Implementation and adaptation of the computing crew of the English laboratory to and wireless network through Wi-Fi

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In this Investigation the implementation and adaptation of equip or calculation of laboratory Number 2 of English appear to a radio network by means of a WiFi. This will allow in first instance the elimination of wiring in the already existing equipment and to facilitate the exchange of information between academic students and of this unit of learning. It is important to indicate that at the moment the use of the technology that appears in our contemporary students, which will unquestionably facilitate between our students to have a greater interest in our unit of learning, every time the interchange of messages of text, images is promoted still more, of sounds, of grammar exercises related to the didactic units of our training programs etc. Which will contribute of way substantial and significant to reach the competitions contained in the Institutional programs of study before mentioned.

WiFi, Computer science Network, Technology. Classification JEL: L86, Q16, C88

Citation: Barberena A., Vázquez F., Ruvalcaba E., Implementation and adaptation of the computing crew of the English laboratory to and wireless network through Wi-Fi. ECORFAN Journal-Mexico 2011, 2-4: 262-280


Introduction

This research was constituted in the implementation of a wireless network through WIFI to the computing equipment that already exists in the laboratory No. 2 of the learning unit of English. Given the characteristics of this research, is consider pertinent mention that is a topic which required an exhaustive consultation of different bibliographic sources related with the wireless networks and with the particularity that was develop in a laboratory, therefore its results of measurement were practically exacts results.

The study provides a vision about the importance that nowadays have the student for technologic advances and the academic value that these represent for it significant learning. It worth to point that nowadays the use of technology is a fortress that is present in our contemporary students. And through this interchange could achieve and stimulate the competencies content in all our Institutional study programs. In the chapter 1 are quoted the antecedents with the wireless networks through Wi-Fi and Bluetooth, explain how is given the communication through no-guided transmissions, and the advantages and disadvantages of the wireless networks, the form of its infrastructure, the use and applications of these networks as well. In the chapter 2 does reference to the install process, the operation of each one of the used components and as well the implement practices and the result of the same. For the ahead, the care and dedication in this research were considering deliberately different variables in order to implement it in an objective form.

An in the understood that the research will be supported in a methodology and experimental character, is important to point and know the functionality that represent all and each one of its practices.

General and organizational structure of the IMSS Mexican Institute of Social Insurance, National
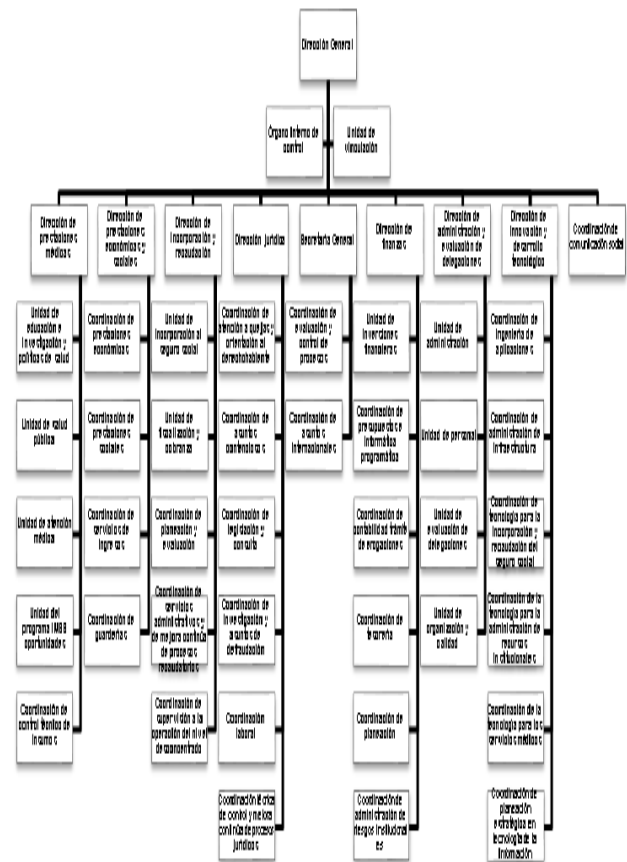
Graphic 1

General and organizational structure of the IMSS, Mexican Institute of Social Insurance, Department of Affiliation and Validityof Rights.
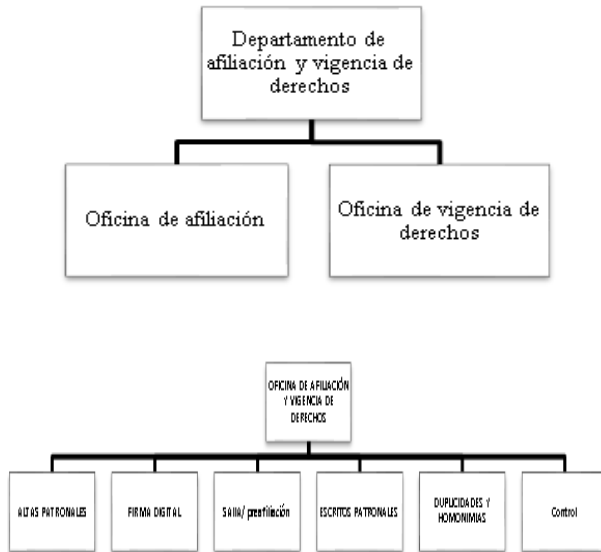
Graphic 2

Methodology

This research is practically based in a quantitative and experimental methodology in which the variables were deliberately manipulated in order to specify the adaptation and the functionality of a wireless network in the computing equipment of the laboratory No.2 of the English learning unit, of first instance was made a systematic revision of the existent equipment in the aforementioned laboratory and once effectuated this activity it made a valuation scale of the existent equipment with the intention to confirm its functionality with the one of a wireless network, which represented an innovative research and that could give the pattern for other posterior further studies.

General objective

Implement and adapt the computing equipment of the No.2 English laboratory to a wireless network through Wi-Fi.

Specific objectives

- Interchange between our students, text messages through a wireless network using Wi-Fi with the existent computing equipment in the Laboratory No.2 of the English learning unit.
- Interchange between our students, sound files through a wireless network using Wi-Fi with the existent computing equipment in the Laboratory No.2 of the English learning unit.
- Interchange between our students, images and video through a wireless network using Wi-Fi with the existent computing equipment in the laboratory No.2 of the English learning unit.
- Transmit facts with reliability and security to a functional velocity.

The multimedia world into the informatics area opens to us a big field of interaction opportunities. Images, Audio, Video, Voice are four elements which practically broken all the virtues that the world of the informatics has. A Wi-Fi network will allow us has a nice and versatile multimedia interaction, because we will interchange information, manipulate and dispose of it in any moment.

Justification

In contemporary times the technology is the spearhead for any social being, is observed as the globalization phenomenon impact in the life style of the majority of habitants in this planet.

In our Mexico the use of the technology is the daily bread, none of the habitants of this country could, not even can stay aside of the technologic development. In consequence the Polytechnic National Institute remains at the forefront with the technologic development, in virtue that in our educative Institution, develops, create and promote the investigation.

The impact of the wireless networks

"In the first instance, the manifestation of the computers networks and the internet carried with it new aspects in the behavior of the human beings and therefore appear new social problems. Nowadays the proliferation of the wireless networks and the new mobility possibilities that the technology does not end to make a light analysis in all the aspects of the human life that will be modifying with the pass of time.

While more broaden the covertures of the wireless networks, more possibilities of communication will exist accompanied of mobility every time more increasing. But at its time, that will carry new problems of security for which we should be capacitated in order to confront with adequate methods and tools. The changes in the human behavior that are origin with the manifestation of the wireless networks have a direct relation with the analysis and design of this kind of networks and there are important factors to consider about these topics during these activities".

Variables of study

- The time of life of the wireless networks adapted to the laboratoryNo.2 of the English learning unit.
- Progressive saturation of the networks (of the electronic spectrum) because the manifestation of users.

- The use of more scope is exposed to an excessive risk of interferences.
- The approximate durability of the wireless network considering the hard use of the laboratory.

Let's call hard use to have on the device that will focus in send and receive signal, this is, router, Access points, USB wireless. These devices are in reality those which will do the work. The router will send the signal to the two Access points and these at the same time will feed with signal to the Pcs of the laboratory, same that will get the signal through the USB wireless.

Generally the time of life of these devices is from 1 to 5 years, because vary between brand and brand, and also the environmental factors always influence like the dust, weather, etc. Give it 3 average years of time life but always doing emphasis that basically the time of life is of the devices not the networks.

Market rates

The market rates were many that were made to select the best equipment, functional and with better price that will cover our necessities and expectative in our project, which also should adjust to the assigned budget for such effect, keeping in the following form:

Cant	Description	Price rank/unit(average)	Average Price between both prices	
1	Router Linksys WRT310N-LA GIGABIT WIRELESS	$900.00 - $1,540.00	$1,220.00	$1,220.00
1	Access Point Linksys WAP54G HIGH SPEED 802.11G WIRELESS G	$759.40- $1,700.00	$1,229.50	$2,449.50
40	ADAPTADOR USB WIRELESS-G	$200.00- $300.00	$250.00 (*40u)	$10,000.00
1	Kit de actualization Mother Board Zotac AMD DDR1 with processor Athlon x2 a 2.8Ghz y 4Gb Ram.	$3,400.00		$3,400.00
1	Cable Ethernet RJ-45 3Mts	$50.00		$50.00
40	Cable extension hembra-macho USB Capsull3 Pack	$50.00- 80.00	$65.00(*40u)	$2,600.00
			Total	$19,669.50

Chart 1

Detail description of the devices

a) Router Linksys WRT310N-LA GIGABIT WIRELESS
b)
- Router to share internet and Switch Gigabit of 4 ports, with an incorporate system in more velocity and scope, wireless access point.

- Wireless-N technology uses multiple radios per band to create robust signals for maximum range and speed, with redTecnología.

- Much faster than Wireless-G, but also works great with Wireless-G and -B devic

- 4-port Gigabit switch delivers wired speeds that are 10 times faster than 10/100 "Fast Ethernet" connection.

- Wi-Fi Protected Setup helps make wireless configuration secure and push button easy.

- Wireless signals are protected by industrial-strength WPA2 encryption, and your network is protected from most known Internet attacks by a powerful SPI firewall.

- Easy to install on a Windows PC or Mac with Cisco Setup Wizard.

- Included Network Magic software helps manage and optimize your network.

- Includes 30-Day Free Trial of Trend Micro Internet Security software to help protect against viruses, spyware, and identity theft Incluye.

- All ports support Gigabit speed and Auto-Crossover (MDI/MDI-X) -- no need for crossover cables accomplish also with the IEEE 802.11 b, 802.11g, and 802.11n draft 2 standards and with the standart of draft of norms IEEE 802.11 b, 802.11g, y 802.11n.

b) Access Point Linksys WAP54G HIGH SPEED 802.11G WIRELESS G

- Improve the network with an Wireless-G access of 54 Mbps. Allows enlarge the network and add computers, printers and wireless equipment without cables. It is also compatible with Wireless-B equipment. The reliable connectivity allows move notebooks or put desk equipment in any place or adds access points to two independent networks and create a connectivity without cables between them.

- IEEE 802.11g allows velocities of facts until 54Mbps.
- Compatible with IEEE 802.11b equipment.
- Easy wireless configuration with the button Secure easy Set up
- Admit WPA security and WEP 64/128-bit encryption
- Configuration of IU web integrated to facilitate the process from any browser.
- Firmware upgradeable through the web browser.
- Compatible with wireless connection bridges, wireless repeater, direction MAC filter and events registration.

c) Adapter USB WIRELESS-G

- Model: WUSB54GC
- Standards: IEEE 802.11g, IEEE 802.11b, USB 1.1 y 2.0
- Channels: 802.11b / 802.11g
- LED Lights: link
- Protocols:
- 802.11b: CCK (11 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps);
- 802.11g: OFDM
- Transmitted energy:
- 802.11g: $14 \pm 1,5$ dBm (normal)
- 802.11b: $17 \pm 1,5$ dBm (normal)
- Reception sensibility :
- 11 Mbps: -87 dBm (normal)
- 54 Mbps: -71 dBm (normal)
- Security functions: encryption WEP y WPA
- Bits of security keys: 64 y 128 bits
- Principle characteristics
- Compatible with the standards 802.11g y 802.11b (2,4 GHz) Compatible with USB 2.0 with a transfer velocity until 54 Mbps with fallback automatic
- Admit encryption security WEP y WPA of 128 bits
- Admit Wi-Fi Protected Setup (WPS) to facilitate and protect the configuration.

e) Cable Ethernet RJ-45 3Mts

This kit is principally for the browser that will provide the signal to the other computers. It is for that reason that is necessary a powerful equip and with acceptable level of technology because the function that have to develop.

d) Updater kit Mother Board Zotac AMD DDR1 with procesor Athlon x 2 to 2.8 GHz y 4 GB Ram

Commonly use to connect networks, will be the link between the router and the point Access.

f) Cable Ethernet RJ-45 7.6Mts

Commonly use to connect networks, will be the link between the router and the point Access.

g) Extension cable male-female USB Capsull3 Pack

- Extension cable of facts male-female USB

- optimum transmission reducing the loss of facts

- Velocity until 480Mbps.

Chapter I

Wireless Network

Wireless network are those that communicate for a no-guided transmission media (without cables) through electromagnetic waves. Transmission and reception is made through feelers. Between the advantages that we have with the network without the necessity to use cables which allows the user mobility and also diminution in the installation costs and the maintenance of the same is compared with the conventional network.

"A wireless network is a group of computers connected through radio frequency or optical signals, without use cables, that will allow communicate and interchange information between them."[2]

"The possibilities that bring a wireless network are practically unlimited, because it possible to do all that the group of computers allows, information interchange, but with the aggregate of a big mobility and portability. The limits depend of how each computer interprets the information that get from the other and the coverture areas of the wireless network."[3]

"A system of wireless communication is a group of elements that interact between them with the objective to interchange information, without use cables."[4]

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[2] C. HILLAR GASTON. *Redes inalámbricas Wi Fi Diseño, Instalación y Configuración.* Ed. HASA, Buenos Aires 2008, p.11
[3] C. HILLAR GASTON. *Redes inalámbricas Wi Fi Diseño, Instalación y Configuración.* Ed. HASA, Buenos Aires 2008, p.12

[4] IDEM. p.13

Parts that are part of the basic model

The system of origin or emissary, at the same time composed by:

- The source. This is the equipment or device that generates the facts to transmit. For example, a PC.
- The transmitter. It is the device in charge to transform the generated facts by the source in the radiofrequency signals adequate to them get out on air to transmit the information. Generally, the signal are not transmitted from the same that were generated, therefore, they require this previous process on their way to the media. For example, a card of wireless network, a wireless router connects to an Xdsl[5]connection, etc.
- The transmission media or system. It is the air and the signals of radiofrequency use to link the system of origin with the detiNo.

The system of destination or receiver, at is time composed by:

- The receptor which is the device in charge of transform signals of radiofrequency from the air, using to transmit the information in the facts that could interpret of the destiNo. Generally the signal is not received in the same form that is transmitted, for that, it requires of this previous process on its arrived to the destination and posterior to its way for the media. For example, wirelesses card, a wireless repeater, etc.

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[5] Digital Subscriber Line - Líneas de Subscripción Digital.

- The destiNo. It is the equipment or device that receive the facts generate by the source. For example, other PC.

In the same way, the wireless networks free you from the bondage of a cable Ethernet in a desk. The users or developers could work in the library, in a conference room, in the parking, or even do in the front cafeteria. While the users of wireless network that are inside the frames, could take advantage of the network.

The available equipment could include a corporative campus and in favorable terrain, could amply the scope of a network that rule under the standard 802.11 as far as 6 kilometers using repeaters, access points or some architecture that allow the application of our signal.

Wi-Fi

It is possible to obtain a complete list of the equipment that have Wi-Fi certification in Alliance-Certified Products. Only to know the brands which are compatible with Wi-Fi. Although was thought that the term came of Wireless Fidelity as equivalent to Wi-Fi, High Fidelity, which is use in the recording of sound, really the WECA contract an advertising company in order to get a name for its standard, in such form that it will be easy to identify and remember.

One of the most serious problems of which nowadays the Wi-Fi technology confront is the progressive saturation of the radio-electric spectrum, caused by the users manifestation, this specially affect in the connection of long distance (bigger than 100 miters). In the reality the Wi-Fi is designed to connect computers to the network to reduce distances, any use of bigger scope is exposed to an excessive risk of interferences.

How would be the interference?

One of the most frequently causes is because exist closer wireless networks that are occupying the same channel that ours. The cellphones are also cause of interferences and that in some moment could cause that the information could not be read in a correct form.

"The interferences generate as much as connection problems as velocity ones and limit the scope of the wireless networks, for which, constitute an inconvenient gene for the correct operation and with an adequate performance of the network. In the other hand, if the interferences are malicious, we will be also in front if security problems."[6]

The interferences are not the only thing about we should be worried in the moment to manipulate the computing equipment of the English laboratory and/or the other portable equipment, it should take in consideration another type of preoccupation such as:

Dust. The dust is one of the worst enemies of the electronic devices of the wireless networks and the PC, because the accumulation of the same could impede the correct operation of the fan of the power sources of the processors.

Liquids and moisture. The shed of liquids into of the networks devices that are not prepared to fight with climatic factors could get to be catastrophic. Avoid the drikns near any device of wireless device.

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[6] C. HILLAR GASTON. *Redes inalámbricas Wi Fi Diseño, Instalación y Configuración.* Ed. HASA, Buenos Aires 2008, p.45

Smoke and ash. Many wireless networks devices that are not prepared for the use in exteriors, in other words, they are not for be outdoors. It does not like the people who smoke near it. The problems generate by the ashes and the smoke are similar or worst that those that could produce the dust. It is common find with routers or access points that present failures in the environment where there are smokers.

A high percentage of networks are installed without having in consideration the security converting like that their networks in open (or completely vulnerable for the crackers), without protect the information which through them circulate.

The devices of the reception cover three majority types:

- PCI cards
- PCMCIA Cards
- Wireless USB adaptors
- The PCI cards for Wi-Fi are aggregates to the computers of desk. Nowadays are losing terrene because the USB cards.
- The PCMCIA cards are a model that was use a lot in the first portable computers, although are falling in disuse, because the integration of intern wireless cards in these computers. The biggest part of these cards is only capable to achieve the technology B of Wi-Fi. No allowing, therefore, enjoy a high transmission velocity.

- Wireless USB adaptors. Inside this little frame we find a card of Wireless network so capable and potent as the best PCI or PCMCIA. It has a maximum velocity of 54mbits that only could achieve if we use in an USB interphase. Its integrated antenna have a maximum scope of 120 mts average without obstacles and it is compatible with the principal security standards and of establishment of networks as much as through infrastructure points (access points) as for point to point networks (AdHoc)7.

It is compatible with 802.11g protocols therefore with its last version the 802.11b so we can use it in networks of 54Mbits and also in older networks of 11Mbits without any kind of problem. It also accepts "roaming" with which the mashing connects to the closer access point in automatic form improving the reception in networks with different repeaters or bridge. 8.

[7] Red AdHoc. It is the simplest mode for the network assembling. This mode is recommendable only in case that is necessary a communication between no more than two devices. http://es.wikipedia.org/wiki/Ad_hoc

[88] Bridge. Element that allow to approach networks of same nature, and which function is managed the messages traffic between both. Networks of facts and IP convergence. Alfaomega Grupo Editor.

Factors to have on account

"The cards of wireless network function in a similar form that other devices connected to a bus[9] of expansion or to a bus of E/When the equipment have to send facts in the network, or get of expansion bus or bus of E/S and is in charge of transform them in signals of radiofrequency adequate to transmit the information in a wireless form. In the other hand is in charge to receive the correspondent facts to the equipment to which are connected through the capitation of radiofrequency signals and transform it in information that could be transmitted by the bus directly to the processor memory." [10]

The USB cards for Wi-Fi are the most common type of card that exist and simplest to connect to a PC, being of desk or portable, doing use of all the advantages that the USB technology has. Also, some of them offer the possibility to use the named PreN technology, which is not standardized yet.[11]

Infrastructure mode

In the infrastructure mode, each informatic station (abbreviate EST) connect to an access point through a wireless link [12] . The configuration formed by the Access point and the stations[13] Placed inside the coverture area is called group of basic service or BSS. This forms a cell. Each BSS[14] Is defined through a BSSID [15] (identifier of BSS) which is an identifier of 6 bytes (48 bits), in the mode infrastructure the BSSID correspond to the Access point of the MAC direction.

It is possible to link many access points together (or more exactly many BSS) with a connection called distribution system (or SD) in order to form a group of extended service or ESS[16]. The distribution system could also be a connected network, a cable between two access points or even do a wireless network.

An ESS is identified through an ESSID (identifier of the group of extended services), which is an identifier of 32 characters in ASCII format.

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[9] Is a digital system that transfers facts between the components of a computer or between computers. It is formed by cables or tracks in a printed circuit, devices as resistance and capacitors and also close circuits.

[10] IDEM. p. 53

[11] Reference: http://es.wikipedia.org/wiki/Wi-Fi. It is said of the PreN technology, will be the successor of the norm 820.11g and n respectively, and is said that will achieve bigger velocities and more distances that could offer these standards and some access points.

[12] We will remember that the transmission media is the air and the nodes are on a site and the access point in the other, each terminal which count with a device that allow creating the wireless link (USB Wireless, Wireless network card, etc).

[13] They are computers, Laps or minilaps that are inside the coverture area; In our particular case, from the A1 machine until h5.

[14] Basic service set

[15] Basic service set Identifier

[16] Extended Service Set

Points of wireless Access

A point of wireless Access i a device in charge of establish and coordinate the wireless communications in a coverture area determinate by its scope Rank.

Its function is similar to the one that accomplish a hub in a cabled network with a start technology, but without using the cables. In many places, simply, the Priodigy could be used in a wireless form and this is a wireless connection. The wireless internet that we have in the CECyT (the already know Ecatepec is of al) in the same form is a wireless connection. There are many cities that count with wireless areas, in this case use antennas that allow the existent of signal and generally its finality is the use of internet. The cellphones also count with Wi-Fi technology, simply add the name of user and password or according to the modem configuration that the service offers and then is possible to get connection to internet.

Figure 1

If it refers a laboratory such as, well I need to investigate in depth but there are many of offices that use Wi-Fi as alternative taking on account its costs of installation and accessibility.

However the majority still using networks with cabling. [17]

Application of the wireless networks

- Connection between cellphones and free hands equipment.
- Wireless network is small places.
- Communicate without cables the pc and entry and out devices.
- Transference of files between devices through OBEX.
- Transference of contacts files, quotes and reminders between devices through OBEX.
- Remote controls like that use for the Wi console create by the Nintendo company.

The Bluetooth wireless technology is a shot scope of the communications of technology destines to replace the cables of portable connection and/or fixed devices, maintaining high levels of security. The key characteristics of the Bluetooth technology are the sturdiness of low potency and low cost.

The Bluetooth specification set up a uniform organization for a big range of devices to connect and communicate between them. It is denominate Bluetooth to the protocol of communication specially designed for devices of low consume, with a los coverture base in transceivers of low cost. These devices are classified as "Type 1", "Type 2" or –"Type 3" in reference to their transmission potency, being totally compatible the devices of a type with the other ones.

17

http://www.monografias.com/trabajos43/bluetooth/blueto oth2.shtml

Type	Maximum potency allowed (Mw)	Maximum potency allowed (dBm)[18]	Rank (approximate)
Type 1	100 Mw	20 dBm	~100 miters
Type 2	2.5 Mw	4 dBm	~25 miters
Type 3	1 Mw	0 dBm	~1 miter

Chart 2

In the majority of the cases, the effective coverture of a device type 2 extent when is connected to a transceiver of type 1. This is thanks to the sensibility and potency of transmission of the device type 1, in other words, the biggest transmission potency of the device type 1 allows that the signal get with enough energy to the type 2.

In the other hand the biggest sensibility of the type 1 device allows to receive the signal of the other despite it is weaker. The hardware which is part of the Bluetooth device is composed by two parts:

- A radio device, in charge of modulates and transmits the signal.

- A digital control, composed by a CPU, for a digital signal processor (DSP) called Link controller and the interphases with the host device.

The IC or Link controller is in charge to do the prosecution of the base band and the management of ARQ and FEC protocols and of fixed cape.
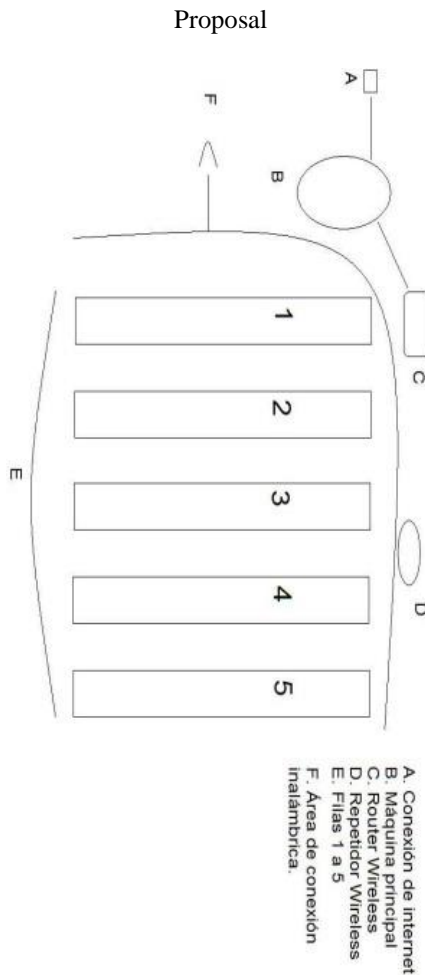
Also, is in charge of the transference functions (as much as asynchronous as synchronous), audio codification and facts encryption. The CPU of the device is in charge of attending the instructions related with Bluetooth of the host device, in order to simplify its operation. For that, over the CPU runs a software denominate Link Manager which has the function to communicate with other devices through the LMP protocol.

Probable risks in the adaptation of the wireless networks

The only risk is that the network does not work at all, given the actual state of the equipment talking specifically about the hardware. It had never have maintenance.

About the software (I want to suppose that the school, specially the informatics area will do the installation of the operative system in all the computers and I do emphasis in the computers that do not work at the 100%) from Windows xp the software is totally compatible with the wireless devices. It is possible that the velocity of signal reception no to be the ideal because each Pc will be connected to a Wireless USB (we had to opt for the Wireless USB because the budget).

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[18] Decibels ratio to one miliwatt

Chapter II

Location of the computing equipment of the English laboratory no. 2

Proposal

A. Conexión de internet
B. Máquina principal
C. Router Wireless
D. Repetidor Wireless
E. Filas 1 a 5
F. Área de conexión inalámbrica.

Figure 2

Installation process of the wireless network

The general idea of how to make the installation is apparently really simple, nevertheless, the configuration problems that could present between a computer and other.

Basically the connection to made with the cabling will be between A, B and C, in other words, the principal computer which shall exercise its function as server (In informatics, a server is a computer that, being part of a network, provides with services to the other computer, denominate clients) and this at is time will be connected to the router, that in the particular case will be who distribute the signal for the five computers or clients rows (which name is the correct in informatics terms). The figure D, is a repeater, like in the current topology (structure of the network that we have connect in the lab 2), that we have 3 repeaters and which function is, linked to its name, repeat the signal and that this do not lose its intensity. In the case of this research could or not be necessary to have a repeater, because the area is not that big, however, to be sure that we will have a good quality of signal, is recommendable. Talking of the devices that will need the computers in order to be adequacy configure, taking on account that these will receive an actualization or maintenance about Hardware and Software (It was a suggestion to install Windows XP because is friendly with the system and does not show many errors in the practice) the only thing that I need to install as additional Hardware was Wireless Network card. There are USB devices that have the same operation that the Wireless network cards.

The difference is in the fact that the cards are installed and the USB are external, therefore more susceptible to be damage.

Tow devices were quoted which operation is similar but not the same, these are: Wireless Router and AC Wireless (Access Pint).

Access Point: is a device that connects wireless clients to a cabling network. It has a RJ-45 connector (like the blue cable that the computers have or like the gray cable with which we connect to internet) in which connect the "cabling network" and the clients (laptops, pdas, pc's, etc.) they connect to the network through the access point.

Wireless router is a device that came out of the mixture of an Access point and a Switch Ethernet. (It has 4 normally) RJ-45 connector for the "LAN", 1 RJ-45 connector for the "Internet link" or Wan network (Wide Network area, the WAN networks could use communication system through satellite or radio) and the radio equipment (including antenna(s)) for the connection of wireless clients.

For these proposed scheme, was necessary a wireless router because what we want to do was create a new network and adapt to an existent one (although is not bad idea but could show some deficiencies given the condition of the installed network).

Practice

Definitely the experiences that the former practices have left to us have been very enriching, we have found that the Protect program does not limit at all the installation of our wireless network but the factors were limiting us to achieve a successful connection it was according to the scheme of the figure: S

Scheme 1 Wireless, Were installed the following devices.

-   Wireless N 150 Home Router DIR-600
    MAC Address: 1CAFF797FF70

-   Wireless G Access Point DAP-1150
    MAC Address: 1CAFF7EC0634

-   Wireless G Access Point DAP-1150
    MAC Address: 1CAFF7EC069E

Figure 3

Scheme 1
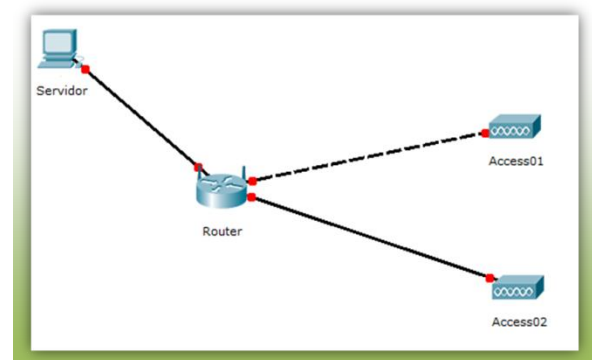
1. We turn named compute on according to the Scheme as "Server" and open Internet Explorer in order to configure the LAN connection of the Router.

2. In the address bar of Internet Explorer we type the following address: 192.168.0.1, which is the IP of the Router.

3. Open the login page. In user we type "admin" and as password we only pressed ENTER.

4. We locate in the right panel the option LanSetup and once inside of the platform we disable the DHCP Server option clicking over the icon that appear nest to the same.

   If we do not disable this option in the moment to connect to our router the two Access points we will have 3 signals.

5. We logout. Now the router will only route to the signal of access 1 and the access 2. Now we proceed to configure the two access points.

Access Point 1

In the address bar we type: http://Dlinkap and give enter. It opens the platform in where first we will type in user: admin and in:

1. Password: only pressed enter. In the left Panel we placed the Setup Wizard option and click there.
2. Posteriorly once inside the window of this option, click in Lunch Setup Wizard.
3. In Device Name (NetBios Name) we type the name with which we will identify and know that name does the access point we are configuring has. In this case we wil put: Access1. Click in Next.
4. It asks us to create a password to login in this Access Point, type: access01. Click in next.
5. It asks us to select a method with which we will continuous configuring the device. We select Manual click in next.

6. In Network name or SSID (Service Set Identifier) we type: Ingleslab1 and then click in the option: Manually assign a network key. Click in next.
7. As Network Key type: access01. Click in next.
8. It shows the captured information and finally we click in SAVE.
9. After that we come back to the initio window, placed the LAN Setup option in left panel. In the separated of LAN CONNECTION TYPE there is an option which says: My LAN connection is: We select Static IP.
10. In STATIC IP ADDRESS LAN CONNECTION TYPE we will ingress the follow information:
11. IP Address: 192.168.0.3 Subnet Mask: 255.255.255.0
12. Gateway address: 192.168.0.1 (which is the IP address of our router that is the address of routing that will take as reference to obtain the signal.
13. In Device Name should appear the one we assigned in the process of configuration.
14. Finally click in Apply Settings.

Figure 4

In base to the following diagram we will made the configuration of the topology.
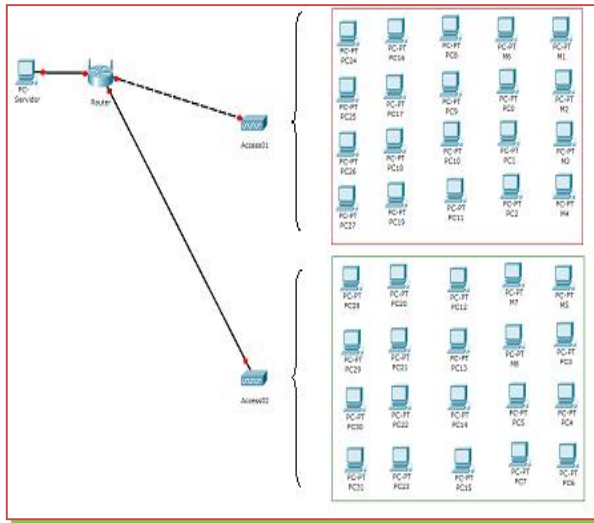

Figure 5

In order to allow the Access only to the computers of the cell 1 which will has Access to the network: Ingleslab1 we have to discharge the MAC addresses of each USB WIRELESS as much for those that will have the access to the network as those that will be restricted from the same. The same will happen with the MAC addresses of the USB WIRELESS that will use the Ingleslab1 network.

he principal advantage of this structure that we are using is that there will not be saturation in the signal because each point access will have defined its coverture area avoiding with this the weak signal. To configure each access point we follow the following steps:

This is the structure that our wireless network will have. The principal computer call for this practice as "Server" will be the one that share all the information that will be manage in tye networks. This does not limit that the users could no share files.

To our server will be connect the Router which will be the one that guide the signal to the access point.

We will have two access points connected to the Router.

Each one call as Access 1 and Access 2 respectively giving signal each one to each cell, market in the scheme as Cell 1 and Cell 2.

- Inside the interphase of access point configuration (1 or 2) places the option ADVANTACED in the principal menu and in the left panel the option Access control.
- EFor default appears to us in the window of drop down menu of the control access option; this is, any computer that wants to connect to our network (Ingleslab1 for example) could do it even if does not make part of the laboratory.
- For example a Lap that counts with card of wireless network and find the signal could joy to our network. We have to consider that this foreign computer to our network at least it know the password, will cannot connect; in other way will be almost impossible to do it.
- In MAC address we insert the MAC address of our USB WIRELESS; after we click in CCLONE and the in Apply Settings (what this last option do is actualize the typed information).
- We repeat the same operation for the entire MAC that will have access to our Ingleslab1 network, and to disable the MAC that will not have access in the Control Access option we select reject.
- We logout clicking in logout in the left panel and then click in logout with which send us to the scree "login".

Computer physically tagged as:	Name of the equipment in the network	I.P	MAC address	Status
D4	A1	192.168.0.5	F07D6811F01C	Accept
A3	B1	192.168.0.6	F07D6811F97E	Accept
D2	D1	192.168.0.8	F07D6811F313	Accept
E4	E1	192.168.0.9	F07D6811F046	Reject
H4	F1	192.168.0.10	F07D6811FEC8	Reject
B4	Ipn-020*7248f49*	192.168.0.12	F07D6811FEEB	Accept
124/04 (Ref. # Serie)	lcb*	192.168.0.13	F07D6811f26c	Reject
A1	cecyt3-443fd5a2*	192.168.0.14	F07D6811F30B	Accept
H1	cecyt3-443fd5a2a*	192.168.0.15	F07D6811F0C1	Reject
H3	Lcb1	192.168.0.16	F07D6811EFF1	Reject

Cell 1

Chart 1

Graphic 6

Computer physically enrich as:	Name of the equipment in the network	I.P	MAC address	Status
D4	A1	192.168.0.5	F07D6811F01C	Reject
A3	B1	192.168.0.6	F07D6811F97E	Reject
D3	C1	192.168.0.7	F07D6811EE60	Reject
D2	D1	192.168.0.8	F07D6811F313	Reject
E4	E1	192.168.0.9	F07D6811F046	Accept
H4	F1	192.168.0.10	F07D6811FEC8	Accept
A4	1alal*	192.168.0.11	F07D6811EE13	Reject
B4	Ipn-020*7248f49*	192.168.0.12	F07D6811FEEB	Reject
124/04 (Ref. # Serie)	lcb*	192.168.0.13	F07D6811f26c	Accept

Cell 2

Chart 2

In this window we could give discharge the MAC address of our USB WIRELESS which will have access to Ingleslab1 and Ingleslab2, as well as those that form part of them respectively. As we go capturing the Mac address of each USB WIRELESS we should click in Clone and then in Apply Settings. We will have to repeat this operation as much MAC we want to add. This operation we will implement in the two access points remembering that in each one of them we have to add the MAC that we will accept or reject in each access. Then it shows the accepted and rejected MSC address for each cell with the finality to see the comparison and understand better the mentioned structure.

Once done that, we try connecting from each computer used in this practice to the contrarious cell to which belong, for example, we consider the follow cases:

The computer D4 with equipment name A1 belongs to the cell 1; the network to which have to connect is Ingleslab1, we try to connect to the cell 2 which connection network is Ingleslab2. We ingress the password of the network that for Ingleslab2 is access02. It sends us a message saying: "It is not possible to connect to the asked network". With which we prove that the computer in the moment to try to connect, the access point 2 detect that the MAC address of the USB WIRELESS device is register as reject.

The computer D3 with equipment name C1 belongs to the cell 2; the network to which have to be connected is Inleslab2, we try to connect to the cell 1 which connection network is Ingleslab1. We ingress the password of the network that for Ingleslab1 is access01. It sends us a message saying:

"It is not possible to connect to the asked network. With which we prove that the computer in the moment to try to connect, the access point 1 detect that MAC address of the USB WIRELESS device is register as reject.

After that, we start to use the information of the shared files of the server. The types of information which with we interact were videos, audio, images, documents. We consider of importance the correct visualization and reception of the videos' audio and the sound files. We maintain in the different computers for almost 1 hour and a half and watching different videos and there were any problem with the reception and visualization.

Only in the computer A4 (does not belong to the one that was assigned for the practices) it was disconnect once. We restart the computers belong to the laboratory and at charging the operative system we realize that the software of the USB WIRELESS was erased. The computer assigned for the project work in a correct form.

Conclusions

In the beginning of the research, in our first practices were presented many problems to begin to transmit information through the wireless network between those problems highlight:

The equipment could not login to the wireless network.

The equipment of the applications crashed when the functions of the wireless network were use.

The performance of the facts transferences through the network was well below of the expected according to the desire technologies.

Every time we transmitted information through the network, the general performance of the equipment reduce caused by a core of the prosecution represented a charge of work of the 100%.[19]

It is important to point that when the students and teachers do not count with the experience un the use of the wireless networks many are the hypothesis that come out after the first practice, however, now, we could classify that the last 2 implemented practices sample equipment has result successful in the transmission of information through Wi-Fi, which provide us elements of pertinent judges to ensure that the results that were expected in the moment to make the last practices in the which we will be managing the totality of our universe, will be of successful character, of course, that some variables could present like the transmission velocity that is desire to share, however, we consider that we will achieve successfully the general objective of the project. The complete process of the wireless network installation generates the application of different technologic tools that will allow being use definitely for the implementation of other projects.

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[19] C. HILLAR GASTON. *Redes inalámbricas Wi Fi Diseño, Instalación y Configuración.* Ed. HASA, Buenos Aires 2008, p.73