Review Article
COMPARISONS OF WIRED AND WIRELESS NETWORKS: A REVIEW

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ABSTRACT
Previously, wired network has proven its potential but nowadays wireless communication has emerged as a robust and most intellect communication technique. Each of these types of networking has their advantages and disadvantages according to its network characteristics. Wired and wireless networking has different hardware requirements, ranges, mobility, reliability and benefits. The aim of the paper is to compare the Wired and Wireless networks on the basis of various parameters such as Reliability, Mobility, Speed, Security etc.
KEYWORDS: Cost, Reliability, Mobility, Speed, Security etc.

1. INTRODUCTION

1.1 Wired Networks: In computing terminology, the term "wired" is used to differentiate between wireless connections and those that involve cables. A wired setup uses physical cables to transfer data between different devices and computer systems. Most wired networks use Ethernet cables to transfer data between connected PCs. In a small wired network, a single router may be used to connect all the computers. Larger networks often involve multiple routers or switches that connect to each other. One of these devices typically connects to a cable modem, T1 line, or other type of Internet connection that provides Internet access to all devices connected to the network [2].

1.2 Wireless network: wireless network refers to the use of infrared or radio frequency signals to share information and resources between devices. Many types of wireless devices are available today; for example, mobile terminals, pocket size PCs, hand-held PCs, laptops, cellular phone, PDAs, wireless sensors, and satellite receivers, among others. The emerging third generation cellular networks have greatly improved data transmission speed, which enables a variety of higher speed mobile data services. Meanwhile, new standards for short range radio such as Bluetooth, 802.11, Hiperlan, and infrared transmission are helping to create a wide range of new applications for enterprise and home networking, enabling wireless broadband multimedia and data communication in the office and home. In Section 2 gives the comparison of wired and wireless networks on the basis of various parameters, section 3 gives the applications of both the networks and section 4 gives the conclusion. [1]

2 COMPARISONS OF WIRED AND WIRELESS NETWORKS

The Comparison of Wired and Wireless Networks given in a table no.1 [1, 2, 3, 5, 9, 10]

Sr. No.	Characteristics	Wired Networks	Wireless Networks
1.	Installation	Difficult to moderate (Because More no. of components are used during installation and require cables to be connected to each and every computer in the network	Easy installation (neat and clean, no untidy cables are used in this
2.	Visibility Node to Node on same network	All of the nodes on a wired network can hear all other nodes	Many nodes on a wireless network cannot hear all of the other wireless nodes on the same network
3.	Visibility Network to Network	Networks are invisible to other wired networks. The presence of one wired network has no effect on the performance of another wired network	Wireless networks are often visible to other wireless networks. One wireless network can affect the performance of other wireless networks.
4.	Time to installation	More (due to connection of each and every computer in the network)	Less (no untidy cable connections involves in this)
5.	Cost	Less (such Ethernet, cables, switches are not expensive)	More (wireless adapters and access points are quite expensive)
6.	User connectivity	Connectivity is possible only to or from those physical locations where the network cabling extends.	Connectivity is possible beyond the bounds of physical network cabling.
7.	Mobility	Limited (because it operates only on a connected computers linked with the network)	Outstanding (enable wireless user to connect to network and communicate with other users anytime, anywhere)
8.	Reliability	High (Ethernet cables, switches are reliable because manufactures have improving technology over several decades)	Reasonably high(because if the major section like router break down the whole network will be affected)
9.	Speed and Bandwidth	High Up to 100 mbps	Low Up to 54 mbps(depends upon standards 802.11g)
10.	Cables	Ethernet, copper and optical fibers	Works on radio waves and microwaves
11.	Hubs and switches	Need hubs and switches for connections	No need of hubs and switches
12.	Security	Good (by using some software like free wall software etc.)	Weak (because wireless communication signals travel through the air and can easily be intercepted but it can improve by encryption technique)
13.	Types	Local Area Network(LAN) Metropolitan Area network(MAN) Wide Area Network	1. By Network Formation and Architecture: • Infra structure based network • Infra structure less (ad hoc) network

			2. By communication coverage area • Wireless Local Area Network(WLAN) • Wireless metropolitan Area network(WMAN) • Wireless Wide Area Network(WWAN) • Wireless Personal Area Network(WPAN) 1. By Access Technology • GSM Network • TDMA Networks • CDMA Networks 2. Satellite Networks • Wi-Fi (802.11) Networks • Hyperlan2 Networks • Bluetooth Networks • Infrared Networks
14.	Standards	802.3	• 802.11a • 802.11b • 802.11g
15.	Signal Loss And Fading	Less(because in the wired connections interference will be less)	More (due to more interference, absorption, refraction and reflection etc.)
16.	Interference	Less (Networks are invisible to other wired networks. The presence of one wired network has no effect on the performance of another wired network)	Higher (the potential for radio interference due to weather, other wireless devices, or obstructions like walls)
17.	Connection Set up time	Less	More
18.	Quality of Service	Better	Poor (due to higher jitter, Delays and longer connection set up times)

3 APPLICATIONS OF WIRED AND WIRELESS NETWORK

The applications of wired and wireless networks are given below [1, 7, 8, 9]

3.1 Wired Networks:

3.1.1 Teleconferencing:

- It is the simplest wired application for voice communication by using PSTN.
- A telephone is used to conduct a conference between more than two people who are separated by a distance.

3.1.2 Videoconferencing:

- Two or more people can have a face-to-face meeting when they are geographically separated.
- Cameras, a computer, and videoconferencing software are used to conduct the conference.

3.2 Wireless Networks:

3.2.1 Enterprise Network: An enterprise network is an enterprise's communications backbone that helps connect computers and related devices across departments and workgroup networks, facilitating insight and data accessibility. An enterprise network reduces communication protocols, facilitating system and device interoperability, as well as improved internal and external enterprise data management.

3.2.2 Home Network or Home Area Network (HAN) is a type of local area network that develops from the need to facilitate communication and interoperability among digital devices present inside or within the close vicinity of a home.

3.2.3 Wireless Sensor Network (WSN*)* Wireless sensor network (WSN) refers to a group of spatially dispersed and dedicated sensors for monitoring and recording the physical conditions of the environment and organizing the collected data at a central location.

4 CONCLUSIONS

Wired and Wireless networks are very common in the workplace as well as in the home. The wired Computer Networks provide a secure and faster means of connectivity but the need of mobility i.e. anywhere, anytime and anyone access is tilting the network users towards wireless technology**.** Wireless technology has high mobility. Technology has been created to store, transmit and receive data through networks at very high rates of speed. Users can now store detailed information at a very low cost. In the future, the speed of networks will increase as they have in past years.   The cost of networks will continue to decline and using a network will be essential for every organization.   As computing technology increases in power, and decreases in size, the price of creating a high-powered full featured network will decrease rapidly.

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