub>s</sub>	Personal Digital Assistants
PDA <sub>s</sub>	Personal Digital Assistants
PHY	Physical layer
POTS	Plain Old Telephone System
QoS	Quality of Service
RTTP	Manages Real-Time Transport Protocols
RTTP	Real-Time Transport Protocols
SFN <sub>s</sub>	Single Frequency Networks
SS	Subscriber Stations
TDD	Time Division Duplexing
TOS	Type of Service
UDP	User Datagram Packets
VC	Videoconferencing
VAS	Voice – Activated Switch
VoD	Video On Demand
VUI	Videoconferencing User Interfaces
WCDMA	Wideband Code Division Multiple Access
WEP	Wireless Equivalent Privacy
WEP	Wireless Equivalent Privacy

Wi-Fi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access
WLAN	Wireless Local Area Network
WLAN	Wireless Local Area Network
3G	Third Generations
4G	Fourth Generation
E2E	End-To-End