Term Paper

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# **Introduction**

Since each of the communication network and every type of communication is expected to deliver the best possible results in terms of delivering increasing data rates, the existing efficiency of the communication needs to be improved. Improvement of efficiency is necessary and crucially essential because there are several problems and issues to be seen in communication especially in wireless communication. It is a reality that coin has two sides, so based on this reality it can be stated that wireless communication is considered as the most effective and highly efficient type of communication but it does have some critical issues as well. The issues which can be witnessed in wireless communication are mostly associated with the security and systems (complexity of the systems and their application). While the speed and accuracy of wireless communication in comparison to wired communication can be reflected as its credibleness.

Proceeding further, analyzing the current status and future of any topic under discussion is a good step taken by writers all of the time. Hence analyzing the future of wireless communication or giving a view to the future of wireless communication is essential to make a part of the paper. Hence, the second phase of the paper elaborates on the future of wireless communication and lists the reasons that why and how the concept of wireless communication looks upbeat and glow in the future in comparison to the present.

# **Wireless Communication**

Wireless Communication is a type of data communication which is done and performed without direct wire communication. In other words, wireless communication is communication that is performed wirelessly. The term wireless communication is a very broad term that includes lots of processes, procedures, and forms of connecting and communicating between two or more devices that use wireless signals through the technologies of wireless communication devices. Wireless communication is usually seen in daily life on a small level such as communication among individuals through the use of cell phones and the internet etc. but it is a very broad field where a very critical and huge amount of data and information are communicated (Deck, et.al, 2018). Such huge and critical data and information are shared and communicated among companies, businesses, agencies and other large level bodies.

Wireless Communication mainly works by the electromagnetic signals which have broadcasted by an enabled device or devices in the air, atmosphere, or the physical environment. The communication in wireless communication is done and completed at the time when the distance or the intermediate device captures the signals where the device creates wireless communication then and works as a bridge between the sender and receiver device. This type of communication has several forms, delivery methods or techniques, and technology that includes;

* Mobile Communication
* Satellite Communication
* Infrared Communication
* Wireless Network Communication
* Bluetooth Communication

Hence, each of these communication technologies and techniques has varying underlying architecture. In short, all of these technologies lack a wired and/or physical connection between all of the respective devices to develop and execute the communication.

# **Issues regarding Wireless Communication**

It is a fact that wireless communication is one of the most credible inventions of the current time. It is considered an outstanding contribution to the communication and networking of the present time. But on the other and opposing die, it cannot be ignored as well that gaps and problems exist everywhere. Hence, the same can be found with wireless communication (Deck, et.al, 2018). There are several issues to be witnessed with wireless communication. Some of those issues are considered as most crucial and critical while some of them can be considered minor issues. In short, the issues in wireless communication can be categorized as major and minor issues where major issues are more critical and need a lot of efforts to control and eliminate even in any possible way, but minor issues are the ones that create problems but do not need so huge efforts to eliminate and cover. So, some of the main issues in wireless communication and their possible discussion and analysis are done in this part of the paper.

According to (Ijemaru, et.al, 2018), the main and most critical issues in wireless communication are security issues. Security issues are considered as the main and even the most critical because security in communication is the most important thing to ensure. While on the other side, it is everyone’s concern to have fully secure communication no matter they use wire communication or wireless. So, some of the important security issues in wireless communication and the brief explanation of each is as follows.

## **Eavesdropping to Intercept the Data**

It is an act of illegitimately receiving and intercepting information which is communicated through the sources of wireless communications and networks or channels that can possibly result in the affected data or information being compromised. This happens so because the airwave is not fully secure while an attacker can have access to hijack the signals over the air from a specified location and distance.

## **Electromagnetic Interface**

The terms interface is found very common and usually happening in the broadcasting where a radio receiver might may ick more than one or single channel at one time during the broadcast. Hence, this concern often leads to a signal to fade and then leads to disruption of the normal and smooth transmission.

## **Bandwidth Congestion**

Piggybacking is the ultimate reason due to which the security issue of bandwidth congestion happens. This (Piggybacking) is the unauthorized access of wireless LAN. This includes the process and practices of accessing a wireless internet connection by any other user who uses the wireless internet service of any other subscriber without having the permission of the person (Ijemaru, et.al, 2018). Piggybacking also causes direct attacks on your computer system and services violation as well as other illegal activities by the use of malicious users which could be traced towards you.

## **Wireless Network Sniffing**

Wireless network sniffing is considered as one of the most critical issues in wireless in terms of elimination or control. A wireless sniffer is a tool or piece of software or hardware which is designed to intercept data and information at the when it is transmitting on the wireless network and then decode that data or information into a new or another format which is easily readable and understandable for humans. These wireless sniffers are even specifically designed for the purpose to catch in or capture the data or even information when it is transmitting over a wireless network. One the other side, wireless packet sniffers are the piece that is used to keep wireless networks maintained while their capabilities also make them effective and popular tools available for controlling malicious attackers and attackers. These tools are used by hackers to stool out data and information at the time when data is under transmission over a wireless network. Through the use of these sniffing tools, a lot of important information such as account details, bank details and information, passwords, emails, logins, and credit cards' details, etc. are stolen by the hackers.

For securing such crucial and highly noticeable issues, there are a number of tools available such as SFTP, HTTPS, and SSH, etc. Each of these protocols makes sure that any information transmitted is automatically encrypted.

## **Denial of Service Attacks**

Denial of Service Attacks is one of the major security issues in wireless communication. It is a situation in which a user of wireless is illegitimately deprived of the service of the resources of the network by malicious attackers. In this process, they (attackers) flood the entire network and communication through the unnecessary messages to make the complete network unavailable for the purpose to record each and every code (Ijemaru, et.al, 2018). In this, the codes are recorded with different cracking devices at the time when the network is under-recovery. Hence through breaking the security allows the attacker to get access to the data and/or information he/she or they look for.

## **Wireless Spoofing Attacks**

In this security issue, the spoofing is a type of attack is used. In this type of attack, the attacker(s) uses the collected or gained data and information for impersonating other devices or devices in a particular network. Business networks are mostly attacked with these attacks and used to capture important data and information of the business from their networks. Firewalls and their use are the way which can be used to mitigate such attacks on businesses’ network or other networks. The use of firewalls capable of deep packet inspection or taking measures for the verification of the identity of the sender and receiver of the message are the best possible ways to cater and control this issue of wireless communication or networking (Ijemaru, et.al, 2018).

## **Traffic Redirection**

Traffic redirection is an issue that involves variances in the traffic route of a computer to that of an attacker or hacker through the manipulation of the MAC (Media Access Control) address as well as the IP address of any specific wired station.

## **Rogue Access Point**

In wireless communication, it is a wireless access point which are installed by the hacker or attacker on other network which are secured without having the authorization from the administrator of a local network (most of the times in the public and shared places like airports etc.) where the traffic has been accepted from the unsuspecting wireless clients for the purpose of getting or extract important and sensitive information.

## **Cafe Latte Attack**

Cafe latte attack is a wireless communication problem in which the attack enables the hackers or attackers to break out intruder into the key of WEP. This is done by the process of sending a flood of encrypted ARP requests. The WEP is captured and obtained within minutes once the packet of clients has been got into access (Ijemaru, et.al, 2018). The ARP is used in this process which means that controlling the ARP can be considered as a part of the solution to this major issue or problem.

## **Congestion Problem/Issue**

This issue occurs and can be seen in the case when the free RAC (Random Access Channel) becomes inaccessible to the subscribers while making a call or responding to call at any time. When the AFC cannot get free Traffic Channel, then it leads to the occurrence of TCC. This happens or occurs when the AGC cannot get free TCH to allocate to the concern or request of the mobile terminal by the RAC (Random Access Channel).

## **Network Injection Attacks**

Network injection attack is a type of issue/problem in wireless communication or networking the access points are used by the cracker or attacker to insert the possible fake network re-configuration keys and commands. This process of using access points is used to bring in or bring down the entire network or networking process while it needs the process of rebooting and/or reprogramming of the entire networking process and devices so that the fake codes, keys, and/or commands can be inserted or injected.

## **Man-in-the-Middle Attack Problem**

Man-in-the-middle attack in a wireless communication issue/problem which is a type of eavesdropping attack. In this, the attackers or hackers of the data and information develop a conversation between two parties in a fake manner. In this process, the attackers imitate both of the involved parties and get access to the data and information of search while the involved parties rely on each other at the result (Ijemaru, et.al, 2018). Security faults in the handshake are the way in which the man in middle attacks mostly relies on where the de-authentication attack is executed.

Despite the above-listed issues in wireless communication which are mostly large-scale issues, there are several issues in wireless communication in home networks. Briefly, mainly there are three key issues regarding the home network of wireless communication. Those issues are; 1) support for a wide variety of wireless communication, 2) prevention of interface and improvement of actual throughout, and 3) simplification of certification and setting process. While the possible explanation of each one is below.

## **Support for Wide Variety of Wireless Communication**

Every standard of wireless or wireless communication is optimized for a particular purpose. Each of these standards has been changed for the purpose to improve performance through the implementation of new technologies. However, this has increased the implementation or application area of wireless systems while there are still a number of wireless standards while it is much difficult for users to choose out the most perfect and highly relevant wireless system. So, this issue needs users to develop a wireless home network platform that supports different standards.

## **Prevention of Interface and Improvement of Actual Throughout**

The wireless system and communication devices use bands of unlicensed frequency where several wireless systems may exist. However, the proliferation of wireless communication and system has led to an increased possibility of coexistence which further increases the amount of interference in a similar system or one system or different systems (Ijemaru, et.al, 2018). So at the result, it is not enough to cater to the predicted increase in the communication traffic of wireless communication while improving spectral efficiency would be required and important to keep high systems maintained throughput the wireless systems.

## **Simplification of Certification and Setting Process**

The amount of wireless communication devices increases as people increase the connection and use of wireless communication throughout their activities. While the setting of such increasing systems becomes difficult for the users to differentiate them based on or according to the wireless device or entire wireless system. So, it leads to a critical issue in wireless communication while this needs a mechanism that does not need the user to implement any system as per the wireless process. It does require and necessary because the certification process and complete procedure will need to be applied and followed in the application of the process to simplify the setting and system.

Finally, it can be stated that when the above issues of wireless communication are catered and resolved, then the data or information can be kept secured, attackers and attacking or hacking can be prevented and controlled, security could be ensured, and users of wireless communication increase the use of wireless communication and they would be able to adapt wireless communication system more than they currently do. So, the adaptation of wireless communication and its systems, as well as more usage of wireless communication, would lead to a better and more lightened future of wireless communication (Ijemaru, et.al, 2018). So, proceeding further, it can be said that no doubt that there are many issues to see in wireless communication but its future has been predicted as credible. For the purpose to analyze the future of wireless communication, the paper put a light on some aspects of the future of wireless communication in the next (coming) phase.

# **The Future of Wireless Communication**

In the present time, Wireless Communication is gaining all of the attention. It gains the attention of everybody including individuals and communication. Wireless communication even completely changed the way of communication and made communication more than easier for people, organization and other bodies. This did so not by putting huge costs and additional or extra expenditures on the bodies which adapted and started the use of wireless communication while it decreases huge amounts of costs and communication expenses for individuals and organization in several ways. Beyond that, wireless communication also simplified communication as compared to the past while not left it difficult as it was in the past. Wireless communication is used in more few areas and things while (as explained above) it is done through the use of many wireless communication devices. The technology and wireless communication and its progress go in hand to hand with each other. It is also a fact in the current time and it would be important in the future that businesses, organization, and industries or projects needs effective and efficient processes of wireless communication to grow and get succeed. Despite, individuals are also working to get switched from wired communication and use of wired communication devices to wireless communication and the use of wireless communication devices. People do so because of wireless communication and the way it works helps them to reach people whenever they are in such needs. The use of wired communication is much expensive as compared to wireless communication. As discussed earlier, the wireless communication is costly benefited instead of expensive because it cuts the cost of all wired setup which is comparatively very high.

From past years the technology of wireless communication has hugely impacted the telecommunication as well while it is considered as one of the most positive impacts of wireless communication and the technology it uses. According (Mueck, et.al, 2019), wireless communication has become the first and even the primary choice of every organization, business, industry, agency, and even every individual. This has become such a choice because of the incredible benefits it provides such as speed, the accuracy of communication, access to data and information, and security (beyond the issues it has), etc. For companies, businesses and/or organizations wireless communication has become and becoming essential to reach out to each of their customers as well as other associated bodies like suppliers, competing businesses or companies, and the entire industry of their business operation. Similarly, it has several benefits for other agencies like a gathering of data and information reaching out to the target goals like achieving the desired advancement in their operations, for instance, ensuring advancement in medical science and hospital operation. In short, no doubt exists that wireless communication and its technology have changed the means of communication while it does not the meaning of stop while it is found expanded all the time and the same would be the case in the future. Hence wireless communication would be a part of every, but not limited to business, organization, industry, projects, hospital, communication, management, and networking, etc. Wireless communication is considered as magic in the current time while it may take a more enchanted name in the future because of the predicted role it would lay. Hence the future of wireless communication can be explained through analyzing its role in different sectors and areas.

## **Wireless Communication in Business and Company**

It is the fact and reality that every business and Company (except the nonprofit organizations) works to make more revenues and put every possible effort in place to generate hugest possible amounts of profits from the sources they utilize. While wireless communication is the source that helps in doing so and achieving the goal more than we or businesses and companies think about. It is helpful and significantly important because no matter the business or company is of small scale or large, but communication is mandatory. On the other and similar side, every business needs to adapt communication and its technologies with not thinking about the cost it needs. But on the other side, the opportunity of adapting wireless communication which is effective, efficient, superior to wired communication, and beneficial in terms of cost. Beyond that, every business and company know that wireless communication is the source that allows them to reach every important body such as customers. So, because of these concerns, wireless communication is and would be the first priority of businesses and/or companies in the future.

## **Wireless Communication in Networking**

Mobile is one of the greatest contributions of wireless technology which enables an easier wireless communication among people and organizational bodies. Mobile devices are found the most rapidly changing and improving an aspect of wireless communication. This (mobiles) also brings in a number of additional resources that could be used for communicating wirelessly. Hence the innovation, modernization, and revolution of mobile devices clearly state that the future would be covered even entirely by wireless communication. Everybody including individuals, organizations, bodies, and/or agency prefer to have everything such as interconnection, intelligence, information, and data, etc. in their range while wireless communication is the source that makes this possible for them in the present and will be doing so in future. Beyond that, the future of wireless communication in this aspect can be seen very affecting because it makes offerings of a number of new prospects in services like competence.

## **Wireless Communication in Medical Science**

In medical science, the future and success are dependent on wireless communication. As the field of medical science has huge communication issues to face like the communication between hospitals and healthcare professionals cannot be seen strong. Beyond that, there is a number of reporting and other issues which can be witnessed inside hospital and departments. Hence it another fact that most of these issues occur due to poor communication while the communication can be considered poor because the wired communication in a number of the hospitals can be seen which does not ensure efficient communication so. While on the other side, wireless communication is the source and way the serve as a solver of bigger troubles, problems, and complications. Wireless communication can also be found helpful as it is adapted and still adapting by medical bodies for the purpose of remote monitoring of hospital operations, remote monitoring of the patient, ensuring access to patients’ information such as biodata and background information, etc. at the time when needed. So according to (Mueck, et.al, 2019), the medical field is most likely to be covered and improved if the application of wireless communication has been made sure. This means that it is expected that wireless communication would come to see in the future in the field of science.

## **Future Advancement in Wireless Communication**

Despite the above, based on the argument presented by (Deck, et.al, 2018), the future of wireless communication is terahertz. A number of scientists investigated that the future of wireless communication would be shaped as terahertz. This simply means that the wireless communication would be changing even the pattern of communication in the coming future. They further state that wireless communication is the communication that will be changing the interaction of people and organizations etc. in communication. According to the statement proposed by (Deck, et.al, 2018), the transmission of data and information on wireless devices and resources will take a new method of processing in the nearest coming future. His findings further state that most of the receivers which may be an individual or an organizational body only know the information they receive while they do not even have the idea about the type of response they are getting with the data or information they receive. While in the future, with the help of terahertz in wireless communication, the receiver would be able to know and define the type of response they receive with data, information, or message while having a clear idea of system the data or information has been received from. This would include the systems from which people and organizational bodies sometimes receive information (especially through messages) but do not mostly know about the nature of the system. While through changing the relative orientation of the system and source, receivers would be known about the wireless system they receive information through and communicate through them wirelessly (this does not include common wireless communication systems and devices etc. while it involves only critical and high-level wireless communication systems which are mostly used by high-level agencies etc.). Beyond that, in the future, wireless communication would the sources that will open new doors of bringing innovation in the way communication is done through. In short, the future of wireless communication looks more and more glow and spark within the current passing days because there is no field where the use of wireless communication is not in use.

# **Conclusion**

After an in-depth analysis of the topic we have at hand “Wireless Communication: Issues and Future”, it has been concluded that the issues which can be found in wireless communication cannot be taken lightly. This cannot be done so because most of the issues of wireless communication are associated with security such as 1) Electromagnetic interface, 2) Wireless network sniffing, 3) Denial of Service Attacks, 4) Wireless spoofing attacks, and 5) Congestion Problem/Issue, etc. While every person and organization or business always to have ensured the security of their data and information. In other words, the issue in wireless communication is not much simple nor too shocking because the issues do not show that the entire system of wireless communication is in trouble while it has gaps in terms of security. So, covering the explained gaps can lead to a type of communication that would be fully perfect to use.

On the other side, the conclusion states that the future of wireless communication is much glow and compound than our thinking. As wireless communication is ensuring credible innovation while being so beneficial in many ways, the communication looks covered entirely by wireless communication in the coming future. It looks so because of the benefits of wireless communication to even every field and the way it becomes advancing and improved day by day.

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