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Distance Varieties Wireless Signals Relations Connected Peer to Peer Computers

Kamaran HamaAliFaraj
Department of Computer, College of Science, Cihan university – Sulamani,KRI
Department of Computer, College of Science, Sulamani university – Sulamani,KRI
kamaranfaraj@yahoo.com
Banar Fareed Ibrahim
Department of IT, College of Science, Lebanese French University, Erbil, IRAQ-KGI
bnar.fareed@lfu.edu.krd
Azhi A. Salih
Department of Mathematics ,college of Basic Education ,Salahaddin university ,Erbil,IRAQ-KGI
azhi.salih@su.edu.krd

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ABSTRACT

Static website by hypertext markup language (HTML) published over a computer networks with the wireless distances variety are connected by peer-to-peer as a client/server(C/S) based network. The evaluating test started from distanced of (twenty meters, forty meters, sixty meters and up to hundred meters) between both points with the communication media guide-wire and unguided-wireless. In phase-1 (guide-wire evaluation) testing for three different distances between both C/S computers which are (20 meters, 40 meters, 60 meters). Each mentioned distances which tested and record different result. The phase-2 (unguided-wire evaluation) wirelessly for three different distances between both C/S computers which are (20 meters, 40 meters, 60 meters). The network Quality of Service (QoS) in private Network (PRN) or peer to peer (P2P) network is in different distances discovered. The private wired and wireless networks utilized in our proposed system and the performance latency of website will be determinate for the reason of solving traffic/bottleneck problem. The designed constant size of static website-html and installed on Server-side, also connected in different length of (cable UTP or wireless) to several clients in order to test and discover lowest response time. QoS will be finding out in least response time in Network different distance wire and wirelessly with a proper solution in right distance.

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1. INTRODUCTION

The consideration WLANS allow users in a local area, such as a university campus or library, to form a network or gain access to the internet. Also Performance or Latency by response time is an important factor and hot topic in the world of computer communication and networking [1]. The ways people and devices connect to the Internet have changed significantly in recent years. Numerous highly capable wireless networking technologies have been developed and widely deployed. Today's commercial wireless communications landscape is operating a revolution in the way people access and share information [2]. In this paper concentrate variety distance is up to hundred meters to connect computer1 and computer2 wired and wirelessly methods. The recent society we live in relies heavily on communication [3] is a wireless more than before. A computer network consists of a number of computers joined together for the purpose of communicating and sharing resources [4]. Wireless networking takes into consideration the range, mobility, and the several types of hardware components needed to establish a wireless network [5], the range of distance between two points wirelessly and wire connected is under investigation by performance (time response). The least response time with longer distance is a target for both methods of communication. Thus, the result test of distance time-consuming between two connected computers with least response will be an appropriate solution for our paper. A temporary network can be formed by a small number of users without the need of an access point [6], and protocols needed for optimum performance. In the proposed configuration of wireless networks with peer to peer LANs-private network and with wired and wireless methods. Proposed wired private and wireless private network as multipoint is shown in Figure (1).

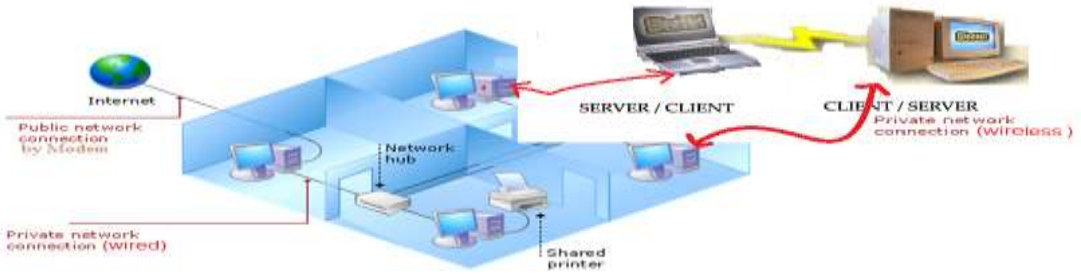

Figure (1) proposed private-wired and private-wireless Networks as multipoint

Since our main objective is to advise on the LAN requirements of a prototype real-life business and fine best result in the respect of least response time with longer distance. We aim at producing an informed report on the LAN needs of any business. In order to do this, the network designer must understand how computers communicate in two different phases namely one and two. The two phases were mentioned in the previews section. The figure (2) Show the phases unguided and guided communication in only two points, and it is suitable for our evaluation. The paper starts with the background used for this research. Then, a brief description of the system performance as well as the trial that took place, subsequently a

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discussion of the survey results is present. Finally, paper finished with a summary and conclusions.

Figure (2) phases unguided and guided proposed communication in only two points

2. BACKGROUND

Network or Networking of computers has an important role in nowadays society; from past until now there are lots of modifications occurred in Computer networks and create new computer networks generation. Each generation has improved the computer networks performance [5]. Thus, the performance and computer generation have a direct relation between them. Increasing of performance is a hot top in networking science and technology. each modification in performance network is creating new generation; for example Two decades ago, few people had access to a network. Now, computer communication has become an essential part of our infrastructure. Networking computer are everywhere and used in Government, Education, Commerce, military [6] and etc. The popularity of computer network is returned to several aspects; time, space, distance, better quality of service (QoS), Speed, power, real time activity [6] and etc.

The unguided networked houses or offices the make smarter house or smarter office, but it's not grantee for the better security than the guided network or designs for maximizing QoS in complex networks must end with several important criteria [7]. An operational perspective is the ability of the network to service an application effectively, without affecting its performance and functionality [8]. The most important criteria are performance, reliability and security. The performance criteria are mostly considerate for evaluation the speed of wired and wireless network in our proposed system, in this paper the performance is a selected criteria for testing and evaluation for guided and unguided point to point network in different distance. The distance is variable:

2.1. PERFORMANCE

Investigation for wireless and wire point to point Performance is in many techniques with transmit time and response time. Transmit time is the amount of time required for a message (i.e. open index or home page) that travel from one device to another. The response time is the elapsed time between an inquiry and a response. The response time is the elapsed time between end of enquiry and the beginning of the response [9] (i.e. the response time in our proposed system is the inquiry start the ping to server domain name by client until beginning of response. it's end of ping the domain name and beginning of response.). The figure (3) Show the performance by response time by elapsed time between end enquiry and the beginning of the response.

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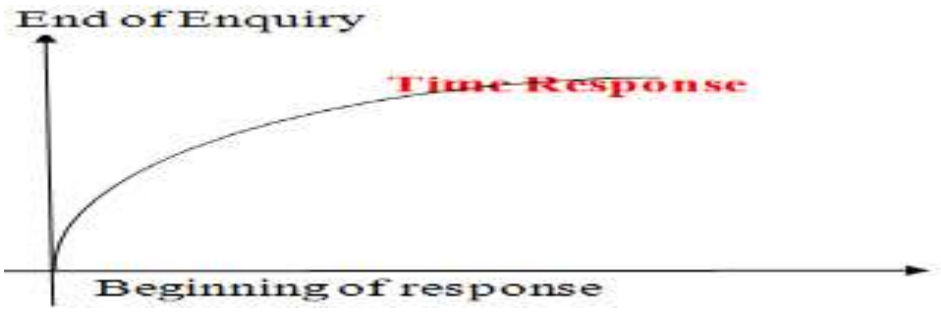

Figure (4) requesting time by elapsed time between end requesting files Transfer and starting files transfer

The performance of a network depends on a number of factors, including the number of users, the type of transmission medium [9] either wire or wireless. The capabilities of the connected hardware and the efficiency of the software [9] are very important factor to increase the performance. The better hardware capability and software efficiency improve the response time. But in this paper are only two (connected guided and unguided) stations, and used two different IP. Thus, the investigation is for the limited performance with variable distance.

3. MEASUREMENT TECHNIQUES AND TOOLS

The reliability of wireless communication deteriorates due to many factors such as interference, path loss and blockage. One of the most likely sources of wireless communication errors is fading [10]. In order to find out the fading of wireless and wire communication signals with different distance will be an investigation of the paper. For that reason the performance measurements could be done by a tool is commonly used for example Ping is very commonly used tool for network. Availability and round-trip delay are measured by Ping and used for our process system in order to test all performance aspect. Ping is the name of a software utility originally written by Mike Muuss [11]. In wireless and wire communication; the time needs it takes a "packet" of data to travel from client computer to a server on the Internet and return is calculated by Ping measurement. The fading signal is occurred by delayed responses in Internet applications - this is possible due to a higher than preferred ping (e.g. packet loss is lesser will be better when it comes to ping). The best to use is a very good suggestion to use echo request and echo reply messages to check if the remote host is reachable or not, that is, there is a network connection from the local host to the remote host. The ping command is a very easy way to confirm that your computer connection is active and run a ping test to ensure connectivity. In order to receive a four-line return and a synopsis explaining how much data was transferred from the remote domains and how quickly. There is some important information about ping. This information is very important for verify time in millisecond:

The figure (5) shows all steps from start button to DOS prompt.

1) Select to Start. 2) Click on Run. 3) Type COMMAND and click OK. 4) Once the DOS prompt comes up type the following:

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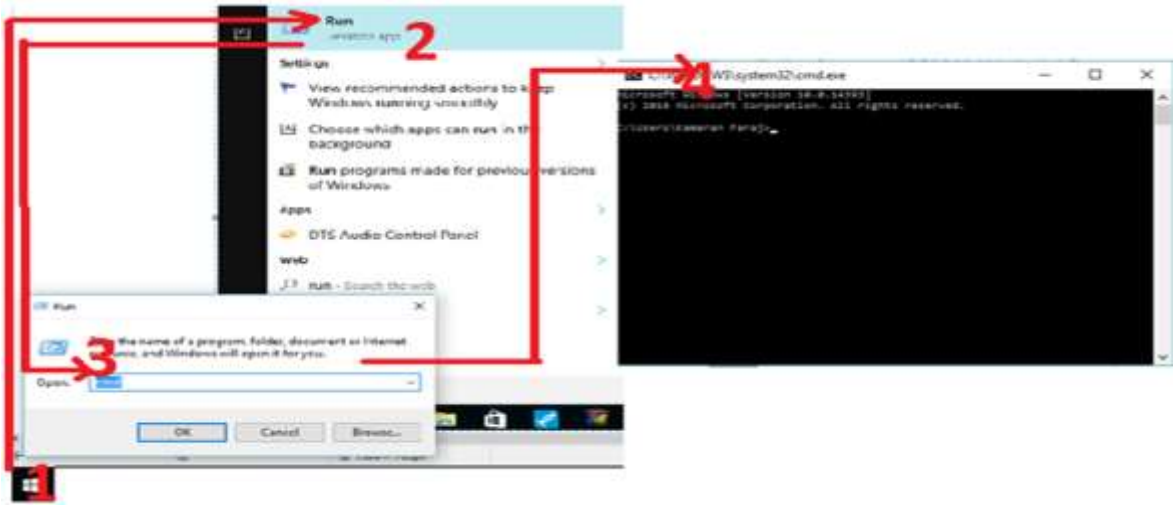

The Figure (5) shows all steps from start button to DOS prompt.

 ping 192.168.0.1 [enter] ping 63.72.108.225 [enter] ping cihan.krd. [enter]

The black screen of MS DOS-prompt appear with all information about the connected client to server and vice versa.
All Steps Complete. And all information are shown as below about ping in table (1) [10].
In order to find network latency statistics [8], the activity need to be performed on any connected and worked network for determination measure and evaluate network latency over time, and during different periods of the day to capture a representative sample of typical network activity. This will be able to by analysing the return delay from a distant computer with the ping command. Return delay times, measured in milliseconds, will be summarized by computing the average latency (mean) and the range (maximum and minimum) of the delay times.

The ping is a useful for any network activity or finds out the best performance, also can be used to calculate the round-trip delay to the remote host. Ping software is working as open source, which has resulted in the software that supports almost every OS [12]. The index or home page designed as a static and Ping is the measurement of time taken for home or index page to travel from one point to another over a network.
For example, Speed of information traveling from client computer to a server or appearing the index page by client computer, thus traveling from any client to a server (down load a website by any client). A 'ping' estimates a round trip time using interval timing responses and will generally give a result that's measured in 'milliseconds'.

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Table (1) describes all ping information and applications that used for designing proposed system[11].

Ping information	Description
Sent/received:	Total number of packets sent and received
Packet loss (%):	Packet loss in percentage.
Min resp. time:	Minimum response time in milliseconds.
Max resp. time:	Maximum response time in milliseconds.
Average resp. time:	Average response time in milliseconds.

4. TESTS AND EVALUATION

The Measurement techniques and tools is Ping for evaluation of our proposed system. The measurement of time taken for information to travel from one point to another over a network is achieved to analyse best result between guided and unguided in the respect of distance.

4.1. TWENTY METERS DISTANCE:

The results of ping test shows in Figure (6a) by command prompt for wired communication between server and client. Ping between two computers in an (peer to peer wired LAN), one of them is server with the IP first computer is a server 192.168.1.1, and the other are clients with IP second computer is a client 192.168.1.2.
However, in Figure (6b) by command prompt for wireless communication between server and client. Ping between two computers in an (peer to peer wireless LAN), one of them is server with the IP first computer is a server 192.168.1.1, and the other are clients with IP second computer is a client 192.168.1.2

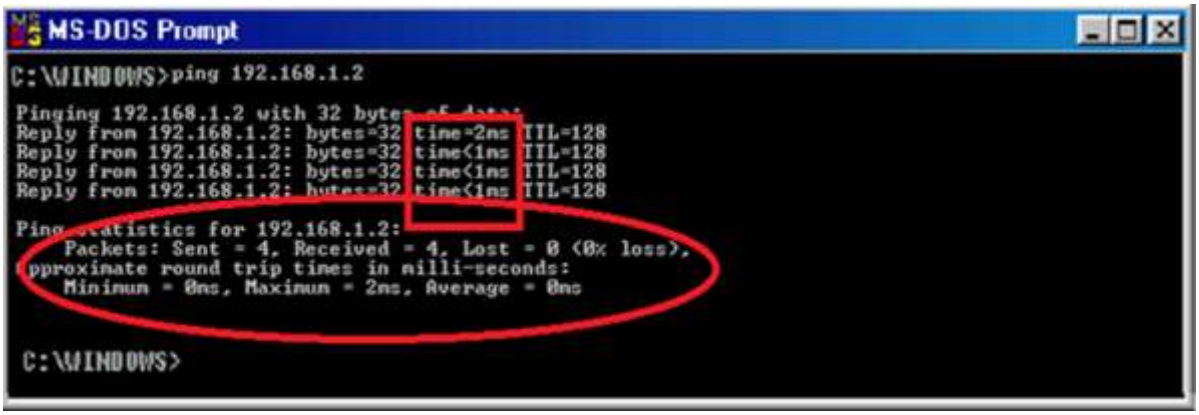

Figure (6a) test result of wire peer to peer LAN in ping by prompt command

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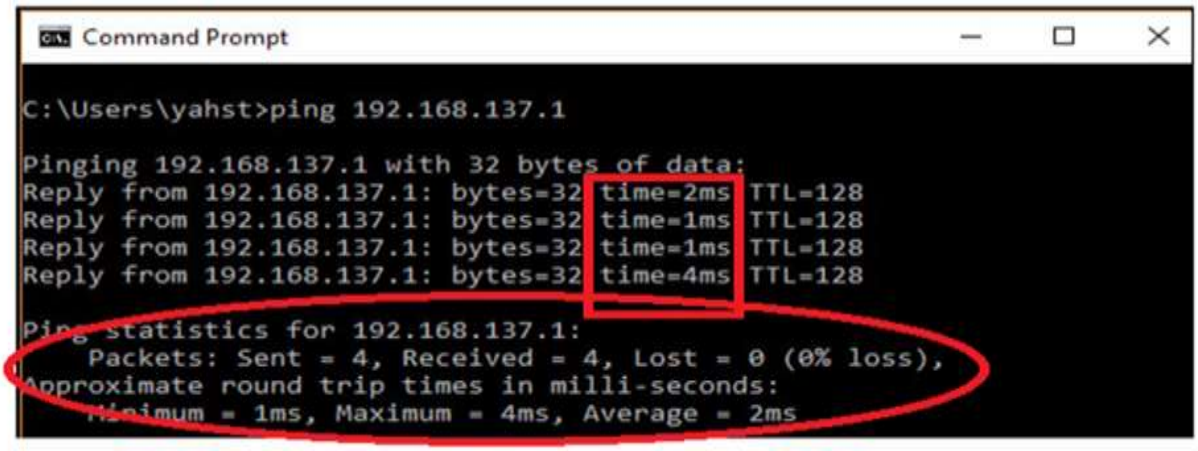

Figure (6b) test result of wireless peer to peer LAN in ping by prompt command

There must be different between two results ping test show witch one of them is better private network (wire or wireless) in the distance of twenty meters. The result of private network-wired is better than the private network-wireless with constant distance of twenty meters between client and server. In general, the response time of the private network-wire is lesser than the private-wireless network (LAN). The private network-wireless (LAN) is very limited up to sixty five meters, but the private network-wire (LAN) distance is up to hundred meters. The results show that private network-wire (LAN) is less than the private network-wireless (LAN) in the fixed distance of twenty meters. All information are shown as below about ping reply milliseconds (ms) for private wire and wireless network LAN in table (2).

Table (2) describes all ping reply for private Wire and private Wireless network.

Private Network- Wire LAN			Private Network-wireless LAN	
ping reply (ms)	amount		ping reply (ms)	amount
reply one	2		reply one	2
reply two	1		reply two	1
reply three	1		reply three	1
reply four	1		reply four	4

The table evaluation tests show a different between private Network-Wire LWAN (PNWrL) and Private Network-Wireless LAN (PNWlessL). In PNWrL the suitable distance limitation between client and server is hundred meters, but the distance limitation between client and server approximately sixty five meters. The time response of PNWrL is much better than PNWlessL because the signals easily reach more than hundred meters, but PNWlessL signal difficultly reach to sixty five meters. This mean that after sixty meters the signal will be weak and cause a communication problem but in wired after hundred meters the signal is weak. Figure (7) show the ping result for PNWrL with distance twenty meters, PNWlessL with distance twenty meters.

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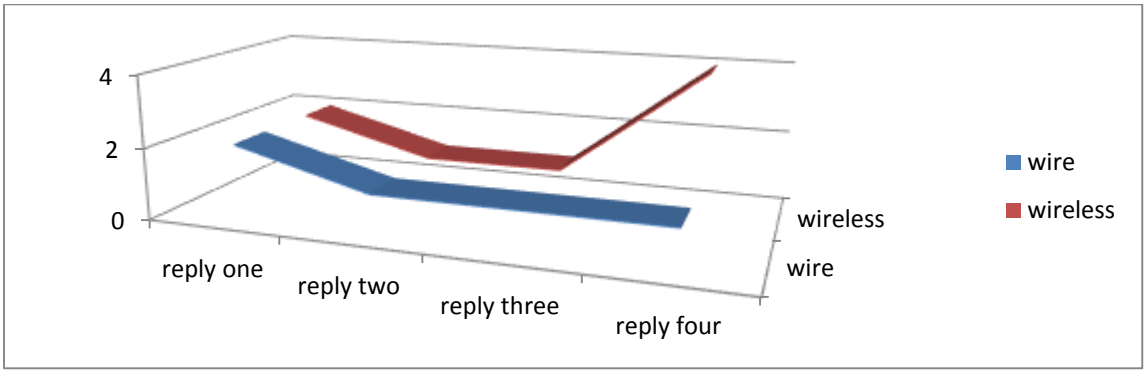

Figure (7) show the ping result for PNWrL with distance twenty meters PNWlessL with distance twenty meters

All information are shown as below about ping reply (ms) for private wire and wireless network LAN in table (3).

Table (3) show the PNWrL and PNWlessL results which are same in send, received and lost for twenty meters distance.

Private Network- wire LAN		Private Network-wireless LAN	
ping statics packets		ping statics packets	
send	4	send	4
recieved	4	recieved	4
lost	0	lost	0

Finally table (4) show the approximate round trip in milliseconds (ms) for PNWrL and PNWlessL

Table (4) show the approximate round trip in (ms) for PNWrL

Round Trip approximation			**Round Trip approximation**		
Wired			**Wireless**		
Minimum	0			1	
Maximum	2			4	
Average	0			2	

Figure (8) show the round trip minimum to maximum and average for PNWrL and PNWlessL

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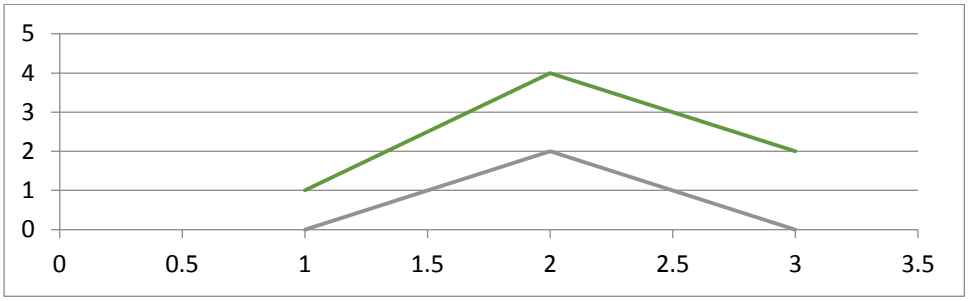

Figure (8) shows the round trip minimum to maximum and average for PNWrL and PNWlessL

All tests with twenty meters of distance between two points show the wired communication medium is better and less than the wireless medium. The round trip for wireless is not as good as wire round trip because of the table (4) declare that the limitation approximation round trip for wireless is from (1-4)-brown upper line in Fig(8), but the limitation approximation round trip for wire is from (0-2)-green bottom line in fig(8). It is an obvious the (0-2) limitation is acceptable than (1-4) limitation.

4.2 FORTY METERS DISTANCE: As mentioned before in section (4.1) the distance between two points is twenty meters. The same test will be repeated for forty meters distance and sixty meter distance. Ping between two computers in an (peer to peer wired LAN), one of them is server with the IP first computer is a server 192.168.1.1, and the other are clients with IP second computer is a client 192.168, Figure(9a) test result of wire peer to peer LAN in ping by prompt command.

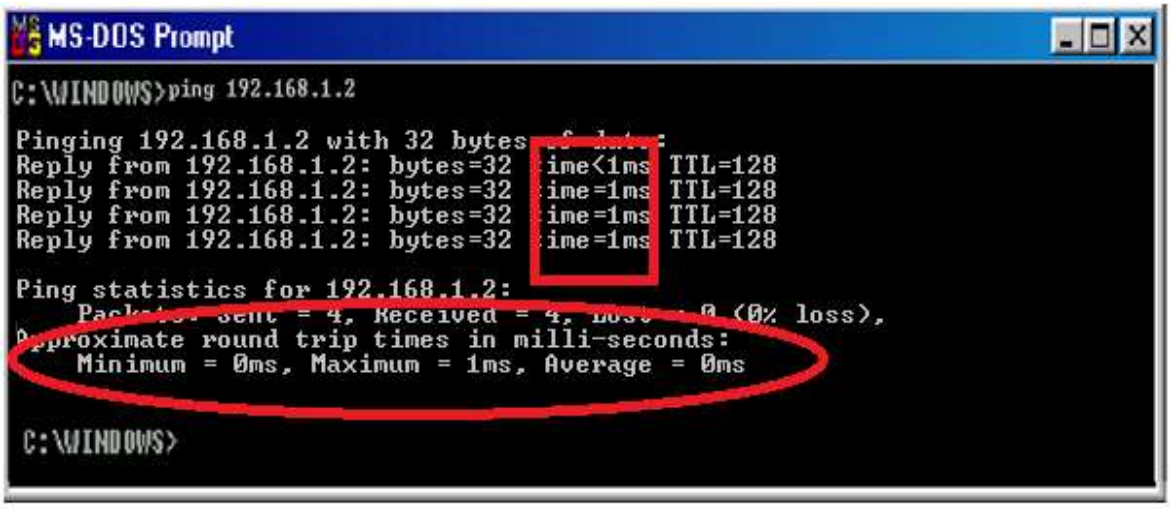

Figure (9a) test result of wire peer to peer PNWrL

However, in Figure (9b) by command prompt for wireless communication between server and client.

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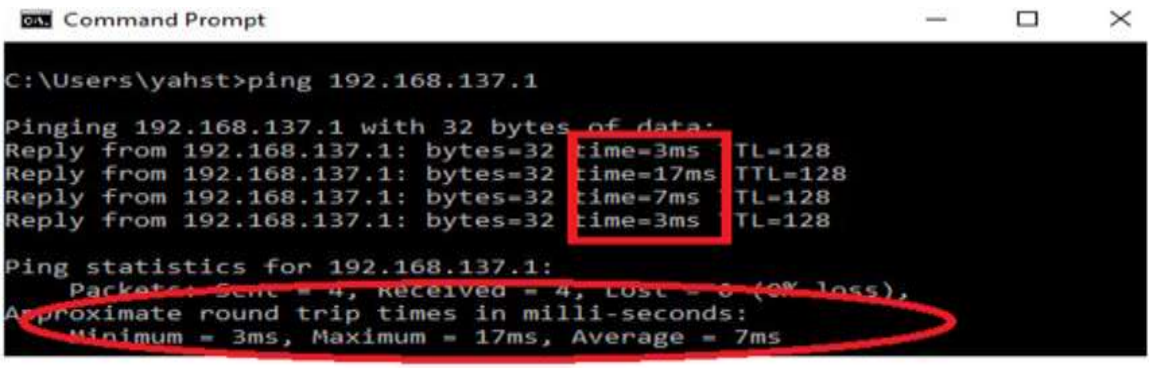

Figure (9b) test result of wireless peer to peer PNWlessL

All information are shown as below about ping reply milliseconds (ms) for private wire and wireless network LAN in table (5).

Table (5) describes all ping reply for PNWlessL and PNWrL network.

Private Network- wire LAN			Private Network-wireless LAN	
ping reply (ms)	amount		ping reply (ms)	amount
reply one	1		reply one	3
reply two	1		reply two	17
reply three	1		reply three	7
reply four	1		reply four	3

Figure (10) show the ping result for PNWrL with distance forty meters, PNWlessL with distance forty meters.

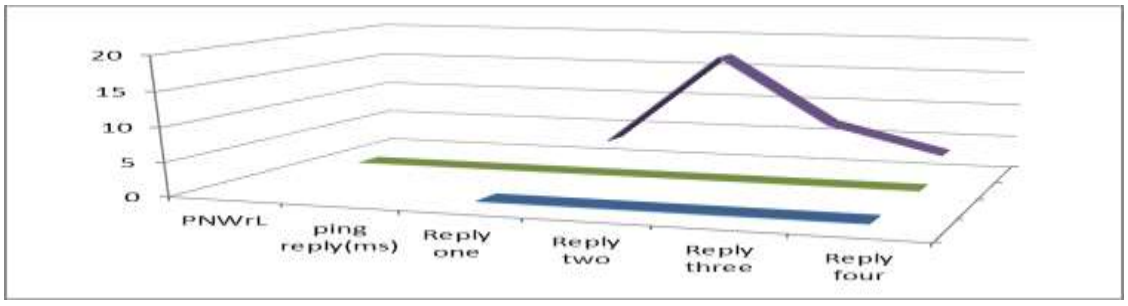

Figure (10) show the ping result for PNWrL with distance forty meters PNWlessL with distance forty meters

The figure (11) shows the highest and lowest delay time for round trip of signals between clients and server. The number in milliseconds delay time is very high if compared the PNWlessL to PNWrL. round trip approximation is shows the better in response and where to reactivate signals in order to avoid signal weakness. The weakness signals take it to account as delay time and round trip maximum approximation.

Table (6) show the approximate round trip in (ms) for PNWrL

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Round Trip approximation			**Round Trip approximation**		
Wire			**Wireless**		
Minimum	**0**			**3**	
Maximum	**1**			**13**	
Average	**0**			**7**	

When the round trip is higher than usual is cause weak signal and or delay. Hence, reactivate the signals by placing repeater hardware. In ping statistics for forty meters distance there are no lost packet in send and received and showed table (3) in section 4.1. Table (6) show the approximate round trip in milliseconds (ms) for PNWrL and PNWlessL for forty meters.

Figure (11) show the round trip minimum to maximum and average for PNWrL

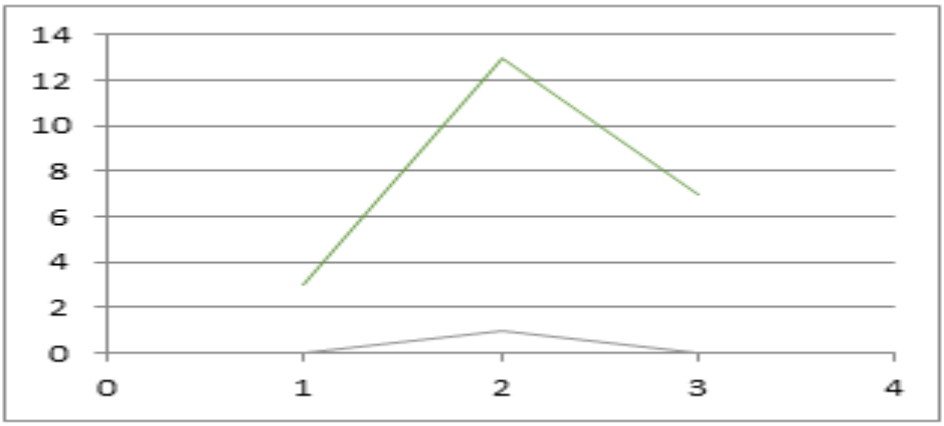

Figure (11) show the round trip minimum to minimum and average for PNWrL and PNWless

4.3 SIXTY METERS DISTANCE:

As mentioned before in sections (4.1) and (4.2) for distance the twenty and forty meters test. The same test will be repeated for sixty meters distance for both PNWrL and PNWlessL with the IP first computer a server is 192.168.1.1, and the other are clients with IP second computer is a client 192.168. Figure (12a & 12b) tests result of wire peer to peer LAN in ping by prompt command

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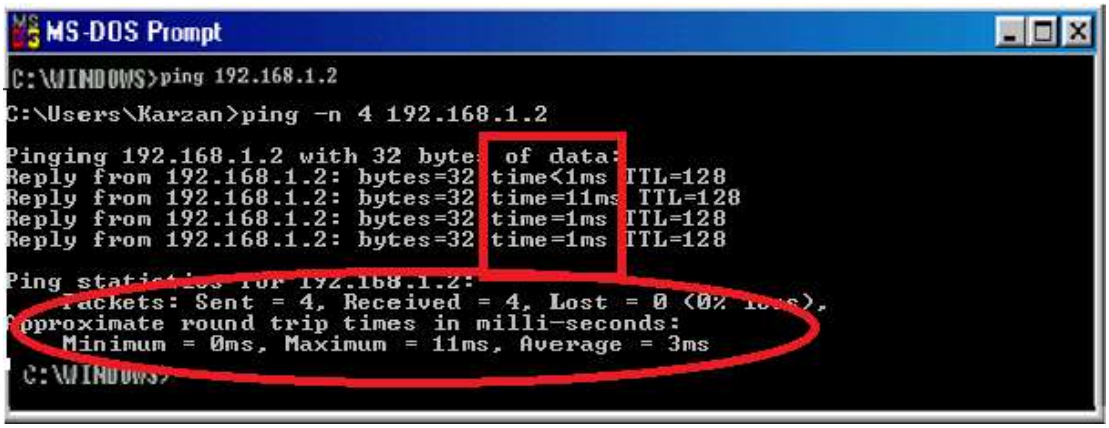

Figure (12a) test result of wireless peer to peer PNWrL for sixty meters distance

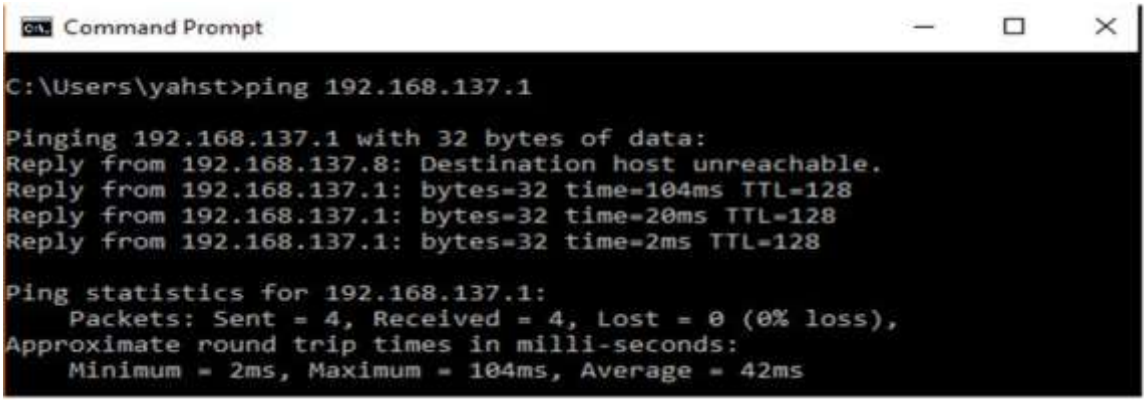

Fig (12b) test result of wireless peer to peer PNWlessL for sixty meters distance

All information are shown as below about ping reply milliseconds (ms) for private wire and wireless network LAN in table (7). The results are very different.

Table (7) show the PNWrL and PNWlessL results which are different in send, received and lost for sixty meters distance.

Private Network- Wire LAN			Private Network-wireless LAN	
ping reply (ms)	amount		ping reply (ms)	amount
reply one	1		reply one	Destination host Unreachable
reply two	11		reply two	104
reply three	1		reply three	20
reply four	1		reply four	2

Figure (13) show the ping result for PNWrL with distance forty meters, PNWlessL with distance forty meters. .

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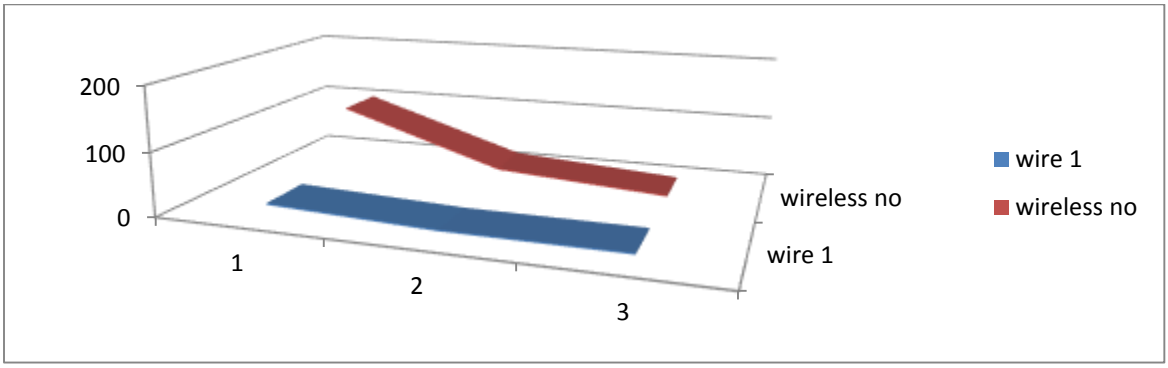

Figure (13) show the ping result for PNWrL with distance sixty meters PNWlessL with distance sixty meters

All results in wire media are reachable Distention but in wireless first reply is unreachable distention. The approximate results between them are very clear and show that the PNWrL much faster due to the distance. Table (8) show the approximate round trip in milliseconds (ms) for PNWrL and PNWlessL up to sixty meter

Table (8) show the approximate round trip in (ms) for PNWrL

Round Trip approximation		Round Trip approximation
Wire		Wireless
Minimum	0	2
Maximum	11	104
Average	3	42

The results of test for round trip from minimum to maximum are affected by the distance and number of users. The higher number of users make the approximate round trip is higher, also longer distance make the approximate round trip is higher too. The number of users is effect of round trip in a proper LAN either PNWlesL or PNWrL. Nevertheless, the consideration is on distance between two points which are clients and server. Factors are seriously caused a signal fault or weak signal is destination between CS and Number of users (Clients). The similarity of PNWrL and PNWlessL results in packet sent, packet received and packet lost.

Figure (14) show the round trip minimum to maximum and average for PNWrL and PNWlessL.

The figure (14) shows the highest and lowest delay time for round trip of signals between clients and server. The number in milliseconds delay time is very high if compared the PNWlessL to PNWrL. round trip approximation is shows the better in response and where to reactivate signals in order to avoid signal weakness.

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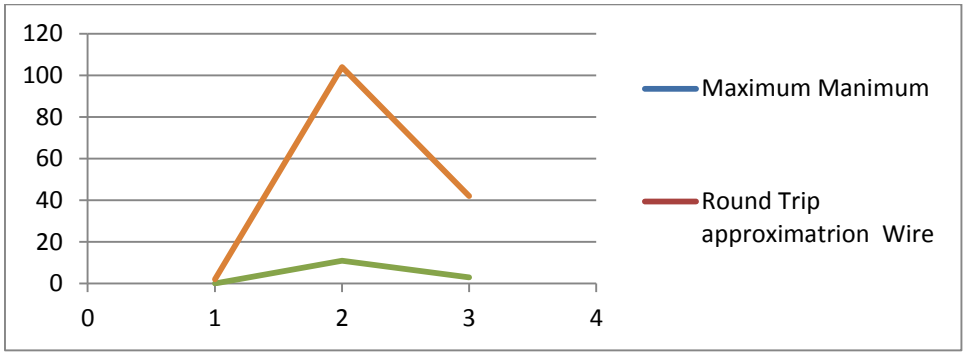

Figure (14) show the round trip minimum to maximum and average for PNWr and PNWless

The weakness signals take it to account as delay time and round trip maximum approximation. When the round trip is higher than usual is cause weak signal and or delay. Hence, reactivate the signals by placing repeater hardware. In ping statistics for forty meters distance there are no lost packet in send and received and showed table (3) in section 4.1.

5.Results and Discussion:

The proposed System evaluated by three seminar-evaluations; the first seminar-evaluation took place in the main seminar hall at Lebanese French University for wired and wireless communication with constant size of statics web side by hypertext mark-up language (HTML) capacity of three Mbytes with distance of twenty meters, but the second seminar-evaluation took place at computer science lecture with nearly fifty participated students for forty meters wire and wireless and constant size capacity of three Mbytes. The third seminar-evaluation took place at main corridor in information technology (IT) department is same as the previous seminar-evaluation in size capacitybut sixty meters. In all seminar-evaluations, the proposed system were calculate the results very accurate and rapidly. The Tables 4, 6 and 7 (Pages-14, 16 and 17) are test and illustrate the final calculation (result) in numeric for all evaluations. It is obvious distance has a role for communication arrival signals from start point to end point. The best result is wired communication with least distance. The sixty meters distance signal start be weak and crash wireless, but for wire is hundred meters.

6.CONCLUSIONS

Since new adjustment is introduced in the modern communication, for example LAN-wired and wireless. The ping is software that free to measure reply time, lost packet and round trip. Round trip and reply time have a direct relation to number of users. Distance and number of users are two important factors that affect the result test of round trip (Minimum and maximum) and ping reply. The evaluation is achieved for a limited number of computers in LAN-wire and wireless for windows server and clients. The accurate test result found that numbers of users and distance are affected by using of ping.

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