

## Network Essentials Chapter 4A Review

Name \_\_\_\_\_

1. The OSI Model has **7 layers**, while the TCP/IP model has **4 layers**. For both the models, the lowest layer or Layer 1 is the **Physical** layer.
2. At this layer, data are transmitted in the form of **binary** bits, such as 01100100101. Each bit is an **electrical** signal. A 0 (zero) represents **no voltage**, while a 1 represents a **none-zero voltage**.
3. Hardware related to this layer are **routers, switches, modems, cables, repeaters**, etc.
4. There are **5** networking standards used in this layer.
5. A **router** allows devices to be connected physically to a **network**, using wired or wireless methods.
6. Data or bits are transmitted using any of these 3 **media**:
  - **copper cables** (using electrical signals)
  - **fibre-optic cables** (using light pulses)
  - **microwave transmission** (using microwave signals)

What are found in the Physical layer? *Cables, switches, routers, repeaters, modems, devices, NIC, wireless signals*

7. Bandwidth is the speed of data **transmission**. **Greater** bandwidth means faster downloading, faster uploading, faster streaming, etc. It is measured in bits/second or bps.

Unit of bandwidth	Abbreviation	Equivalence
Bit per second	Bps	
Kilobits per second	Kbps	1000bps
Megabits per second	Mbps	1000000 bps
Gigabits per second	Gbps	1000000000bps
Terabits per second	Tbps	1000000000000bps

8. A broadband service is rated at 1gbps, but the actual speed is 600Mbps. This is the **throughput**.
9. Three types of copper cables used in the Physical Layer are:
  - Unshielded **Twisted** Pair (UTP) cable
  - **Shielded** Twisted Pair (STP) cable
10. Signals flowing in a cable can have disturbance from electric or magnetic fields from another circuit cable. This is known as **crosstalk**.

11. Speeds supported by different cables.

Cable	Speed	Bandwidth	
Cat 3 (UTP)	10 Mbps	16MHz	
Cat 5 (UTP)	100Mbps	100MHz	
Cat 5e (UTP)	1000Mbps	100MHz	Lower crosstalk than Cat 5
Cat 6 (UTP)	10000Mbps (55m)	250MHz	Lower crosstalk than Cat 5e
Cat 6a (UTP)	10000Mbps (55m)	500MHz	
Cat 7 (ScTP)	10000Mbps	600MHz	

12. Which of the following are used in the Physical Layer (Layer 1)?

Copper cables, PCs, wireless signals, frames, routers, switches, segments, data, packets, fiber optic cables, repeaters, Unshielded Twisted Pair (UTP) Cable, Coaxial Cable, Shielded Twisted Pair (STP) cable

13. Safety codes Dictate that data cables and electrical power cables must be **separated**.

14. Three types of wireless media are **Wifi** (up to 7Gbps), **Bluetooth** (up to 3Mbps) and **WiMax** (up to 1Gbps).

15. There are two ways of **terminating** UTP cables: T568A and T568B.

16. An ethernet **straight** cable has a both ends of T568A or T568B. An ethernet **crossover** cable has one end T568A and the other end T568B. A **rollover** cable is Cisco proprietary.

17. Fibre-optic communication involves transmitting information by sending **pulses of light** through an optical fiber. Info can be carried over **long** distances.

19. The two types of fibre-optic cables are **single-mode** and **multimode** type.

The single-mode type **offers longer distances transmission**. The device for **testing** fibre cables is known as the Optical Time Domain Relectometer.

20 The 4 types of connectors used fiber cables are **ST connectors, SC connectors, LC connectors and Duplex Multimode LC Connectors**.

21. Wireless transmission allows convenience with mobile devices, but coverage area is **limited**. Signals can also have interference from electrical signals. It is also vulnerable to hacking.