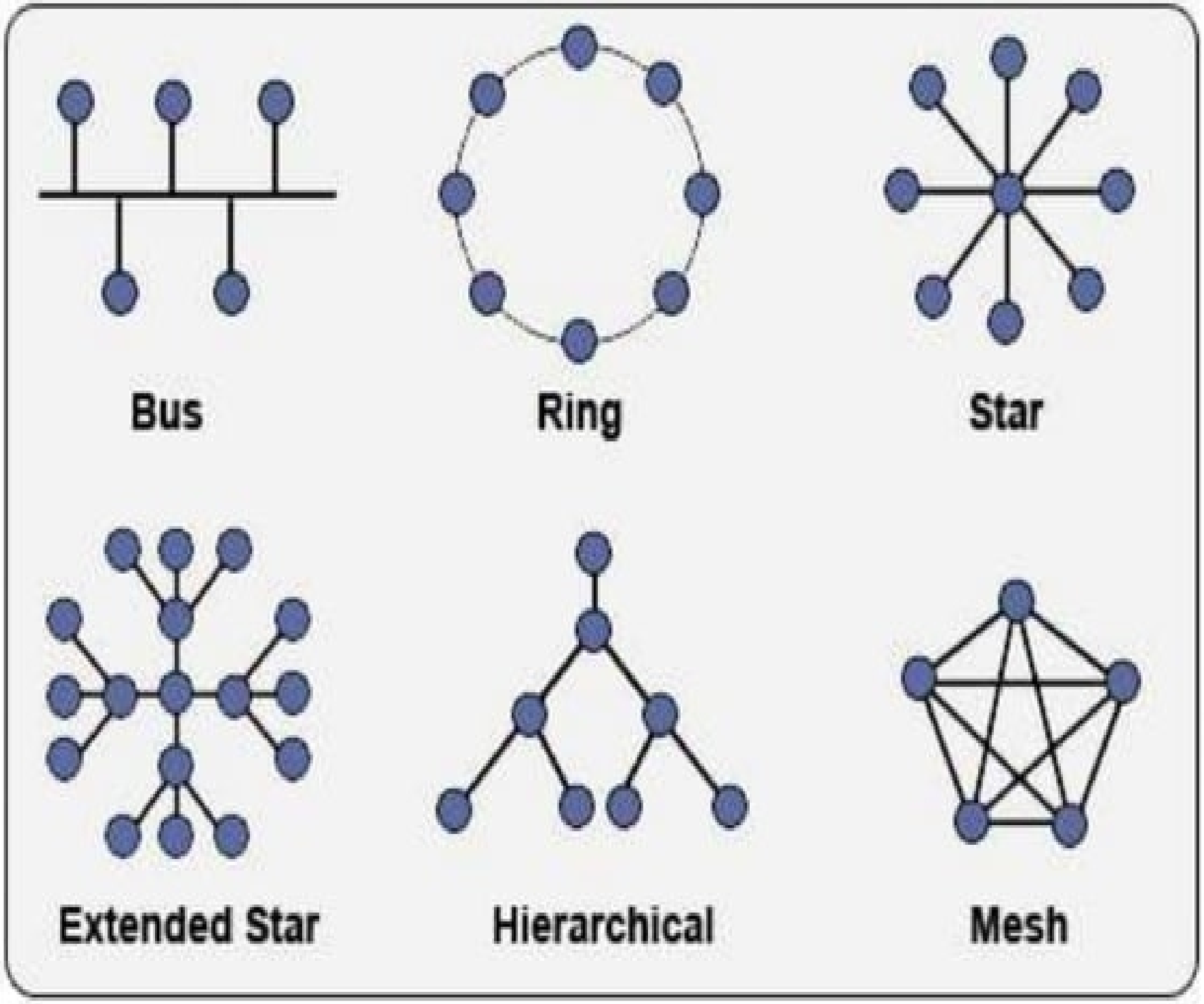
NETWORK TOPOLOGY

Topology

- Topology refers to the layout of connected devices on a network.
- Here, some logical layout of topology.
  - **Mesh**
  - **Star**
  - **Bus**
  - **Ring**
  - **Tree and Hybrid**

Network Topology



Mesh Topology

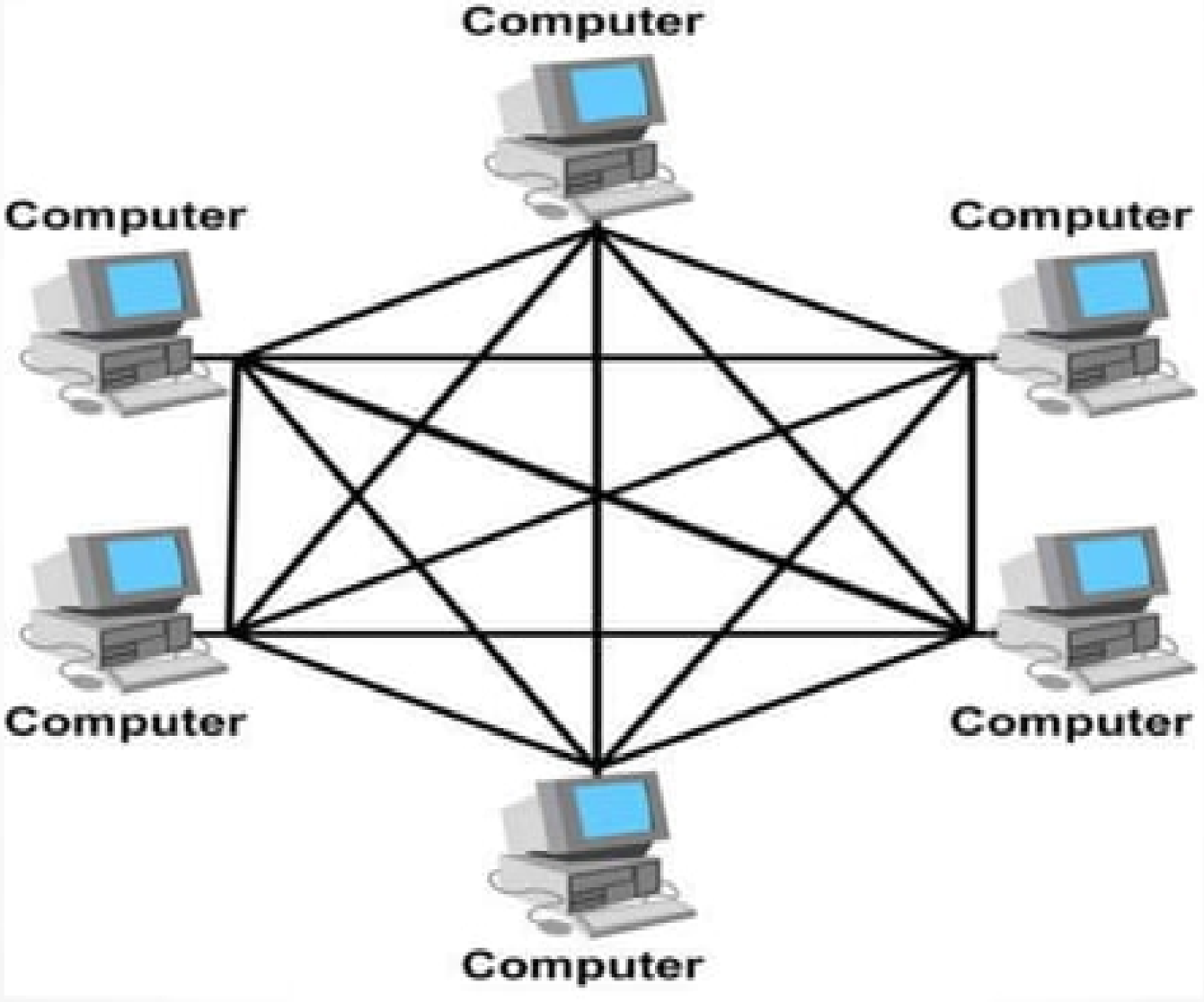
- Here every device has a point to point link to every other device.
- Node 1 node must be connected with n-1 nodes.
- A fully connected mesh can have n(n-1)/2 physical channels to link n devices.
- It must have n-1 I/O ports.

Mesh Topology

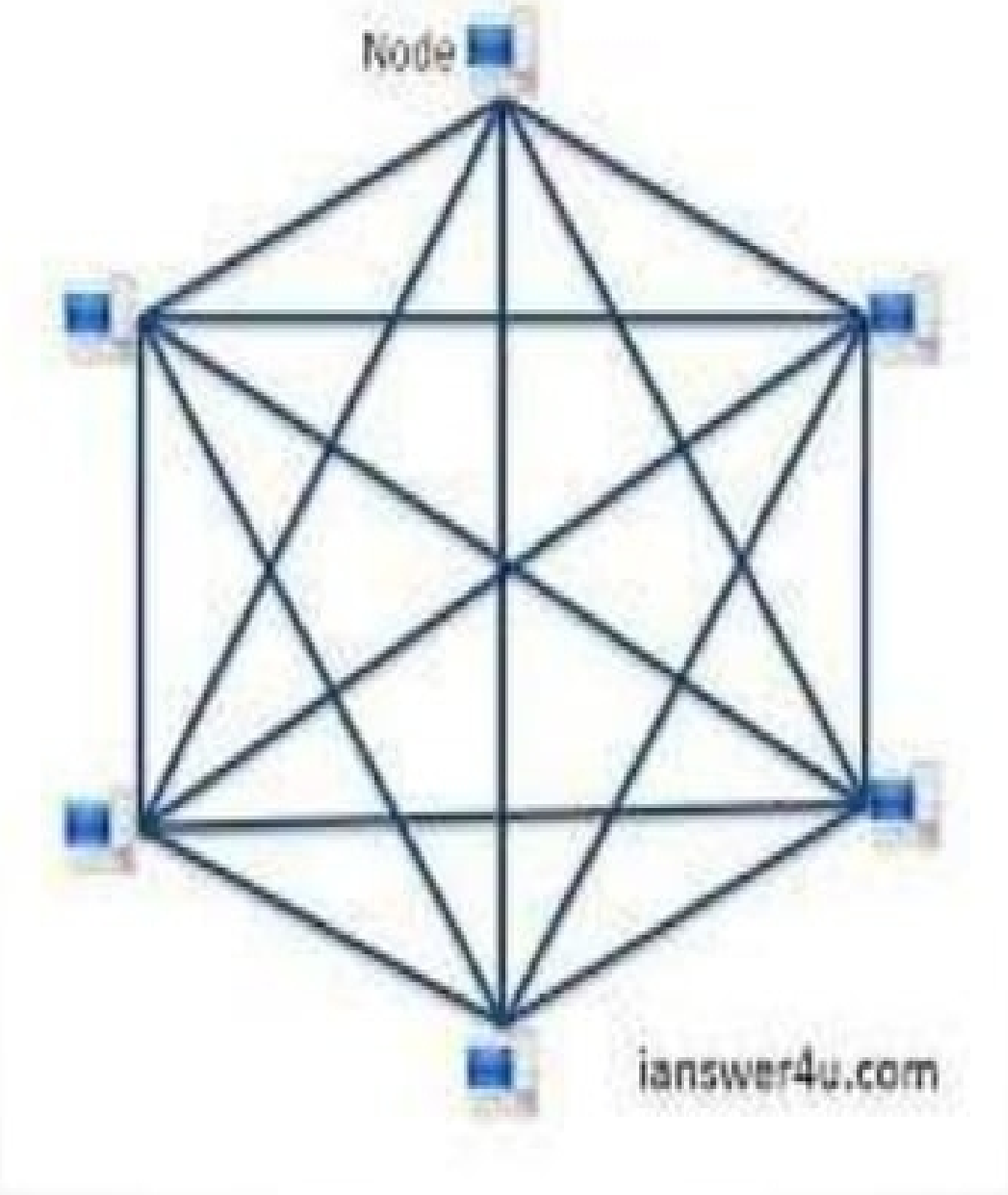
Advantages:

1. They use dedicated links so each link can only carry its own data load. So traffic problem can be avoided.
2. It is robust. If any one link get damaged it cannot affect others.
3. It gives privacy and security.(Message travels along a dedicated link)
4. Fault identification and fault isolation are easy.

Mesh Topology



Mesh Topology



Mesh Topology

- *Disadvantages:*

1. The amount of cabling and the number of I/O ports required are very large. Since every device is connected to each devices through dedicated links.
2. The sheer bulk of wiring is larger then the available space.
3. Hardware required to connected each device is highly expensive.

Mesh Topology

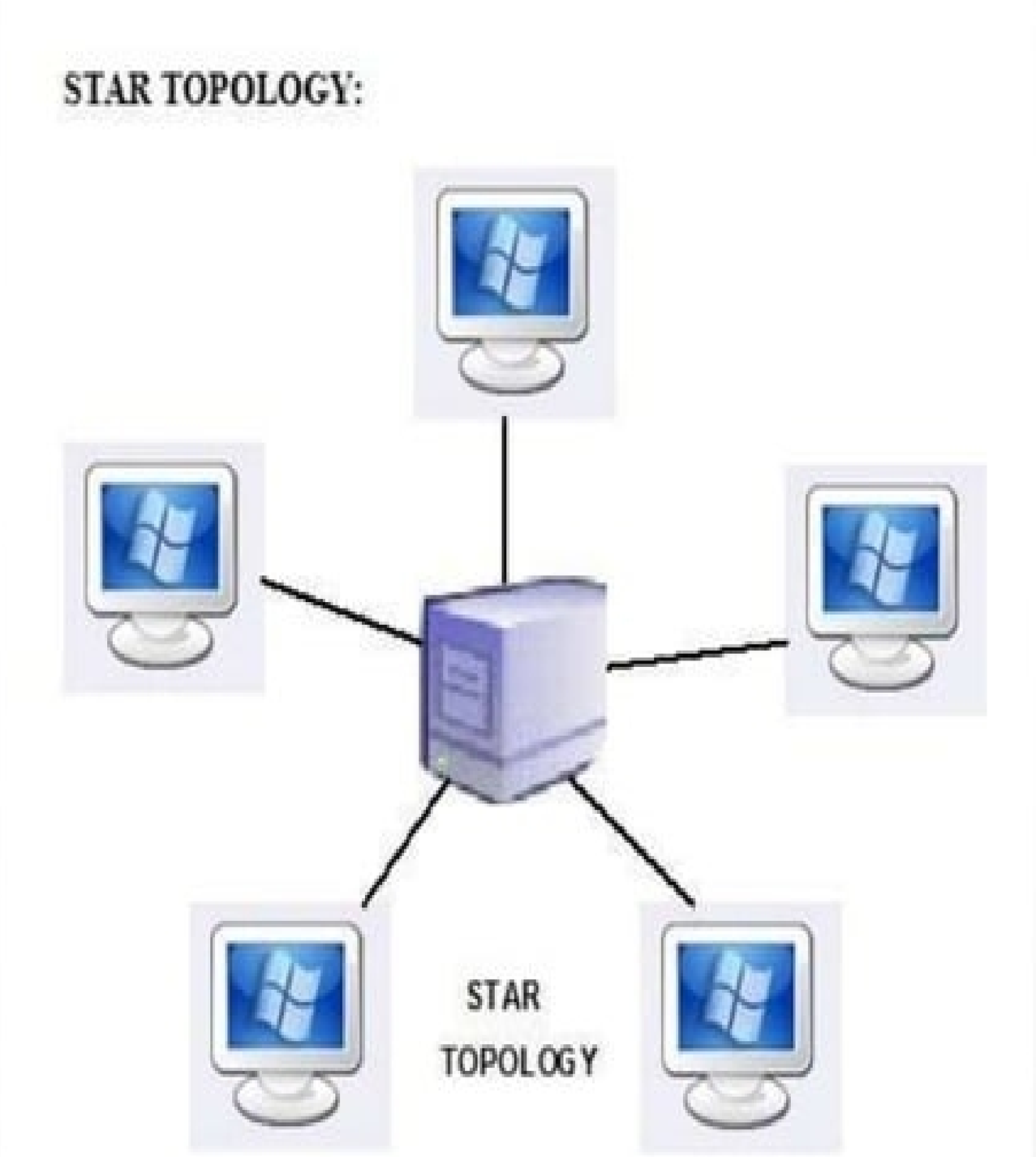
- *Applications:*

1. Telephone Regional office.
2. WAN.(Wide Area Network).

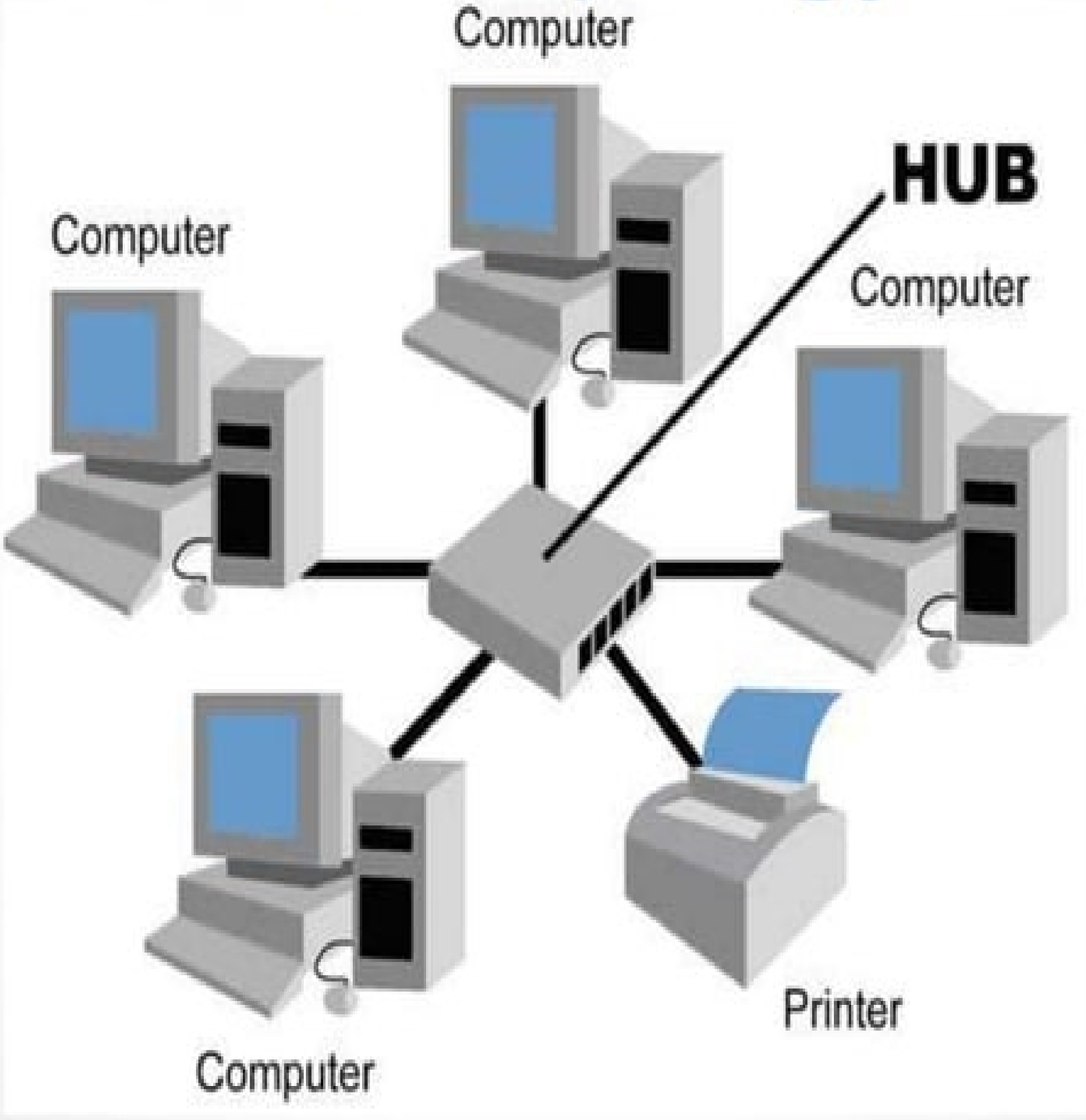
Star Topology

- Here each device has a dedicated point-to-point link to the central controller called "Hub"(Act as a Exchange).
- There is no direct traffic between devices.
- The transmission are occurred only through the central "hub".
- When device 1 wants to send data to device 2; First sends the data to hub. Which then relays the data to the other connected device.

Star Topology



Star Topology



Star Topology

- *Advantages:*

1. Less expensive then mesh since each device is connected only to the hub.
2. Installation and configuration are easy.
3. Less cabling is need then mesh.
4. Robustness.(if one link fails, only that links is affected. All other links remain active)
5. Easy to fault identification & to remove parts.
6. No distruptions to the network then connecting(or) removing devices.

Star Topology

- *Disadvantages:*

1. Even it requires less cabling then mesh when compared with other topologies it still large.(Ring or bus).
2. Dependency(whole n/w dependent on one single point(hub). When it goes down. The whole system is dead.

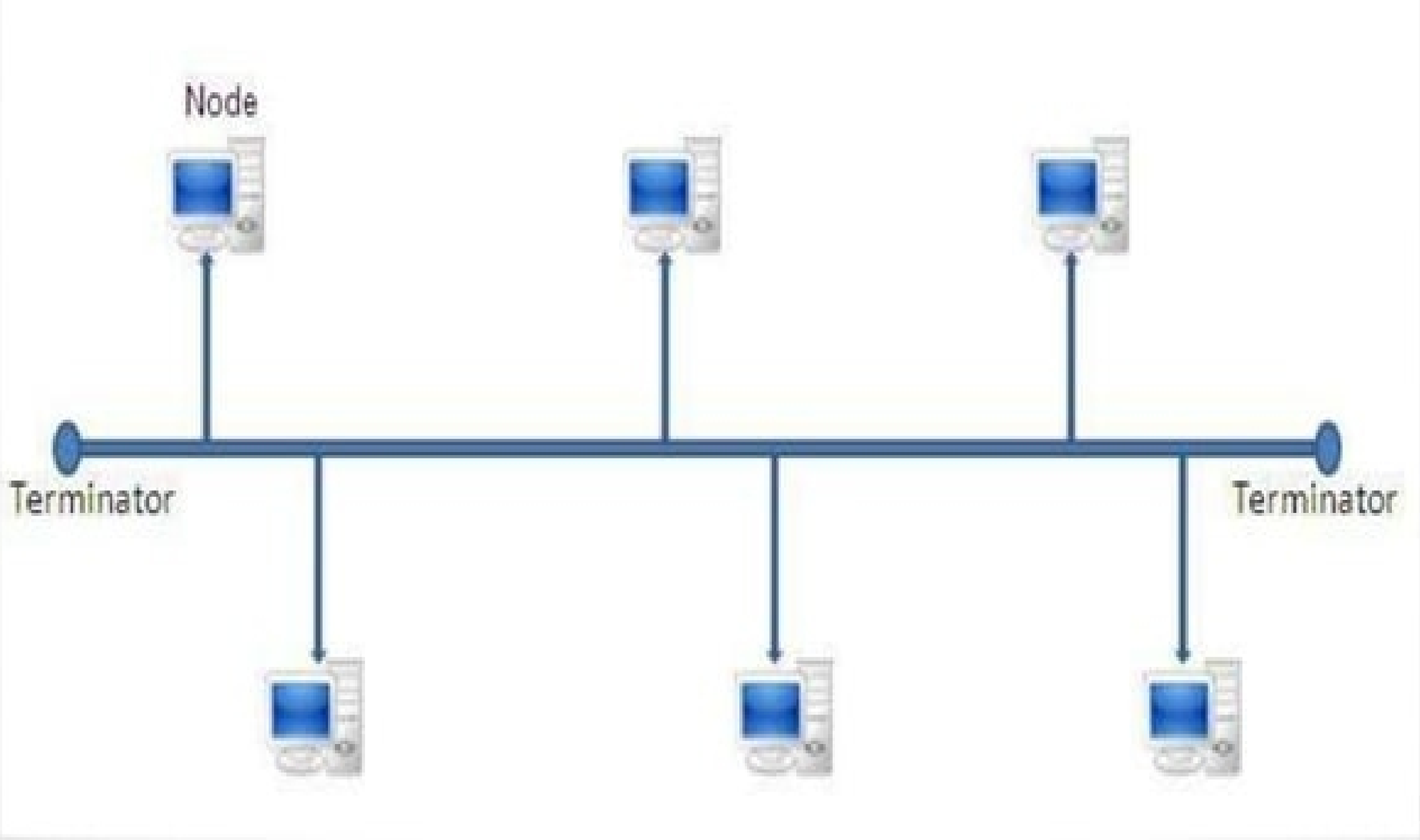
Applications

- Star topology used in Local Area Networks(LANs).
- High speed LAN often used STAR.

Bus Topology

- A bus topology is multipoint.
- Here one long cable act as a backbone to link all the devices are connected to the backbone by drop lines and taps.
- Drop line- is the connection b/w the devices and the cable.
- Tap- is the splitter that cut the main link.
- This allows only one device to transmit at a time.

Bus Topology



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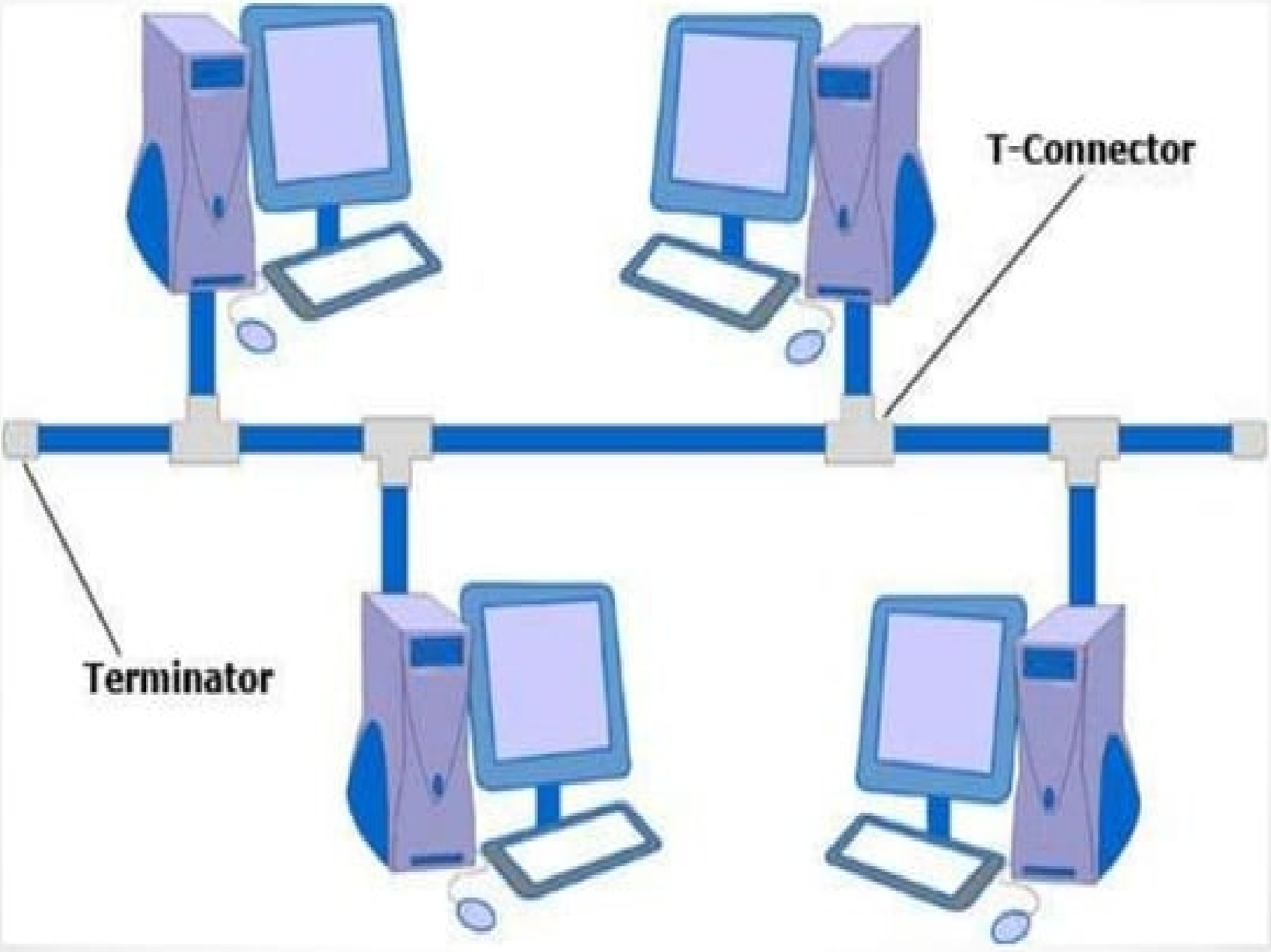

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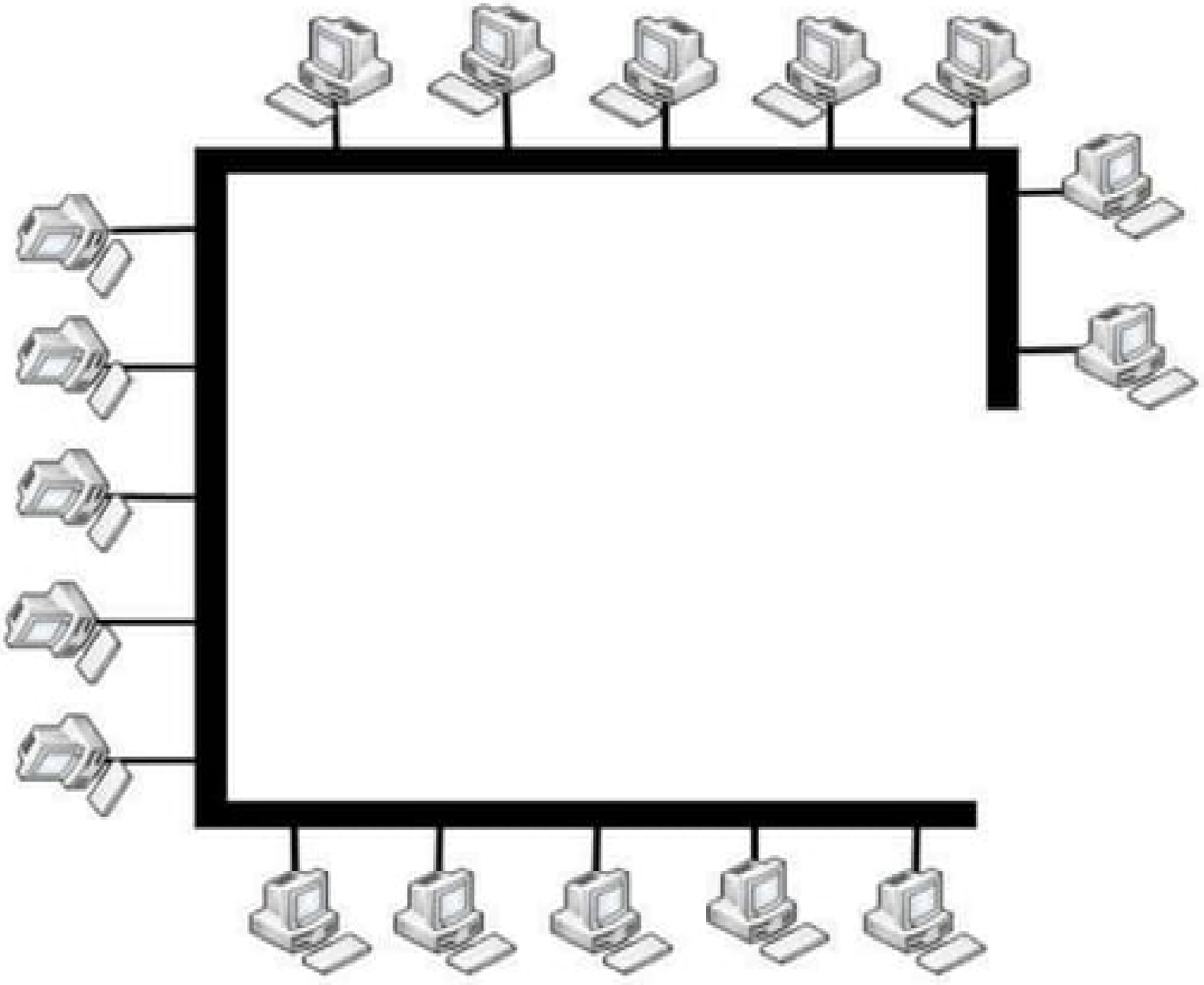
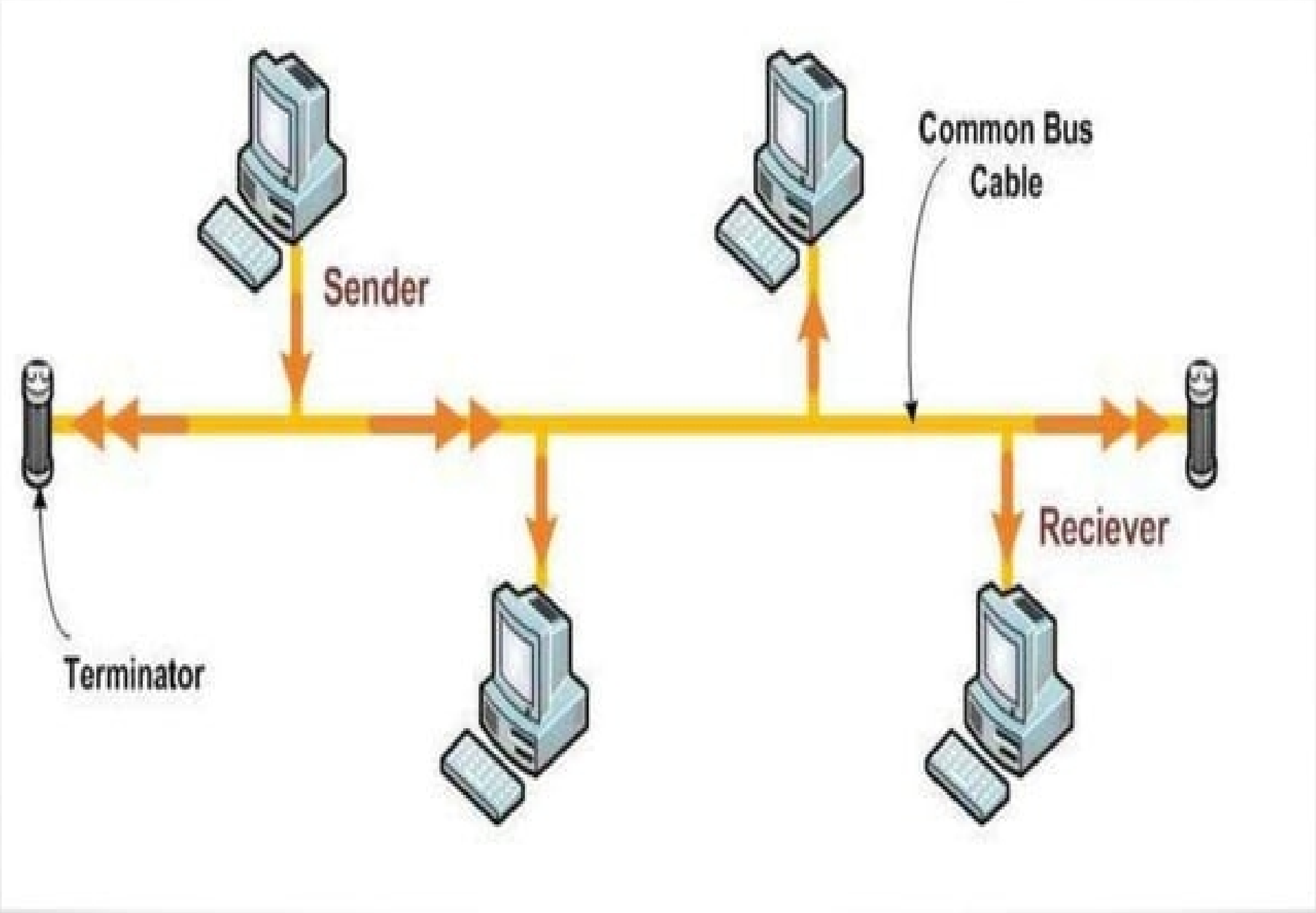


Bus Topology



Bus Topology

- A device want to communicate with other device on the n/ws sends a broadcast message onto the wire all other devices see.
- But only the intended devices accepts and process the message.

Bus Topology

- *Advantages:*

1. Ease of installation
2. Less cabling

Disadvantages:

1. Difficult reconfiguration and fault isolation.
2. Difficult to add new devices.
3. Signal reflection at top can degradation in quality.
4. If any fault in backbone can stops all transmission.

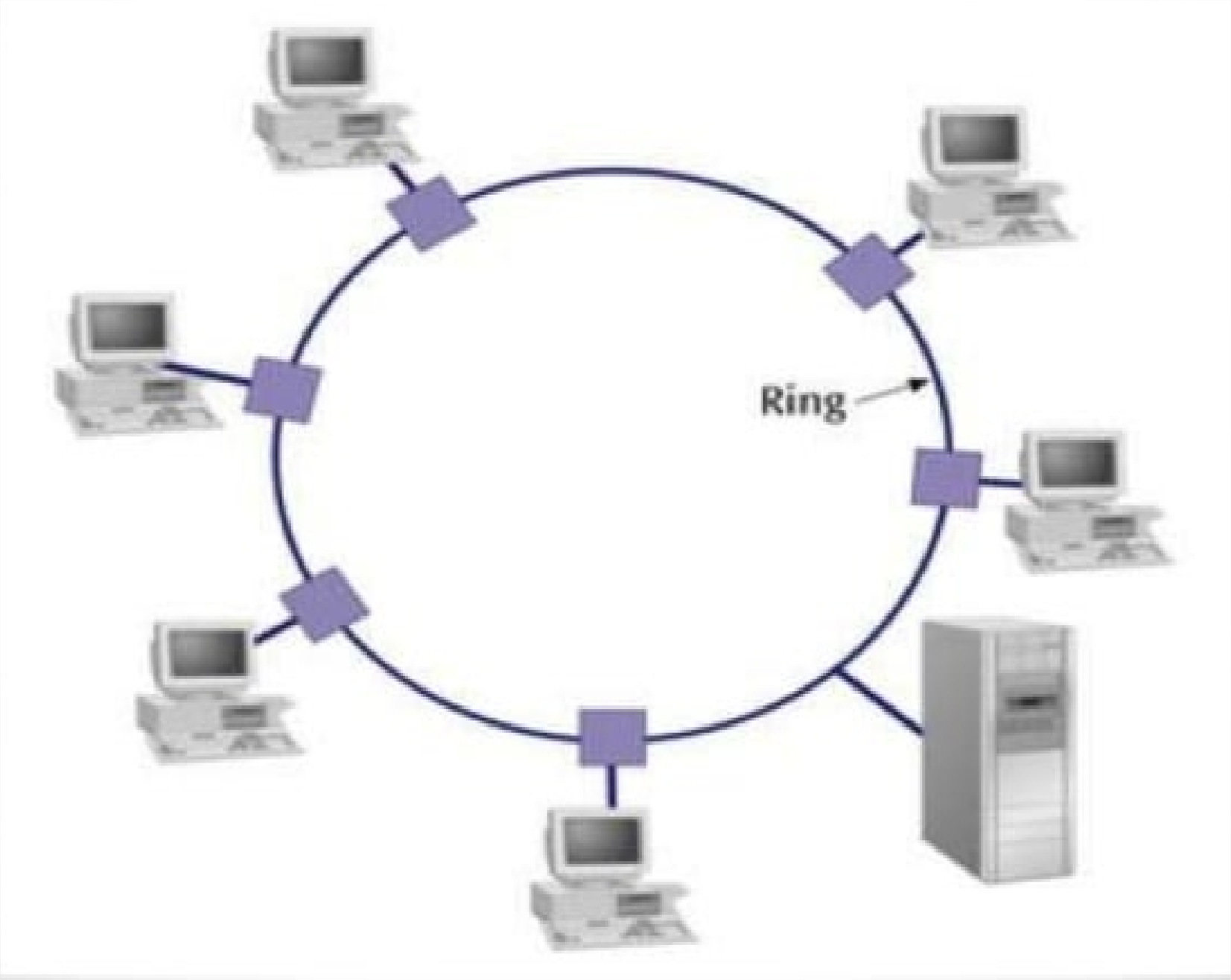
Bus Topology

- *Applications:*
- Most computer motherboard.

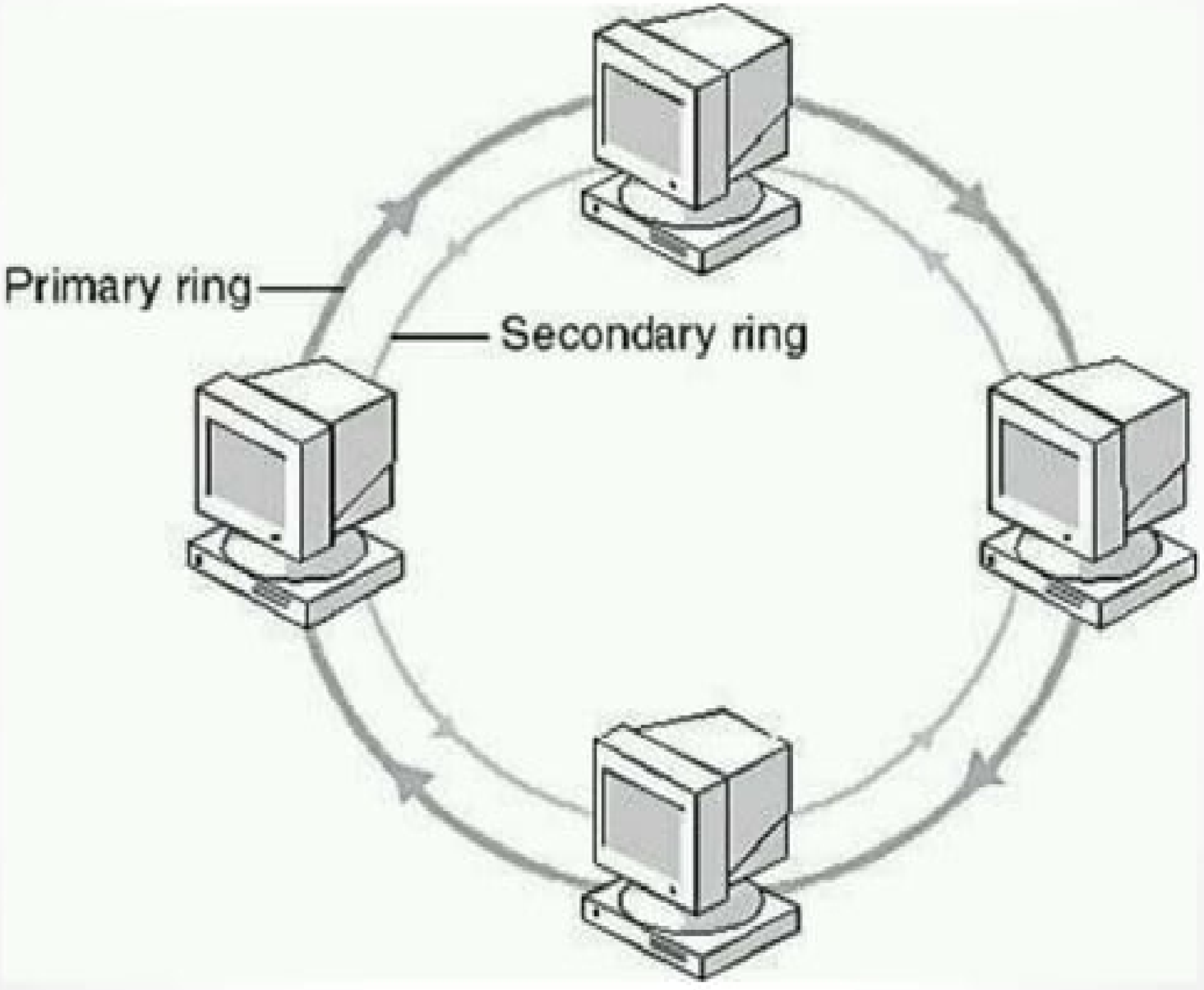
Ring Topology

- Here each device has a dedicated connection with two devices on either side.
- The signal is passed in one direction from device to device until it reaches the destination and each device have repeater.
- When one device received signals instead of intended another device, its repeater then regenerates the data and passes them along.
- To add or delete a device requires changing only two connections.

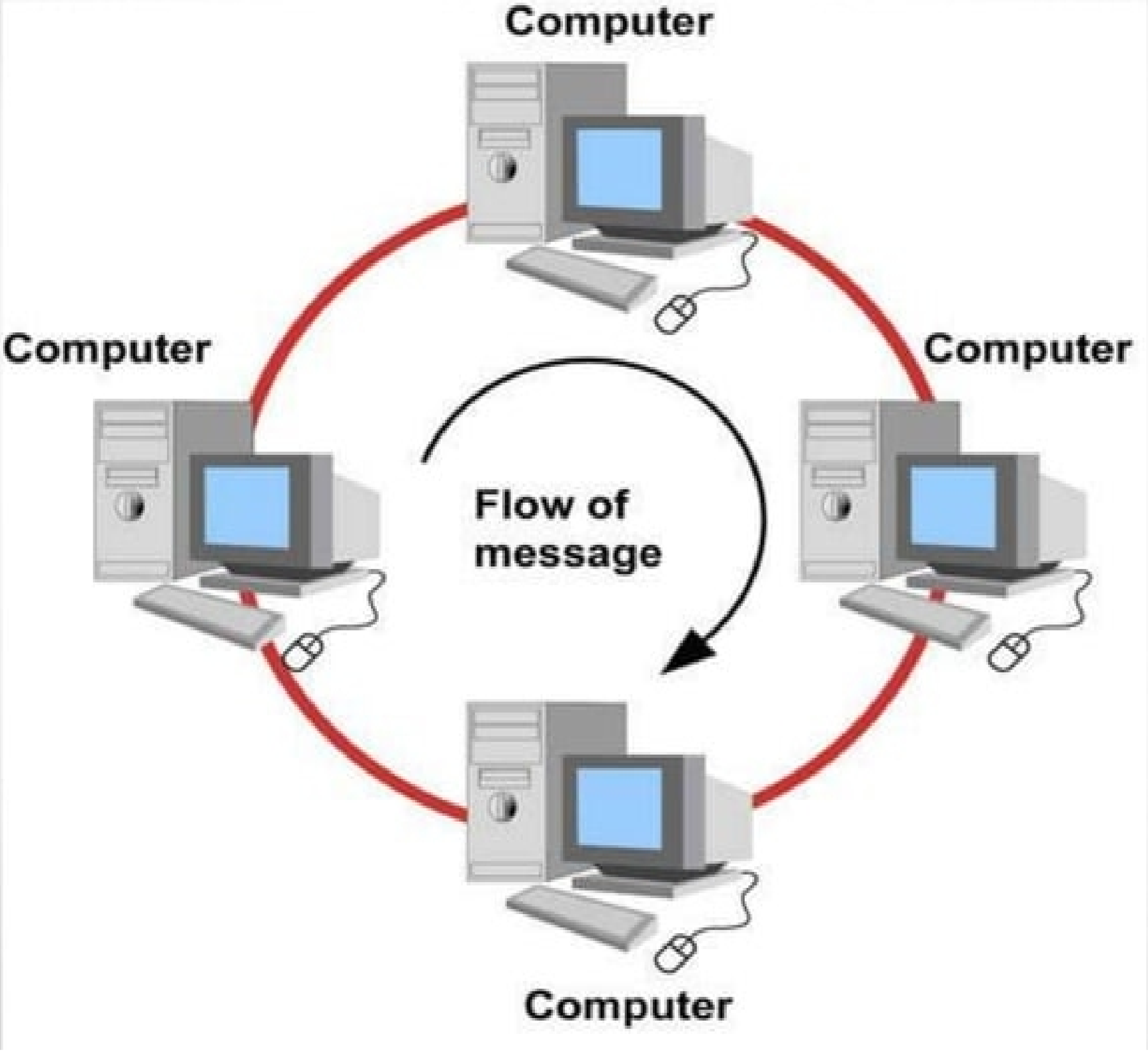
Ring Topology



Ring Topology



Ring Topology



Ring Topology

- *Advantages:*

1. Easy to install.
2. Easy to reconfigure.
3. Fault identification is easy.

Disadvantages:

1. Unidirectional traffic.
2. Break in a single ring can break entire network.

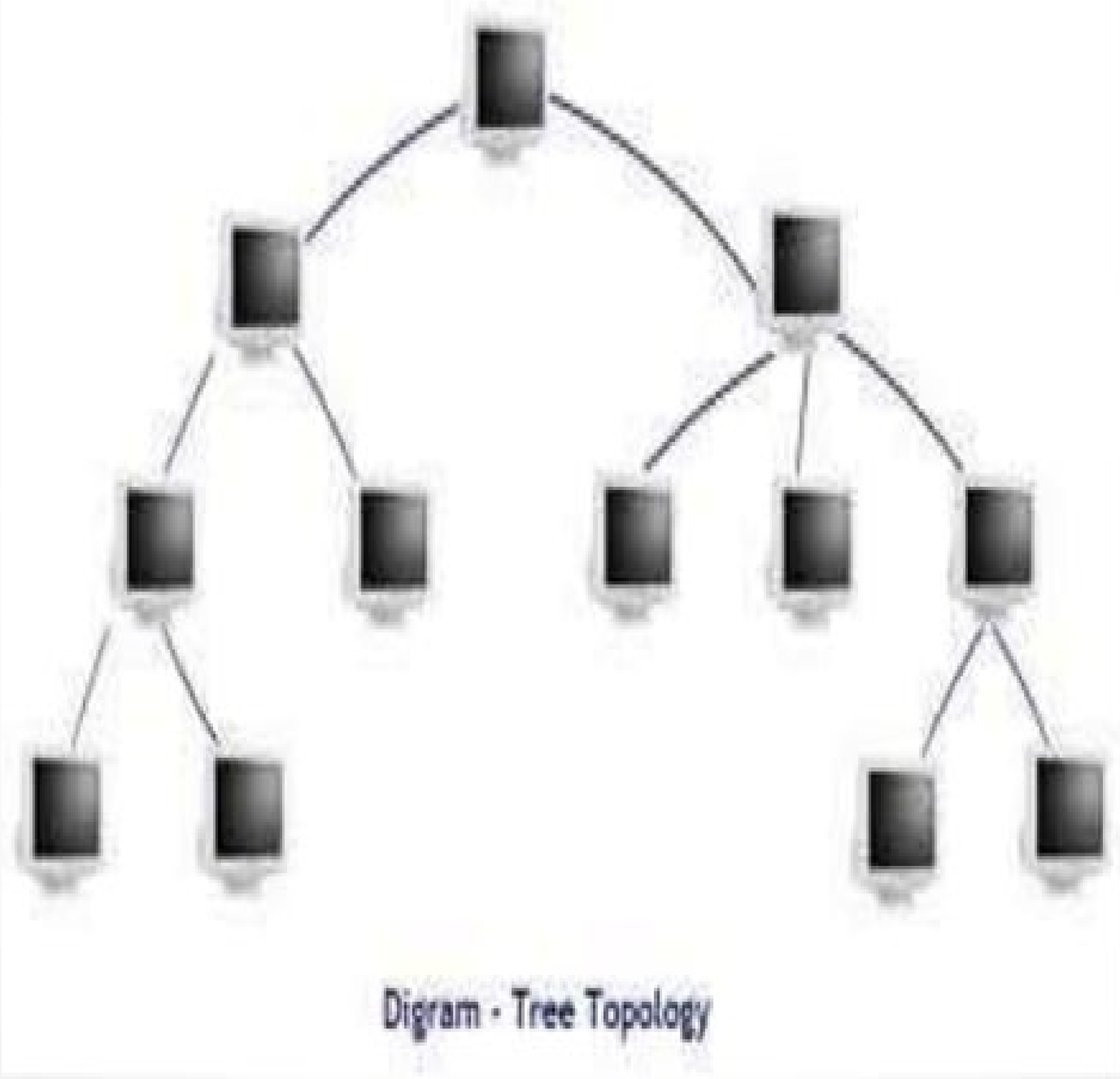
Ring Topology

- *Applications:*
- Ring topologies are found in some office buildings or school campuses.
- Today high speed LANs made this topology less popular.

Tree Topology

- Alternatively referred to as a star bus topology.
- Tree topology is one of the most common network setups that is similar to a bus topology and a star topology.
- A tree topology connects multiple star networks to other star networks. Below is a visual example of a simple computer setup on a network using the star topology.

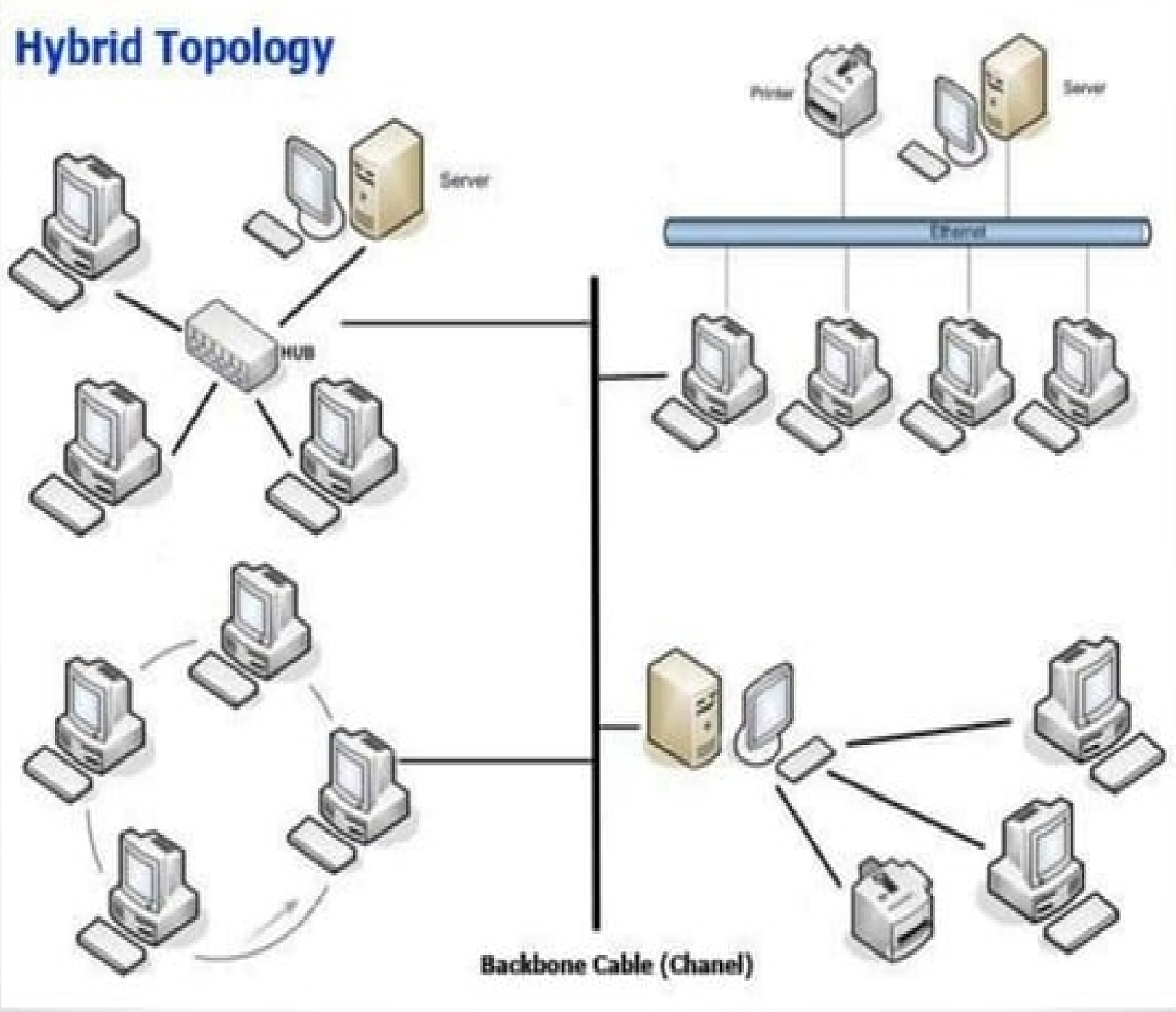
Tree Topology



Hybrid Topology

- A network which contain all type of physical structure and connected under a single backbone channel.

Hybrid Topology



Considerations for choosing topology

- Money-Bus n/w may be the least expensive way to install a n/w.
- Length-of cable needed- the linear bus n/w uses shorter lengths of cable.
- Future growth-with star topology, expending a n/w is easily done by adding another devices.
- Cable type-most common used cable in commercial organization is twisted pair. Which often used with star topologies.

- Full mesh topology is theoretically the best since every device is connected to every other device.(thus maximizing speed and security. however, it quite expensive to install)
- Next best would be tree topology, which is basically a connection of star.

COMPUTER ETHICS

By

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C.K.Jaganathan S.Jishnu

INTRODUCTION

- Ethics is a set of moral principles that govern the behavior of a group or individual.
- likewise, computer ethics is set of moral principles that regulate the use of computers.

Common issues of computer ethics

Some common issues of computer ethics include intellectual property rights such as copyrighted electronic content, privacy concerns, and how computers affect society.

Contd....

For example, while it is easy to duplicate copyrighted electronic or digital content, computer ethics would suggest that it is wrong to do so without the author's approval.

And while it may be possible to access someone's personal information on a computer system, computer ethics would advise that such an action is unethical.

INTELLECTUAL

You have certainly heard the word property before: it is generally used to mean a possession, or more specifically, something to which the owner has legal rights.

You might have also encountered the phrase intellectual property. This term has become more commonplace during the past few years, especially in the context of computer ethics. But what exactly does it refer to?

Contd…

Intellectual property refers to creations of the intellect (hence, the name): inventions, literary and artistic works, symbols, names, images, and designs used in commerce are a part of it.

Intellectual property is usually divided into two branches, namely *industrial property* which broadly speaking protects inventions and *copyright*, which protects literary and artistic works.

CATEGORISING INTELLECTUAL PROPERY

- Intellectual property is divided into two categories:
- *Industrial property*, which includes inventions (patents), trademarks, industrial designs, commercial names, designations and geographic indications (location specific brands) etc.
- *Copyright*, which includes literary and artistic works such as novels, poems and plays, films, musical works, artistic works such as drawings, paintings, photographs, sculptures, and architectural designs.

Copy rights

Copyright is a legal concept, enacted by most governments, giving the creator of an original work exclusive rights to it, usually for a limited time.

History of copy right

Copyright came about with the invention of the printing press and with wider public literacy. As a legal concept, its origins in Britain were from a reaction to printers' monopolies at the beginning of the 18th century. Charles II of England was concerned by the unregulated copying of books and passed the Licensing of the Press Act 1662 by Act of Parliament.

WHAT IT CAN PROTECT AND WHAT NOT

In summary, copyright laws protect intellectual property which includes literary and artistic works such as novels, poems and plays, films, musical works, artistic works such as drawings, paintings, photographs and sculptures, and architectural designs.

But unlike protection of inventions, copyright law protects only the form of expressions of ideas, not the ideas themselves.

Remember that a created work is considered protected as soon as it exists, and a public register of copyright protected work is not necessary.

COPY RIGHT ON INTERNET

- But what of works made available to the public on the Internet? Are they at all protected by copyright? Once again, yes! For works made available over a communications network (such as the Internet), the copyright protects original authorship.
- But, according to the Copyright Law, it does not protect ideas, procedures, systems, or methods of operation. This means that once such an online work has been made public, nothing in the copyright laws prevents others from developing another work based on similar principles, or ideas.

NETIQUTTES

Netiquette are about the the various risks related to using the Internet.

It is about proper ways in which to use a network and to determine whether information is reliable, while emphasizing four important points given in next slides.

REAL PEPOLE EXIST BEHIND THE COMPUTERS

You are dealing with people, not machines. So think twice before you click on Send button in the mail/chat window

You are not the only one using the network

Keep these other people in mind when you say something on a network.

PROTECT YOUR PRIVACY

- Just as you would in the real world, be aware of risks, fraud and false information which exists on the Internet. Use common sense when deciding whether information is valid. Don't trust or spread further any information about which you are in doubt. Always try to obtain reliable information.
- Protect your personal information to keep someone from using it in an unethical way. (For example, when you enter a prize contest, your name, address, and phone number may be given to a dealer of personal information.)

AVOID SPAMMING

- Spamming is sending unsolicited bulk and/or commercial messages over the Internet.
- Spamming is morally bad if it is intended to destroy and done by infringing on the right of privacy of others.
- It could be good if the message sent benefits the recipients, like giving out warnings or useful information to others.

HELP MAKING NETWORK BETTER

The existence of the information society is based on give and take. Making a contribution is an essential part of being a good network user. For example, if you make a request and find the information you receive helpful, write a summary and report what you learned , publish it on the Net or give links to others.

SOFTWARE PRIVACY

- Software piracy is morally bad when someone reproduces a copy of the software and sells it for profit, produces exactly the same or similar version without giving proper credit to the original author, or simply produces it and distributes it to others.
- It is not immoral to copy the software if someone who has a licensed copy of the software and simply makes a backup copy of the original. One back-up copy of the commercial software can be made, but the back-up copy cannot be used except when the original package fails or is destroyed.

CREATION OF WORMS AND COMPUTER VIRUS

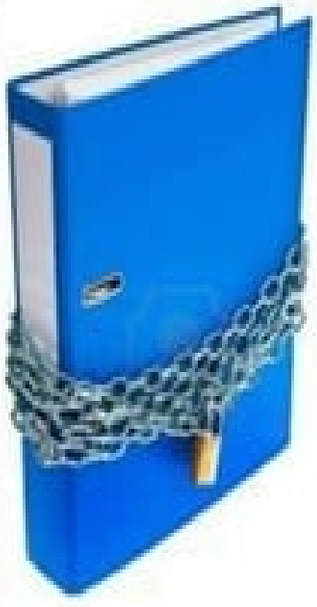
- Creation of worms and computer viruses is morally bad when it is intended for malicious purposes like to steal information or destroying of data.
- However, it could be used like a vaccine – poison to kill another poison – to cure or prevent a potentially destructive system from wreaking havoc in the network. The way some worms and viruses work could be used to gather information that could help protect the majority of computer users.

PLAGIARISM

- Plagiarism is copying someone else's work and then passing it off as one's own. It is morally bad because it is an act of stealing.
- Copying programs written by other programmers and claiming it as your own could be an act of plagiarism. It involves lying, cheating, theft, and dishonesty.

FILE PRIVACY

Any computer document produced either by an individual in his private home or in his office should remain private. No one has should open any document unless authorized by the individual who created the file himself.



Computer ethical hacking

An ethical hacker is usually employed by an organization who trusts him or her to attempt to penetrate networks and/or computer systems, using the same methods as a hacker, for the purpose of finding and fixing computer security vulnerabilities. Unauthorized hacking (i.e., gaining access to computer systems without prior authorization from the owner) is a crime in most countries, but penetration testing done by request of the owner of the victim system or network is not.

Contd..

A Certified Ethical Hacker has obtained a certification in how to look for the weaknesses and vulnerabilities in target systems and uses the same knowledge and tools as a hacker.

CONCLUSION

As technology advances, computers continue to have a greater impact on society. Therefore, computer ethics promotes the discussion of how much influence computers should have in areas such as artificial intelligence and human communication. As the world of computers evolves, computer ethics continues to create ethical standards that address new issues raised by new technologies.