Implementing Wireless Network in Computer Communication (A SURVEY)

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Abstract:

This paper presents actualizing remote system in PC correspondence In that the accompanying gadgets incorporates WI-FI, Bluetooth, WiMAX, mobiles Networks and most recent LI-FI innovation. This paper clears the thought of utilizing this remote system. A survey of what is expected to fabricate a nonspecific remote system is given. We can already know about the remote system and we can interface the PC by utilizing this remote system. The paper likewise progresses a portion of the significant security chances that remote systems face. Different procedures that can be utilized to moderate these dangers and protection the security and security of the system are given. A survey of how remote systems can be utilized as a part of instruction and preparing is then given and it is exhibited that the training field has profited from the development of remote innovation and the cost adequacy of this innovation.

INTRODUCTION

Whether this is on the grounds that you have made a call utilizing a cellular telephone, got a message on your pager, checked your email from a PDA or even just seen an advert identified with it, we have all run over a remote information or voice system! In the event that a client, application or organization wishes to make information versatile, portable and open then remote systems administration is the answer. A remote systems administration framework would free of the downtime you would regularly have in a wired system because of link issues. It would likewise spare time and cash because of the way that you would save the cost of introducing a considerable measure of links. Additionally, if a customer PC needs to migrate to another part of the workplace then you should do nothing more than move the machine with the remote system card.

Remote systems administration can end up being extremely helpful in broad daylight places libraries, visitor houses, inns, cafeterias, and schools are all spots where one may discover remote access to the Internet. From a monetary perspective, this is helpful to both the supplier and the customer. The supplier would offer the administration for a charge – most likely on a pay for every utilization framework, and the customer would have the capacity to exploit this administration in a helpful area; far from the workplace or home. A downside of remote Internet is that the QoS (Quality of Service) is not ensured and if there is any impedance with the connection then the association might be dropped.

The two noteworthy sorts of systems in presence are the settled association (which makes utilization of links) and remote systems (which utilize waves to transmit information). The foundation of the unfathomable correspondence system is comprised of altered associations which for the most part use fiber optics and in

addition Ethernet. Indeed, even along these lines, remote systems have increased expanded prominence over the span of the previous decade. Malone (2004) uncovers that as of the year 2000, remote systems were restricted in presence because of the restrictive expense of remote gadgets, for example, incorporated switches and get to focuses and portable workstations. What's more, now a day we can associate portable and tablets moreover. The equipment cost has fundamentally diminished making remote systems moderate to numerous people and association. In addition to this, technological advances have increased the capacity and efficiency of wireless networks which have made them favourably compare with wired networks. This paper will set out to discuss wireless networking with particular focus on the types of wireless technologies commonly employed and the security measures used to protect wireless technology.

Computer Network

A computer network or information system is an information transfers system which permits PC to trade information. In computer network, organized registering gadgets trade information with one another along system join (data connections). The associations between hubs are built up utilizing either link media or remote media. The best-known computer network is the web.

FIG. 1: COMPUTER NETWORKING

Network computer devices that originate, route and terminate the data are called network nodes. Nodes can include hosts suchas personal computer, phone, server as well as networking hardware. Two such devices can be said to be networked together when one device is able to exchange information with the other device, whether or not they have a direct connection to each other.

Computer networks differ in the transmission media used to carry their signals, the communications protocols to organize network traffic, the network's size, topology and organizational intent. In most cases, communications protocols are layered on (i.e. work using) other more specific or more general communications protocols, except for the *physical layer* that directly deals with the transmission media.

Computer networks support applications such as access to the World Wide Web, shared use of application and storage servers, printers, and fax machines, and use of email and instant messaging applications.

PC systems are comprised of interconnected registering gadgets which speak with one another and these systems

are classified by their sizes. This Is the Personal Area Networks (PANs) which reach out to a couple meters and associate nearby gadgets together. Remote PANs make utilization of advancements, for example, Bluetooth to supplant cabling as information is moved from gadget to gadget. Neighbourhood (LANS) reach out from a couple of hundred meters to a couple of kilometres and they were intended to cover structures which are near one another or expansive offices. Wireless LANs are implemented in facilities such as campuses and busy business locations. Metropolitan Area Networks (MANs) connect different buildings and facilities within a city. These networks mostly make use of wired connections with fibre optic transmissions providing the fastest speeds. The biggest networks are Wide Area Networks (WANs) which connect cities and countries together and they typically make use of fibre -optic cables which operate at speeds of up to 40Gbps. And now a days the new network device are invented that is LI-FI. This network works 100 times faster than Wi-Fi. And now the top most speed is 267Gbps

Wireless Networking

A wireless network is any type of computer network that uses wireless data connections for connecting network nodes. Wireless networking is a method by which homes, telecommunications networks and enterprise (business) installations avoid the costly process of introducing cables into a building, or as a connection between various equipment locations. Wireless telecommunications networks are generally implemented and administered using radio communication. This implementation takes place at the physical level (layer) of the OSI model network structure.

Examples of wireless networks include cell phone networks, Wi-Fi local networks and terrestrial microwave

History of wireless networking

- 1971 ALOHA net seminal packet radio system that connected Hawaii islands with a radio network
- 1991 2G cell phone network
- June 1997 802.11 "Wi-Fi" protocol first release
- 1999 803.11 VoIP integration

Wireless Links

Computers are very often connected to networks using wireless links Terrestrial microwave – Terrestrial microwave communication uses Earth-based transmitters and receivers resembling satellite dishes. Terrestrial microwaves are in the low-gigahertz range, which limits all communications to line-of-sight. Relay stations are spaced approximately 48 km (30 mi) apart.

Communications satellites – Satellites communicate via microwave radio waves, which are not deflected by the Earth's atmosphere. The satellites are stationed in space, typically in geosynchronous orbit 35,400 km (22,000 mi) above the equator. These Earth-orbiting systems are capable of receiving and relaying voice, data, and TV signals.

Cellular and PCS systems use several radio communications technologies. The systems divide the region covered into multiple geographic areas. Each area has a low-power transmitter or radio relay antenna device to relay calls from one area to the next area.

Radio and spread spectrum technologies – Wireless local area networks use a high-frequency radio technology similar to

digital cellular and a low-frequency radio technology. Wireless LANs use spread spectrum technology to enable communication between multiple devices in a limited area. IEEE 802.11 defines a common flavour of open-standards wireless radio-wave technology known as Wi-Fi.

Free-space optical communication uses visible or invisible light for communications. In most cases, line-of-sight propagation is used, which limits the physical positioning of communicating devices.

Wireless LANs In The Office

An 802.11 network is the ideal solution for a network administrator in many respects. No longer is it a requirement that every workstation and conference room be wired up to hubs and switches with cables in hard-to-reach areas. Wireless networking allows for impromptu meetings in cafeterias, hallways, courtyards, or wherever inspiration strikes while providing real-time LAN connectivity for business applications such as sending e-mail, working on spread sheets on shared drives, and conducting market research.
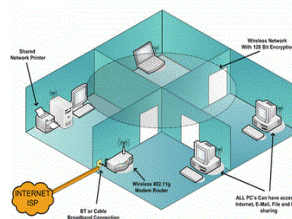

FIG. 2: WLAN IN OFFICE WORKS

Wireless LANs In The Home

Wireless networking has become commonplace, and with prices reduced to a fraction of what they were, it is no wonder that wireless networking products have transitioned from the office and into the home. For the home user, a wireless network provides freedom in convenience and lifestyle to exchange words, data, and music or video with any computer – across the Internet, or around the world. Home users can create a wireless network out of an existing wired network and wirelessly extend the reach of the Internet throughout the home on multiple computers, making it more convenient for ever
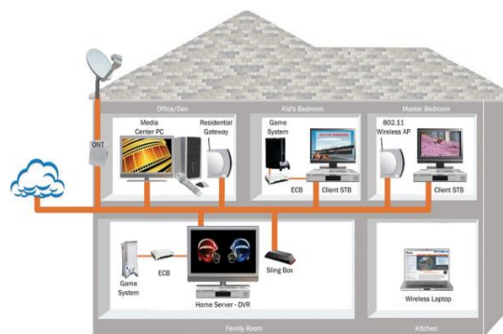

FIG. 3: WLAN IN HOME WORKS

Li-Fi Networking

Li-Fi (Light Fidelity) is a bidirectional, high speed and fully networked wireless communication technologysimilar to Wi-Fi. In this technology we can connect multiple pc in

one network by using light this technology is not much popular as WI-FI but LI-FI is 100 times faster than WI-FI Coined, Li-Fi is a subset of optical wireless communications (OWC) and can be a complement
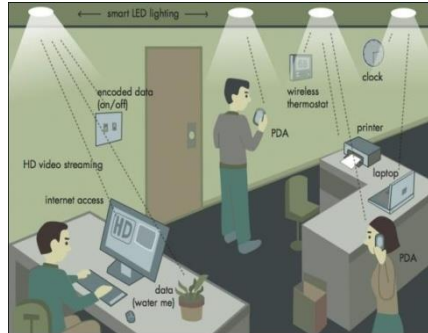

FIG. 4:LI-FI NETWORKING

to RF communication (Wi-Fi or Cellular), or a replacement in contexts of data broadcasting. It is so far measured to be about 100 times faster than Wi-Fi, reaching speeds of 224 gigabits per second.

It is wireless and uses visible light communication or infra-red and near ultraviolet (instead of radio frequency waves) spectrum, part of optical wireless communications technology, which carries much more information, and has been proposed as a solution to the RF-bandwidth limitations. A complete solution includes an industry led standardization process.

Bluetooth Networking

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.
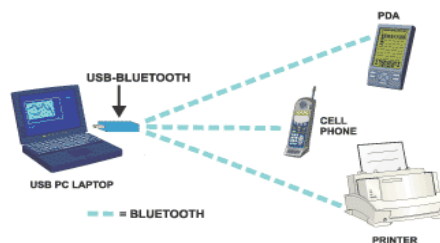

FIG. 5:BLUETOOTH NETWORKING

Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 25,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics. The IEEE standardized

Bluetooth as IEEE 802.15.1, but no longer maintains the standard. The Bluetooth SIG oversees development of the specification, manages the qualification program, and protects the trademarks.A manufacturer must make a device meet Bluetooth SIG standards to market it as a Bluetooth device.A network of patents apply to the technology, which are licensed to individual qualifying devices.

WIMAX Networking

WiMAX (Worldwide Interoperability for Microwave Access) is a family of wireless communications standards initially designed to provide 30 to 40 megabit-per-second data rates, with the 2011 update providing up to 1 Gbit/s for fixed stations. The name "WiMAX" was created by the WiMAX Forum, which was formed in June 2001 to promote conformity and interoperability of the standard. The forum describes WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL". IEEE 802.16m or Wireless MAN-Advanced is a candidate for the 4G, in competition with the LTE Advanced standard.

Uses:

1. The bandwidth and range of WiMAX make it suitable for the following potential applications:
2. Providing portable mobile broadband connectivity across cities and countries through a variety of devices.
3. Providing a wireless alternative to cable and digital subscriber line (DSL) for "last mile" broadband access.
4. Providing data, telecommunications (VoIP) and IPTV services (triple play).
5. Providing a source of Internet connectivity as part of a business continuity plan.
6. Smart grids and metering

Node (Networking)

In communication networks, a node (Latin *nodus*, 'knot') is either a connection point, a redistribution point, or a communication endpoint (e.g. data terminal equipment). The definition of a node depends on the network and protocol layer referred to. A physical network node is an active electronic device that is attached to a network, and is capable of creating, receiving, or transmitting information over a communications channel A passive distribution point such as a distribution frame or patch panel is consequently not a node. The node networking is divided in some following categories:

1. Computer network nodes
2. Telecommunication network nodes
3. Distributed system nodes

1. **Computer Network Nods:**

in data communication, a physical network node may either be a data communication equipment (DCE) such as a modem, hub, bridge or switch; or a data terminal equipment(DTE) such as a digital telephone handset, a printer or a host computer, for example a router, a workstation or a server.

If the network in question is a LAN or WAN, every LAN or WAN node (that is at least data link layer devices) must have a MAC address, typically one for each network interface controller it possesses. Examples are computers, packet switches, xDSL modems (with Ethernet interface) and wireless LAN access points. Note that a hub constitutes a physical network node, but does not constitute a LAN network node, since a hub bed network logically is a bus network.

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Analogously, a repeater or PSTN modem (with serial interface) is a physical network node but not a LAN node in this sense. If the network in question is the Internet or an Intranet, many physical network nodes are host computers, also known as Internet nodes, identified by an IP address and all hosts are physical network nodes. However, some data link layer devices such as switches, bridges and WLAN access points do not have an IP host address (except sometimes for administrative purposes), and are not considered to be Internet nodes or hosts, but as physical network nodes and LAN nodes.

2. Telecommunication Network Nodes

In the fixed telephone network, a node may be a public or private telephone exchange, a remote concentrator or a computer providing some intelligent network service. In cellular communication, switching points and databases such as the Base station controller, Home Location Register, Gateway GPRS Support Node (GGSN) and Serving GPRS Support Node (SGSN) are examples of nodes. Cellular network base stations are not considered to be nodes in this context.
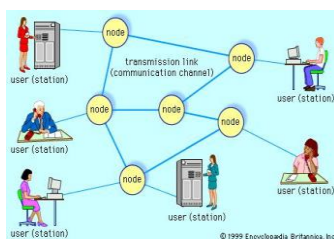

FIG. 6:Telecommunication network nodes

In cable television systems (CATV), this term has assumed a broader context and is generally associated with a fibre optic node. This can be defined as those homes or businesses within a specific geographic area that are served from a common fibre optic receiver. A fibre optic node is generally described in terms of the number of "homes passed" that are served by that specific fibber node.

3. Distributed System Nodes

If the network in question is a distributed system, the nodes are clients, servers or peers. A peer may sometimes serve as client, sometimes server. In a **peer-to-peer** or overlay network, nodes that actively route data for the other networked devices as well as themselves are called super nodes.

Distributed systems may sometimes use *virtual nodes* so that the system is not oblivious to the heterogeneity of the nodes. This issue is addressed with special algorithms, like consistent, as it is the case in Amazon's.

Feature of WI-FI

Convenience– The wireless nature of such networks allows users to access network resources from nearly any convenient location within their primary networking environment
(a home or office). With the increasing saturation of laptop-style computers, this is particularly relevant.

Mobility– With the emergence of public wireless networks, users can access the internet even outside their normal work environment. Most chain coffee shops, for example, offer their customers a wireless connection to the internet at little or no cost.

Productivity– Users connected to a wireless network can maintain a nearly constant affiliation with their desired network as they move from place to place. For a business, this implies that an employee can potentially be more productive as his or her work can be

accomplished from any convenient location.

Deployment– Initial setup of an infrastructure-based wireless network requires little more than a single access point. Wired networks, on the other hand, have the additional cost and complexity of actual physical cables being run to numerous locations (which can even be impossible for hard-to-reach locations within a building).

Expandability– Wireless networks can serve a suddenly-increased number of clients with the existing equipment. In a wired network, additional clients would require additional wiring.

Cost– Wireless networking hardware is at worst a modest increase from wired counterparts. This potentially increased cost is almost always more than outweighed by the savings in cost and labor associated to running physical cables.

CONCLUSION

In this paper we cam discus about the various type of wireless networking and there implementation. In that we see WI-FI, Bluetooth, WI-MAX, Mobile data and newest one LI-FI. We also see the various types of Node (Networking) and also the uses of that.

From discussion provided in this paper it is clear that the invention of wireless networking and their freedom are increasing in popularity as they become more cost efficient and afforded by many people .in that we can see we have more trouble for wired networking but in case of wireless networking we free to use that network anywhere that's why the wireless networking is most efficient than wired networking

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