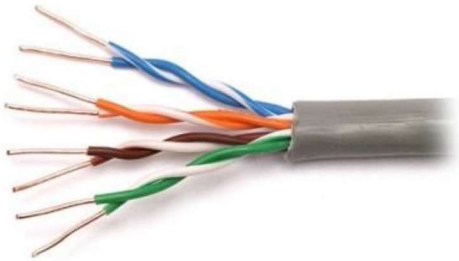
# UNIT 4 NETWORKING MEDIA and HARDWARE

## A Discussion Starter

What are networking media?

What do wireless signals use to be sent?

Match the following words: *fiber-optic, twisted-pair* and *coaxial cable* to pictures A, B, C. Comment on the pictures given below and compare the use of these media.



**A**


**B**

**C**

**D**

**E**

## B Before You Read

What are advantages and disadvantages of Wireless Networking (Wi-Fi)?

What do you know about 5G Technology?

## C Read the Article

### *5G Technology*


Radio technologies have evidenced a rapid and multidirectional evolution with the launch of the analogue cellular systems in 1980s. Thereafter, digital wireless communication systems are consistently on a mission to fulfil the growing need of human beings (1G…4G, or now 5G).

The Fifth Generation technology has many salient features potential enough to solve many of the problems of our mundane life. In comparison to previous radio technologies, 5G has following advancement − practically possible to avail the super speed i.e. 1 to 10 Gbps; latency will be 1 millisecond (end-to-end round trip); 1,000x bandwidth per unit area; feasibility to connect 10 to 100 number of devices; worldwide coverage; about 90% reduction in network energy usage; battery life will be much longer; whole world will be in Wi-Fi zone. As researchers say, with the wide range of bandwidth radio channels, the 5G Wi-Fi technology will offer contiguous and consistent coverage − "wider area mobility in true sense."

Architecture of 5G is highly advanced, its network elements and various terminals are characteristically upgraded to afford a new situation. Likewise, service providers can implement the advance technology to adopt the value-added services easily.

However, upgradeability is based upon cognitive radio technology that includes various significant features such as ability of devices to identify their geographical location as well as weather, temperature, etc. Cognitive radio technology acts as a transceiver (beam) that perceptively can catch and respond radio signals in its operating environment. Further, it promptly distinguishes the changes in its environment and hence respond accordingly to provide uninterrupted quality service.

The system model of 5G is entirely IP based model designed for the wireless and mobile networks. The system comprising of a main user terminal and then a number of independent and autonomous radio access technologies. Each of the radio technologies is considered as the IP link for the outside internet world. The IP technology is designed exclusively to ensure sufficient control data for appropriate routing of IP packets related to a certain application connections, i.e. sessions between client applications and servers somewhere on the Internet. Moreover, to make accessible routing of packets should be fixed in accordance with the given policies of the user.

The 5G MasterCore is convergence point for the other technologies, which have their own impact on existing wireless network. Interestingly, its design facilitates MasterCore to get operated into parallel multimode including all IP network mode and 5G network mode. In this mode, it controls all network technologies of RAN and Different Access Networks (DAT). Since, the technology is compatible and manages all the new deployments (based on 5G), it is more efficient, less complicated, and more powerful.

Surprisingly, any service mode can be opened under 5G New Deployment Mode as World Combination Service Mode (WCSM). WCSM is a wonderful feature of this technology; for example, if a professor writes on the white board in a country – it can be displayed on another white board in any other part of the world besides conversation and video. Further, new services can be easily added through parallel multimode service.

The 5th generation technology is designed to provide incredible and remarkable data capabilities, unhindered call volumes, and immeasurable data broadcast within the latest mobile operating system. Hence, it is more intelligent technology, which will interconnect the entire world without limits. Likewise, our world would have universal and uninterrupted access to information, communication, and entertainment that will open a new dimension to our lives and will change our life style meaningfully.

5G is the forthcoming revolution of mobile technology. The features and its usability are much beyond the expectation of a normal human being. With its ultra-high speed, it is potential enough to change the meaning of a cell phone usability.

With a huge array of innovative features, now your smart phone would be more parallel to the laptop. You can use broadband internet connection; other significant features that fascinate people are more gaming options, wider multimedia options, connectivity everywhere, zero latency, faster response time, and high quality sound and HD video can be transferred on other cell phone without compromising with the quality of audio and video.

Moreover, governments and regulators can use this technology as an opportunity for the good governance and can create healthier environments, which will definitely encourage continuing investment in 5G, the next generation technology.

Normally, it is expected that the time period required for the 5G technology development and its implementation is about two years more from now (by 2020). But to becoming usable for the common people in developing countries, it could be even more.

(See more at: https://www.tutorialspoint.com/5g/5g_quick_guide.htm, http://www.eweek.com, https://www.nbcnews.com/mach/tech/what-5g-next-wireless-revolution-explained-ncna855816 )

## D Comprehension Check

Answer the following questions.

1. Which features make 5G Technology different from the previous ones?
2. How is this technology designed? What is its primary goal?
3. Why is 5G Technology so beneficial?
4. How will the fifth generation of mobile communication networks influence our future life?
5. When is it expected to be implemented?

## E Use of Language Practice

**i** ***Form as many derivatives as you can from the words in the table below. Make up your own sentences with them.***

| Verbs | Nouns | Adjectives | Adverbs |
|---|---|---|---|
| | | consistent | |
| | feasibility | | |
| | | | perceptively |
| upgrade | | | |
| | latency | | |
| avail | | | |
| | | sufficient | |
| | deployment | | |
| substantiate | | | |
| | | | meaningfully |
| | | immeasurable | |

**ii** ***Name networking hardware and explain what they are used for.***

**a**


**b**

**c**


**d**

**e**

**f**

**iii** ***Choose the correct alternative to complete each sentence.***

***Consider both the grammar and the meaning of each option.***

***Why IT Hardware Spending Will Increase?***

While undoubtedly enterprises are **(1) moving / moved / movement** software applications from "on-premises data centers to the cloud." Currently, 21 percent of **(2) computers** / **calculating** / **computing** is accomplished in the cloud. That number will indeed **(3) changeable** / **rise / decrease** and should be 44 percent by 2021.

**(4) As a result** / **However / On the whole**, because enterprise cloud plans are beginning to solidify, or become less **(5) forgetful** / **vague / vaguely**, firms are now ready to upgrade the IT gear they are retaining or think they'll need. They aren't **(6) abandoned** / **left** / **abandoning** on-premises computing. Instead, many are adopting a hybrid IT **(7) model / type /example** in which applications move between a public cloud and their own internal data **(8) centric / centers / set**. Other factors coming into play and contributing to the optimism include more cash being **(9) available / availed / unavailable** because of tax law changes in the U.S. and advantages to depreciating equipment costs in the first year **(10) by / through / due to** economic growth.

A weak dollar and lower memory costs are also helping the shift. **(11) Interesting** / **Important** / **Interestingly**, the firm also writes of a shift overall away from consumer-oriented tech cycles to "an era of industrial **(12) innovatory / innovation / innovator**." It's talking about artificial intelligence, the Internet of Things (IoT), and so on. With cloud, enterprise managers can hand over what could become **(13) increasingly/ increasing / increased** intricate processes to specialists. For example, some businesses don't think they have the right skills **(14) to / at / about** IoT. As a result, they are increasing their use of collaborators, IoT service provider Vodafone claims.

**iv** ***Compare OSI and TCP/IP Reference Models in the table and fill in the gaps:***

| **OSI (Open System Interconnection)** | **TCP/IP (Transmission Control Protocol / Internet Protocol)** |
|---|---|
| 1. OSI is a generic, protocol independent standard, acting as a communication gateway between the network and end user. | |
| | 2. In TCP/IP model the transport layer does not guarantee delivery of packets. Still the TCP/IP model is more reliable. |
| | 3. Follows horizontal approach. |

| | |
|---|---|
| 4. OSI model has a separate Presentation layer and Session layer. | |
| | 5. TCP/IP model is, in a way implementation of the OSI model. |
| 6. Network layer of OSI model provides both connection oriented and connectionless service. | |
| | 7. TCP/IP model does not fit any protocol |
| 8. Protocols are hidden in OSI model and are easily replaced as the technology changes. | |
| 9. OSI model defines services, interfaces and protocols very clearly and makes clear distinction between them. The protocol is independent. | |
| | 10. It has 4 layers |

**F Web Research Activity**

Divide into two groups.

These are two issues each group should support and prove, using some information from the Internet:

- The potential dangers of Wi-Fi.
- Don’t worry: Wi-Fi isn’t dangerous!

Make up a table of pros and cons of Wi-Fi:

| Pros | Cons |
|---|---|
| | |

## G Speaking Test

- Dwell on the significant applications of 5G technology in the future.
- Do you know what can slow Wi-Fi network? Can you prevent it?
- Interference with wireless devices is happening much more often than in the past. If devices that use unlicensed radio frequencies interfere with each other, whose fault is it? The individual for buying multiple products that use the same radio frequency? The manufacturers for not ensuring their products can switch channels as needed to use a free channel? The government for allowing unregulated airwaves?
- Is there a solution to this problem? Who, if anyone, should be responsible for fixing this problem?

## H Home Writing Assignment

Research the theme ***"The Advantages and Disadvantages of 5G High-Speed Wireless Technology".***

Prepare an essay or make a presentation in class featuring a worldwide impact of this technology.