The role of youth in realizing dreams of abdulkalam

Life, Adolescence

A computer network is a telecommunications network that allows computers to exchange data. The physical connection between networked computing devices is established using either cable media or wireless media. The best-known computer network is the Internet. Network devices that originate, route and terminate the data are called network nodes. [1] Nodes can include hostssuch as servers and personal computers, as well as networking hardware. Two devices are said to be networked when a process in one device is able to exchange information with a process in another device.

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. The remainder of this article discusses local area network technologies and classifies them according to the following characteristics: the physical media used to transmit signals, the communications protocols used to organize network traffic, along with the network's size, its topology and its organizational intent.

Thecommunicationmedia used to connect devices to form a computer network include electrical cable (HomePNA, power line communication, G. hn), optical fiber (fiber-optic communication), and radio waves (wireless networking). In the OSI model, these are defined at layers 1 and 2 — the physical layer and the data link layer. A widely-adoptedfamilyof communication media used in local area network (LAN)technologyis collectively known as Ethernet. The media and protocol standards that

enable communication between networked devices over Ethernet is defined by IEEE 802.

Ethernet encompasses both wired and wireless LAN technologies. Wired LAN devices transmit signals over cable media. Wireless LAN devices use radio waves or infrared signals as a transmission medium. Wired technologies[edit] The order of the following wired technologies are, roughly, from slowest to fastest transmission speed. Twisted pair wire is the most widely used medium for all telecommunication. Twisted-pair cabling consist of copper wires that are twisted into pairs. Ordinary telephone wires consist of two insulated copper wires twisted into pairs. Computer network cabling (wired Ethernet as defined by IEEE 802.) consists of 4 pairs of copper cabling that can be utilized for both voice and data transmission. The use of two wires twisted together helps to reducecrosstalk and electromagnetic induction. The transmission speed ranges from 2 million bits per second to 10 billion bits per second. Twisted pair cabling comes in two forms: unshielded twisted pair (UTP) and shielded twisted-pair (STP). Each form comes in several category ratings, designed for use in various scenarios. Coaxial cable is widely used for cable television systems, office buildings, and other work-sites for local area networks.

The cables consist of copper or aluminum wire surrounded by an insulating layer (typically a flexible material with a high dielectric constant), which itself is surrounded by a conductive layer. The insulation helps minimize interference and distortion. Transmission speed ranges from 200 million bits per second to more than 500 million bits per second. ITU-T G. hn technology

uses existing home wiring (coaxial cable, phone lines and power lines) to create a high-speed (up to 1 Gigabit/s) local area network. An optical fiber is a glass fiber. It uses pulses of light to transmit data.

Some advantages of optical fibers over metal wires are less transmission loss, immunity from electromagnetic radiation, and very fast transmission speeds of up to trillions of bits per second. One can use different colors of lights to increase the number of messages being sent over a fiber optic cable. Wireless technologies[edit] Main article: Wireless network 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 flavor of open-standards wireless radio-wave technology. Infrared communication can transmit signals for small distances, typically no more than 10 meters.

In most cases, line-of-sight propagation is used, which limits the physical positioning of communicating devices. A global area network (GAN) is a network used for supporting mobile across an arbitrary number of wireless LANs, satellite coverage areas, etc. The key challenge in mobile communications is handing off user communications from one local coverage area to the next. In IEEE Project 802, this involves a succession of terrestrial wireless LANs. [6] Bluetooth is managed by the Bluetooth Special Interest Group, which has more than 18, 000 member companies in the areas of telecommunication, computing, networking, and consumer electronics. 3]Bluetooth was standardized as IEEE 802. 15. 1, but the standard is no longer maintained. The SIG oversees the development of the specification, manages the qualification program, and protects the trademarks. [4]To be marketed as a Bluetooth device, it must be qualified to standards defined by the SIG. [citation needed]A network of patents is required to implement the technology and are licensed only for those qualifying devices. Coaxial cable, or coax (pronounced 'ko. ? ks), is a type of cable that has an inner conductor surrounded by a tubular insulating layer, surrounded by a tubular conducting shield.

Many coaxial cables also have an insulating outer sheath or jacket. The term coaxial comes from the inner conductor and the outer shield sharing a geometric axis. Coaxial cable was invented by English engineer and mathematician Oliver Heaviside, who patented the design in 1880. [1] Coaxial cable differs from other shielded cable used for carrying lower-frequency signals, such as audio signals, in that the dimensions of the cable are controlled to give a precise, constant conductor spacing, which is needed for it to function efficiently as a radio frequency transmission line.

Coaxial cable is used as a transmission line for radio frequency signals. Its applications include feedlines connecting radio transmitters and receivers with their antennas, computer network (Internet) connections, and distributing cable television signals. One advantage of coax over other types of radiotransmission line is that in an ideal coaxial cable the electromagnetic field carrying the signal exists only in the space between the inner and outerconductors. This allows coaxial cable runs to be installed next to metal objects such as gutters without the power losses that occur in other types of transmission lines.

Coaxial cable also provides protection of the signal from external electromagnetic interference. Twisted pair cabling is a type of wiring in which two conductors of a single circuit are twisted together for the purposes of canceling out electromagnetic interference (EMI) from external sources; for instance, electromagnetic radiation from unshielded twisted pair (UTP) cables, and crosstalk between neighboring pairs. It was invented by Alexander Graham Bell. An optical fiber (or optical fibre) is a flexible,

transparent fiber made of high quality extruded glass (silica) or plastic, slightly thicker than a human hair.

It can function as a waveguide, or “ light pipe”,[1] to transmit light between the two ends of the fiber. [2] The field of appliedscienceand engineering concerned with the design and application of optical fibers is known as fiber optics. Optical fibers are widely used in fiber-optic communications, which permits transmission over longer distances and at higher bandwidths (data rates) than other forms of communication. Fibers are used instead of metal wires because signals travel along them with less loss and are also immune to electromagnetic interference.

Fibers are also used for illumination, and are wrapped in bundles so that they may be used to carry images, thus allowing viewing in confined spaces. Specially designed fibers are used for a variety of other applications, including sensors and fiber lasers. Microwave transmission refers to the technology of transmitting information or energy by the use of radio waves whose wavelengths are conveniently measured in small numbers of centimetre; these are calledmicrowaves. This part of the radio spectrum ranges across frequencies of roughly 1. gigahertz (GHz) to 30 GHz. TMicrowaves are widely used for point-to-point communications because their small wavelength allows conveniently-sized antennas to direct them in narrow beams, which can be pointed directly at the receiving antenna. This allows nearby microwave equipment to use the same frequencies without interfering with each other, as lower frequency radio waves do. Another advantage is that the high frequency of microwaves gives the microwave

band a very large nformation-carrying capacity; the microwave band has a bandwidth 30 times that of all the rest of the radio spectrum below it.

A disadvantage is that microwaves are limited to line of sight propagation; they cannot pass around hills or mountains as lower frequency radio waves can. Microwave radio transmission is commonly used in point-to-point communication systems on the surface of the Earth, in satellite communications, and indeep space radio communications. Other parts of the microwave radio band are used for radars, radio navigation systems, sensor systems, and radio astronomy. ese correspond to wavelengths from 30 centimeters down to 1. 0 cm. Wireless network refers to any type of computer network that uses wireless (usually, but not always radio waves) for network connections. It 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. [1] Wirelesstelecommunications networks are generally implemented and administered using radio communication.

This implementation takes place at the physical level (layer) of the OSI model network structure. [2] Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength radio transmissions in the ISM band from 2400–2480 MHz) from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. Created by telecom vendor Ericssonin 1994,[2] it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

Wi-Fi, also spelled Wifi or WiFi, is a popular technology that allows an electronic device to exchange data or connect to the internet wirelessly using radio waves. The Wi-Fi Alliance defines Wi-Fi as any " wireless local area network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers' (IEEE)802. 11 standards". [1] However, since most modern WLANs are based on these standards, the term " Wi-Fi" is used in general English as a synonym for " WLAN". Only Wi-Fi products that complete Wi-Fi Allianceinteroperability certification testing successfully may use the " Wi-Fi CERTIFIED" trademark.

A device that can use Wi-Fi (such as a personal computer, video-game console, smartphone, digital camera, tablet or digital audio player) can connect to a network resource such as the Internet via a wireless network access point. Such an access point (or hotspot) has a range of about 20 meters (65 feet) indoors and a greater range outdoors. Hotspot coverage can comprise an area as small as a single room with walls that block radio waves or as large as many square miles — this is achieved by using multiple overlapping access points.