

Dedication

*Personally, I'd like to thank all those who have helped with
... their advice and efforts
To the tender fountain planted in my ambition and
perseverance My father dear
To the inexhaustible tenderness ... My mother dear
To those with their eyes memories of my childhood and
my youth My Brothers and My sisters
To the spirit that lived in my soul dear wife, and my flower
life
.For my parents, friends and everyone, I offer my research
... To all who around me and supported me
... To all who I forgot to mention*

With love

ACKNOWLEDGMENT

*All thanks to Allah; who helps us to do what
we couldn't do without his assistance. First, I am
deeply indebted to my supervisor Dr. Abd Alrasoul
Gabbar Zubidi , for his constant support. Without
.his help, this work would not be possible
I would like to thank my parents for allowing me to
realize my own potential. I would like to thank my
.family for their support*

I dedicate this thesis to my mother and father. *I would like to thank the Center of Engineering Studies (CETS) family. Lastly, I owe a great many thanks to a great many people who helped and supported me during the writing of this research*

Abstraction

This project will explain the technology transfer voice over the Charter of the web defined and how they work and what are the types of equipment needed to work with the technical explanation of the technical advantages and disadvantages and challenges faced by the technology. The importance of Voice over Internet Protocol and it came as an alternative to the telephone network, the traditional flexibility and led to lower the cost of communication, especially international and because it is easy to use and the offering of features and additional services to facilitate the user performance of the communication in an effective manner and must work to develop and find appropriate solutions to provide this service with high quality. But the application is not easy as it should be on institutions and companies before starting the application process, taking into account the difficulties of the application with the

study of the features and benefits that would accrue to them from it. And also must take into consideration the quality of service (delay - Availability - tension - Reliability - Security).

As the Voice over Internet Protocol is a relatively new technique, it is natural and there are some gaps and disadvantages that there are no solutions have so far. So, they are so far not considered the ideal alternative to traditional phone. And this research is an attempt to provide some of the basics of Voice over Internet Protocol.

تجريد

في هذا المشروع تم شرح تقنية نقل الصوت عبر ميثاق الشبكة وتعريفها وكيفية عملها وأنواعها وما هي المعدات اللازمة لعمل التقنية مع شرح مزايا التقنية وعيوبها والتحديات التي واجهتها التقنية. وتنضح أهمية تقنية نقل الصوت عبر بروتوكول الإنترنت أنها حلت كبديل لشبكة الهواتف التقليدية لمرونتها وأدت إلى خفض تكلفة الاتصال وخصوصاً الدولية وما تقدمه من مميزات وخدمات إضافية تسهل على المستخدم أداء الاتصال بطريقة فعالة فيجب العمل على تطويرها وإيجاد الحلول المناسبة لتقديم هذه الخدمة بجودة عالية. ولكن تطبيقها ليس بالأمر السهل إذ يجب على المؤسسات والشركات قبل البدء بعملية التطبيق الأخذ بعين الاعتبار صعوبات التطبيق مع دراسة المميزات والفوائد التي قد تعود عليهم منه. وأيضاً يجب الأخذ بعين الاعتبار تحقيق جودة الخدمة (التأخير - التوافر - التوتر - الاعتمادية - الأمان). بما أن نقل الصوت عبر بروتوكول الإنترنت يعتبر تقنية جديدة نسبياً، فإنه من الطبيعي وجود بعض الثغرات والمساوئ التي لم توجد لها حلول حتى الآن. لذا، فهي حتى الآن لا تعتبر البديل الأمثل للهاتف التقليدي. و يعتبر هذا البحث محاولة لتقديم بعض أساسيات تقنيات نقل الصوت عبر بروتوكول الإنترنت.

CONTENS

الآية

Dedication	I
Acknowledgment	II
Abstract	III
تجريد	IV
Table of contents	V
List of figures	X
List of tables	XI
List of abbreviation	XII

CHAPTER ONE: INTRODUCTION

1.1	Overview	1
1.2	Background	3
1.3	Problem statement	4
1.4	Objective	6

1.5	Methodology	8
1.6	Research Outlines	14
CHAPTER TWO: LETERATARE REVIEWS		
2.1	The meaning of VOIP	15
2.2	The functions of VOIP	17
2.2.1	Procedure VOIP call	17
2.2.2	History of VOIP	19
2.3	Technology, standards and challenges	21
2.3.1	Protocols	22
2.3.2	(H.323 and the Session Initiation Protocol (SIP	24
2.3.3	Codecs	24
2.3.4	Implementing VOIP factors	25
2.3.5	Voice Quality	26
2.4	The main technical issues for voice services over an IP network are	26
2.4.1	Transporting the voice call packets over the network	26
2.4.2	(Quality of Service (QoS	27
2.4.3	Peer-to-peer networking	28
2.4.4	Nodes (its peers) as to be consuming them from other nodes	28
2.4.5	Running	29

2.4.	Packet Shaping	30
6		
2.5	Altogether, leading to the end of network neutrality	31
2.5.	Application convergence	32
1		
2.5.	VOIP and multimedia	32
2		
2.6	Persistence	32
2.7	Wireless VOIP	33
2.8	The Advantages and Disadvantages of VOIP	34
2.9	Future developments	38
2.9.	VOIP and Identity	38
1		
2.9.	Pay-for services	38
2		

CHAPTER THREE: HARDWARE DESIGN

3.1	Hardware Organization and Implementation	40
3.1.	DTMF Generator/Decoder	40
1		
3.1.	D-25 Male Connector	42
2		
3.2	The Registers	45
3.3	Latch 74373	45
3.4	ULN 2001A Darlington pair	46
3.4.	DC Motor	46
1		

3.4. 2	Relay	47
3.4. 3	LED's	47
3.5	Design Concepts And Of Operation	48
3.6	Cellular Mobile Block	48
3.7	DTMF Decoder Block	49
3.8	Personal Computer Block	51
3.8. 1	Latching Block	51
3.8. 2	Darlington Pairs Block	52
3.9	Design Steps	56

CHAPTER Four: RESULTS AND DISCUSSIONS

4.1	Vulnerabilities of VOIP	57
4.1. 1	(SPAM over Internet Telephony (SPIT	57
4.1. 2	Voice Tapping	57
4.1. 3	Toll Fraud	57
4.1. 4	Identity Fraud	57
4.1. 5	Lack of Security Methods and Tools	57

4.2	Reliability of VOIP	58
4.2.1	Network Connection	58
4.2.2	Software Reliability	58
4.2.3	Link Failure	58
4.2.4	Quality of Service	58
4.2.5	Network Design	59
4.3	Limitations of VOIP	59
4.3.1	Access to Local 911 Services	59
4.3.2	Loss of Power	59
4.3.3	Line Echo	59

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1	Conclusion	61
5.2	Recommendations	63
	REFERENCES	64
	APPENDIX	65

LIST OF FIGURES

Page	Description	Figure
8	Voice over IP application diagram	1.1
9	VOIP technology used exclusively for the exchanging of calls among different premises of the same enterprise	1.2
10	VOIP technology merged with a traditional telephone network	1.3
10	VOIP-only technology for the telephone network	1.4
12	Some of renowned companies of the VOIP business	1.5
13	Some of renowned companies of the VOIP business	1.6
15	VOIP general idea	2.1
42	Tone Frequency '1' key	3.1
43	Parallel Port Signal Lines	3.2
53	Logic diagram of ULN 2001A	3.3
54	Block Diagram of the controller circuit	3.4
55	Circuit design of remote control	3.5

LIST OF TABLES

Page	Description	Table
-------------	--------------------	--------------

		S
22	VOIP Protocol stack and comparison with the OSI model	2.1
41	DTMF General Frequencies	3.1
44	D-25 connector 3-2	3.2
45	Parallel Port Address	3.3
50	MT8870 Output Truth Table	3.4
52	Function Table of HD74LS373	3.5
53	Output characteristics of ULN2001A	3.6

LIST OF ABBREVIATIONS

Voice Over Internet Protocol	VOIP
Dual Tone Multi Frequency	DTMF
Public Switched Telephone Network	PSTN
Quality of Service	QoS
Internet Engineering Task Force	IETF
International Telecommunications Union	ITU
Global System for Mobile Communications	GSM
Session Initiation Protocol	SIP
Realtime Transport Protocol	RTP
User Data Protocol	UDP
Private (Automatic) Branch Exchange	PABX
Asymmetrical Digital Subscriber Line	ADSL
Wireless Fidelity	WiFi
File Transfer Protocol	FTP

Transmission Control Protocol	TCP
Perr-to-Perr	P2P
Early Steering	Est
Internet Protocol	IP
User Datagram Protocol	UDP
Internet Engineering Task Force	IETF
Service Oriented Architectures	SOA
Post Office Telephone Systems	POTS
Personal Digital Assistant	PDA
Dual Tone Multi Frequency	DTMF
Caller Identification	CID
Personal Computer	PC
Universal Mobile Telecommunication System	UMTS
Internet Service Provider	ISP
Local Area Network	LAN
Integrated Services Digital Network	ISDN
Private Branch Exchange	PBX
Joint Academic Network	JANET
Wireless Local Area Network	WLAN
Hyper Text Transfer Protocol	HTTP
Graphical User Interface	GUI
Information And Communication Technology	ICT
Further And Higher Education	F&HE
Instant Messaging	IM
Short Message Service	SMS
Radio Frequency	RF
Frequency Modulation	FM
Integrated Circuit	IC
Electromagnetic Field	EMF
Light Emitting Diode	LED
Universal Link Negotiation	ULN
Reservation Protocol	RSVP
SPAM Over Internet Telephony	SPIT
Interactive Voice Response	IVR
Internet Relay Chat	ICR
Worldwide Interoperability for Microwave Access	WiMAX
Open Systems Interconnection	OSI
RTO Control Protocol	RTCP