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| NWEG ASSIGNMENT  ST10053561 |
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NETWORKING ASSIGNMENT OPERATING SYSTEMS

# What is the difference between Coaxial cable and Fiber-optic cable?

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| **Criteria** | **Fibre optic cable** | **Coaxial cable** |
| Attenuation | According to (Tech difference, 2018) The transmission distance is significantly longer than any other-directed medium. A signal in an optical fibre connection can travel for kilometres without needing to be regenerated. | According to (Tech difference, 2018) The frequency and length of a coaxial cable affect its attenuation. The attenuation increases as the work frequency increases. |
| Data transmission rate | According to (Tech difference, 2018) Fibre optic cables with data transfer rates of up to 2gbps are available.  It has a larger data transmission capacity than a coaxial wire. | According to (Tech difference, 2018) The data transmission rate of a coaxial cable can reach 44.736 megabits per second.  In comparison to fibre optic cable, it has a low data transfer rate capability. |
| Bandwidth | According to (Tech difference, 2018) Fibre optic cable has a greater bandwidth.  The faster the transmission rate, the higher the bandwidth. | According to (Tech difference, 2018) The bandwidth of coaxial cable is moderate.  When compared to fibre optic cable, it does not give a much quicker transmission rate. |
| Cost | According to (Tech difference, 2018) Optical fibre is costly because it must be properly made, and a laser light source is expensive. | According to (Tech difference, 2018)When compared to fibre optic cable, coaxial cable is less expensive. |
| Installation of cable | According to (Tech difference, 2018) Fibre optic cable installation is more complicated and time-consuming.  All the joints must be flawlessly polished, aligned, and light-tightly sealed. | According to (Tech difference, 2018) Coaxial cables are simple to install and maintain because they really do not require any special tools for cutting and crimping. |

# What are the most common types of software license agreements?

According to the (Snyk limited, 2020), the most common type of software license agreements is “Public Domain License”,” LGPL”,” Permissive”, “Copyleft”, and “Proprietary”.

## Public Domain License:

This software is designed as being in the public domain, anybody can freely use it without any restrictions on it. However, for specific reasons, businesses should practice alert while talking about Public Domain License in the project or other significant applications.

Public domain software may not necessarily stick to the best coding practices, or it may not provide the secure programming that which application requires.

This software contains a security risk because due to the free software people can misuse the code.

## Permissive:

One of the most well recognized and well-known open-source programming licenses is this one. It also incorporates the "Apache" or "BSD" style, which is included with the Permissive license. The distribution of the program is subject to a few restrictions or regulations under this license.

## Copyleft:

The copyleft licensing agreement has a lot of limitations. Under the terms of a copyleft license, licensed code may be changed or distributed as part of a software project, if the new code is released under the same software license.

## Proprietary:

These software licenses make it illegal to copying, modify, or distribute. This type of software has extra restrictions since it protects the developer or owner from unlawful software use.

## Gnu lesser public license (LGPL):

According to the LGPL license, developers have the right to link to open-source libraries from their software under the LGPL license. When projects are produced or linked to include an LGPL-licensed library, the resulting code can be licensed under any other sort of license even a proprietary software license.

# Show the sequence of start, data, and stop bits that are generated during asynchronous transmission of the character string “LUNCH.”



# List at least two (2) examples each of simplex, half-duplex, and full-duplex connections

According to (Theodore Kelechukwu Onyejaku, 2021), It states that data transmission can occur in a variety of ways, including one-way data transmission, in which only one device can send data. Two-way communication is also possible, where both devices can communicate data at the same time. Another scenario is that both devices can send data at the same time, but not simultaneously.

## Simplex Mode:

Simplex mode, often known as single mode, is a transmission mode in which data is delivered in only one direction. This indicates that just one device, not both, sends information across the channel. One is the single sender, while the other is the only receiver.

Examples: Radio broadcasting, Loudspeaker, Television broadcasting, Monitor output, and Fire alarm system.

## Half-Duplex mode

Both communication endpoints can communicate data in half-duplex mode, but not simultaneously. This means that one device can only send while the other can only receive and vice versa.

Example: A walkie-talkie, two-way radio that has a push to talk button, USB

## Full-Duplex Mode

Full duplex mode allows both interacting devices to send and receive data at the same time. one of the devices does not have to wait for the other before replying. This indicates that communication is not delayed.

Example: Video calls, Audio calls, Live charts.

# List all the different network connections involved in this operation.

Wireless connection from laptop to receiving antenna.

Microcomputer to LAN connection - receiving antenna to local area network

LAN to LAN links is used in a company network.

LAN to WAN link for business Internet access.

Q What are the chrematistics, advantages, and disadvantages of the following?

## Circuit-switched network:

A communication network in which a dedicated circuit is established between sender and receiver, and all data passes over this circuit (White, 2016, pp. 241 - 251).

Advantages: àCircuit dedicated to connection no inference  
àGuaranteed full bandwidth for the duration of transmission  
àGuaranteed quality of service.

Disadvantages:  àBlocked connections if a circuit is unavailable.

àWasted bandwidth

à Communication is disabled until the link is established.

Datagram Packet-switched network: A communications network in which packets are sent independently based on certain routing criteria, allowing each data packet to travel through the network on its own, perhaps unique path (White, 2016, pp. 241-251).

Advantages: àThere is no need to wait for the connection to become available.

àAllows for the most efficient use of existing infrastructure

àEmails and texts can still be sent during a crisis.

Disadvantages: àIt Delays under heavy use  
àPackets can get lost/corrupted  
àProtocols needed for reliable transfer  
àNot good for some data streams

## Virtual Packet Switched network:

A packet-switched network connection that is not a dedicated physical link, but rather a logical connection generated by using the routing tables in each node/router along the path (White, 2016, pp. 241-251).

Advantages: àMore efficient use of paths

à no routing decisions are necessary

Disadvantage: àThe network cannot simply reroute if a path has issues.

# A network architecture or communication model places the appropriate network pieces in layers.



## TCP/IP Protocol duties of each layer:

### Application layer:

The TCP/IP model's top layer. The communication protocols between nodes are managed by this layer. Hypertext transfer protocol (HTTP), Secure Shell (SSH), and network time protocol (NTP) are just a few of the protocols in this layer.

Transport layer:  
The TCP/IP model's second layer from the top. This layer oversees data transfer from beginning to end. Transmission control protocol (TCP) and user datagram protocol are two protocols that live on this layer (UDP).

Network layer:  
The TCP/IP model's second layer from the bottom. This layer specifies how protocols are logically transmitted throughout the network. The internet protocol (IP), internet control message protocol (ICMP), and address resolution protocol are the key protocols that live at this layer (ARP).

### Network Access layer:

The bottom layer of the TCP/IP model. This layer establishes how data should be physically sent throughout the network and includes physical devices such as cables and hardware.

Physical layer:  
This layer is responsible for the physical connections of the devices in the network. This layer is implemented using devices such as hubs, repeaters, modem devices, and physical cabling.

## OSI layers functions:

1. Data compression = Presentation layer
2. Multiplexing = Datalink layer
3. Routing = Network layer
4. Definition of a signal’s electrical characteristics = Physical layer
5. Email = Application layer
6. Error detection = Datalink layer
7. End to end flow control = Transport layer

## TCP/IP layers functions:

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