

MODERN TOPICS

Multiple Choice Type Questions

1. IEEE 802.7 slandered for
a) broadband b) fiber optic c) Bluetooth

[WBUT 2016]
d) CSMA

Answer: (a)

2. Blue-tooth uses To communicate between two devices.

- a) Radiowave
b) Microwave
c) Infrared
d) none of these, a separate technology exists

[MODEL QUESTION]

Answer: (a)

Short Answer Type Questions

1. Compare the piconet and a scatternet in Bluetooth communication. What is the difference between a BSS and an ESS?

[WBUT 2014, 2015]

Answer:

1st Part:

Piconet is a small Bluetooth network, which has a primary and up to seven secondary stations. All the secondary stations synchronize their clocks and hopping sequence with the primary.

Scatternet is made up of at least two piconets networks. A secondary station in one piconet can be the primary in another piconet. Also, a station can be a member of two piconets.

2nd Part:

The differences between wireless topologies BSS and ESS are as follows:

BSS (Basic Service Set) consists of a single, central access point and wireless clients. BSS is also called infrastructure mode, and connects wireless clients to wired infrastructure. ESS (Extended Service Set) consists of multiple BSS networks connected together. ESS can cover a wide area and allows for roaming between access points.

2. What is hand off in cellular telephony?

[MODEL QUESTION]

Answer:

As a mobile user moves from one service area to the next, a hand-off occurs from one service area to the next. The hand-off would disrupt the call for 100 to 200 ms. This is just enough to disrupt the carrier detect (CD) cycle; hence, the modem assumes that one of the callers has disconnected, and it hangs up. This problem can be overcome similar to fax modems over cellular links. The modem will delay 400 ms before hanging up, giving the hand-off enough time to take place. Some data might be affected, but error detection,

and error correction procedures (CRCs) will detect and correct the data bits that have been corrupted. But, all these techniques lower the effective throughput of our communication system and the effective throughputs achieved with cellular modems hover around 19200 bits/s

Long Answer Type Questions

1. Write short notes on the following:

- Bluetooth
- ISDN
- Cable Modem
- Distributed system
- Satellite transmission

[WBUT 2014]

[MODEL QUESTION]

[MODEL QUESTION]

[MODEL QUESTION]

[MODEL QUESTION]

Answer:

a) **Bluetooth:**

Bluetooth is an industrial specification for wireless personal area networks (PANs). Bluetooth provides a way to connect and exchange information between devices like personal digital assistants (PDAs), mobile phones, laptops, PCs, printers and digital cameras via a secure, low-cost, globally available short range radio frequency.



A typical Bluetooth mobile phone headset



A Bluetooth mouse

Bluetooth is a radio standard primarily designed for low power consumption, with a short range (power class dependent: 10 centimeters, 10 meters, 100 meters) and with a low-cost transceiver microchip in each device.

Bluetooth lets these devices talk to each other when they come in range, even if they are not in the same room, as long as they are within up to 100 meters of each other, dependent on the power class of the product. Products are available in one of three power classes:

Class	Power (mW)	Power (dBm)	Range (approximate)
Class 1	100 mW	20 dBm	~100 meters
Class 2	2.5 mW	4 dBm	~10 meters
Class 3	1 mW	0 dBm	~10 cm (1 meter max)

Bluetooth Application

- Wireless networking between desktops and laptops, or desktops in a confined space and where little bandwidth is required
- Bluetooth peripherals such as printers, mice and keyboards
- Bluetooth cell phones have been sold in large numbers, and are able to connect to computers, personal digital assistants (PDAs), certain automobile handsfree

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systems and various other devices. The standard also includes support for more powerful, longer-range devices suitable for constructing wireless LANs.

- Certain mp3 players and digital cameras to transfer files to and from computers
- Bluetooth headsets for mobile phones and smartphones
- Some testing equipment is Bluetooth enabled
- Some medical applications are under development

b) ISDN:

Integrated Services Digital Network (ISDN) is a type of circuit switched telephone network system, designed to allow digital transmission of voice and data over ordinary telephone copper wires, resulting in better quality and higher speeds than available with analog systems. More broadly, **ISDN** is a set of protocols for establishing and breaking circuit switched connections, and for advanced call features for the user. In a videoconference, ISDN provides simultaneous voice, video, and text transmission between individual desktop videoconferencing systems and group (room) videoconferencing systems.

Configurations

In ISDN, there are two types of channels, *B* (for "Bearer") and *D* (for "Delta"). *B channels* are used for data (which may include voice), and *D channels* are intended for signalling and control (but can also be used for data).

There are two kinds of access to ISDN. **Basic rate interface (BRI)** — also **Basic rate access (BRA)** — consists of two *B* channels, each with bandwidth of 64 kbit/s, and one *D* channel with a bandwidth of 16 kbit/s. Together these three channels can be designated as 2B+D. **Primary rate interface (PRI)** — also **Primary rate access (PRA)** — contains a greater number of *B* channels and a *D* channel with a bandwidth of 64 kbit/s.

c) Cable Modem:

A **cable modem** is a special type of modem that is designed to modulate a data signal over cable television infrastructure. Cable modems are primarily used to deliver broadband Internet access, taking advantage of unused bandwidth on a cable television network.

In practice, cable modems and DSL differ little and are both superior alternatives to dial-up access. Both offer snappy 40-70ms response, or the round-trip time of a data packet sent to a server. Dial-up is a more sluggish 150-400ms.

There is greater differentiation in bandwidth, or the rate at which one can send and receive data, between cable and the various types of DSL. A dial-up modem can download and upload at some 40 kbs, or 0.04 Mbs. Cable modems across most services consistently attain 3-6 Mbs down / 0.3-0.4 MBs up. There are few attempts to offer different service tiers beyond the traditional 'home' and 'business' designations.



In comparison, DSL tends to offer less speed and more variance between service packages and prices. Service quality is also far more dependent on your location in relation to the local ISP.

There are three traditional disadvantages to cable internet:

- Users in a neighborhood share the available bandwidth provided by a single coaxial cable line. Therefore, connection speed can vary depending on how many people are using the service at the same time.
- Cable networks using a shared line risk a loss of privacy, especially in light of the availability of hacking tools for cable modems. This issue is addressed by encryption and other privacy features specified in the DOCSIS (Data Over Cable Service Interface Specification) standard used by most cable modems.
- Many cable Internet providers are reluctant to offer cable modem access without tying it to a cable television subscription. This has ramifications similar to those of the lack of naked DSL.

d) Distributed System:

Distributed computing is a field of computer science that studies distributed systems. A distributed system consists of multiple autonomous computers that communicate through a computer network. The computers interact with each other in order to achieve a common goal. A computer program that runs in a distributed system is called a distributed program, and distributed programming is the process of writing such programs.

Distributed computing also refers to the use of distributed systems to solve computational problems. In distributed computing, a problem is divided into many tasks, each of which is solved by one computer.

There are two main reasons for using distributed systems and distributed computing. First, the very nature of the application may require the use of a communication network that connects several computers. For example, data is produced in one physical location and it is needed in another location.

Second, there are many cases in which the use of a single computer would be possible in principle, but the use of a distributed system is beneficial for practical reasons. For example, it may be more cost-efficient to obtain the desired level of performance by using a cluster of several low-end computers, in comparison with a single high-end computer. A distributed system can be more reliable than a non-distributed system, as there is no single point of failure. Moreover, a distributed system may be easier to expand and manage than a monolithic uniprocessor system.

Examples of distributed systems and applications of distributed computing include the following:

- Telecommunication networks.
- Telephone networks and cellular networks.
- Computer networks such as the Internet.
- Wireless sensor networks.
- Routing algorithms.

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- Network applications.
- World Wide Web and peer-to-peer networks.
- Massively multiplayer online games and virtual reality communities.
- Distributed databases and distributed database management systems.
- Network file systems.
- Distributed information processing systems such as banking systems and airline reservation systems.

e) Satellite transmission:

In Satellite transmission, signal transferring between the sender and receiver is done with the help of satellite. In this process, the signal which is basically a beam of modulated microwaves is sent towards the satellite. Then the satellite amplifies the signal and sent it back to the receiver's antenna present on the earth's surface. So, all the signal transferring is happening in space. Thus this type of communication is known as space communication.

Two satellites which are commonly used in satellite communication are Active and passive satellites.

