iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 4 **Issue:** XI **Month of publication:** November 2016

DOI:

www.ijraset.com

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Volume 4 Issue XI, November 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Computer networks Considerations When Choosing a Topology

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***Abstract*—.Instantly sending messages across the world has represented something new and extraordinary in the world of computer networks. Instant messaging saw the increase in usage of 'text language' and emoticons which served as a replacement for people's facial expressions and body language. Internet instant messaging has allowed people to continue real time communication anytime they wish, and they are also able to edit their conversations simply by hitting the backspace button. This is something that cannot happen in real life conversations.The majority of communications that occur over the Internet, except video calling, are text based, and therefore lack certain aspects of human communication such as facial expressions and body language. The fact that we can remain anonymous over the Internet has caused some people to blame the Internet for a rise in anti social behavior.**

***Keywords*— WLAN, CSMACA, WSN, MAC , FDDI**

I. INTRODUCTION

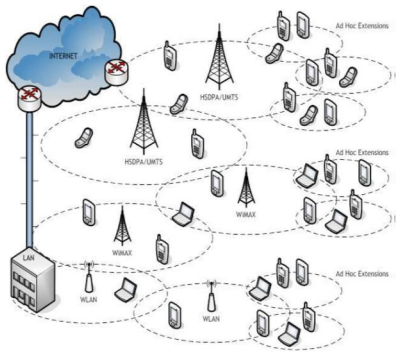
Computers in a network have to be connected in some logical manner. The layout pattern of the interconnections between computers in a network is called network topology. You can think of topology as the virtual shape or structure of the network. Network topology is also referred to as 'network architecture'. A network is a set of devices (often referred to as nodes) connected by communication links. A node can be a computer, printer, or any other device capable of sending and receiving data generated by other nodes on the network.

A. Network media

With computer networks, media refers to the means used to link a network's nodes together. There are many different types of transmission media, the most popular being twisted-pair wire, coaxial cable, and the fiber optic cable.

With the development of network and communication technology, the inconvenience of wiring is solved with WSN into people's life; especially it has wide perspective and practicability in the area of remote sensing, industrial automation control, and domestic appliance and so on. WSN has good functions of data collection, transmission, and processing. It has many advantages compared to traditional wired network, for example, convenient organizing network, small influence to environment, low power dissipation, low cost, etc. At present, near field wireless communication technology has been used widely, especially Bluetooth, wireless local area network (WLAN), infrared, etc. But, they have a number of disadvantages, for example, complexity, large power dissipation, short distance, networking in small scale. In order to satisfy the demand of low power dissipation and low speed among wireless communication devices, a new type of wireless net technology-Zigbee emerges as the times require.

It also obtains self-recovery function that the network can repair itself when a node is added or deleted, the position of a node is changed, or a breakdown occurred. It also can adjust the topology structure to ensure that the whole system can work normally without any human interventions.



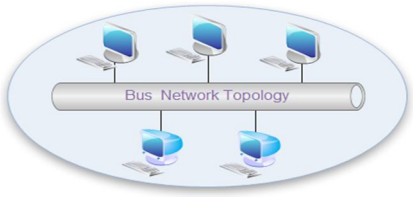
More complex networks can be built as hybrids of two or more of the above basic topologies.

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B. Bus Topology

Bus networks (not to be confused with the system bus of a computer) use a common backbone to connect all devices. A single cable, the backbone functions as a shared communication medium that devices attach or tap into with an interface connector. A device wanting to communicate with another device on the network sends a broadcast message onto the wire that all other devices see, but only the intended recipient actually accepts and processes the message.



C. Star Topology

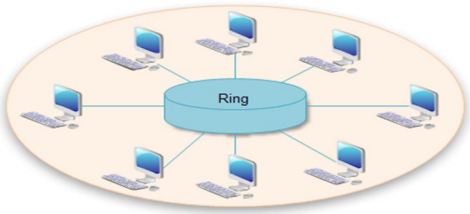
Many home networks use the star topology. A star network features a central connection point called a "hub" that may be a hub, switch or router. Devices typically connect to the hub with Unshielded Twisted Pair (UTP) Ethernet.

Compared to the bus topology, a star network generally requires more cable, but a failure in any star network cable will only take down one computer's network access and not the entire LAN. (If the hub fails, however, the entire network also fails.)

D. Ring Topology

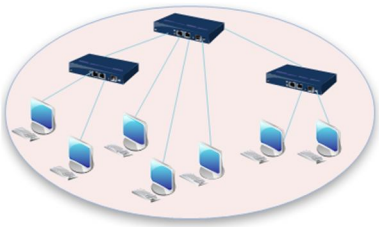
In a ring network, every device has exactly two neighbors for communication purposes. All messages travel through a ring in the same direction (either "clockwise" or "counterclockwise"). A failure in any cable or device breaks the loop and can take down the entire network.

To implement a ring network, one typically uses FDDI, SONET, or Token Ring technology. Ring topologies are found in some office buildings or school campuses.



E. Tree Topology

Tree topologies integrate multiple star topologies together onto a bus. In its simplest form, only hub devices connect directly to the tree bus, and each hub functions as the "root" of a tree of devices.



F. MESh Topology

Mesh topologies involve the concept of routes. Unlike each of the previous topologies, messages sent on a mesh network can take any of several possible paths from source to destination. (Recall that even in a ring, although two cable paths exist, messages can only travel in one direction.) Some WANs, most notably the Internet, employ mesh routing.

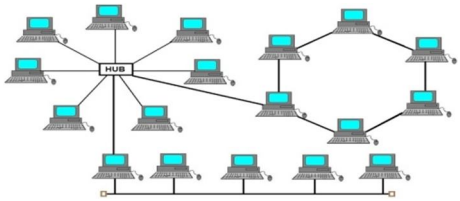
A mesh network in which every device connects to every other is called a full mesh. As shown in the illustration below, partial mesh networks also exist in which some devices connect only indirectly to others.

G. Hybrid Topology

A combination of any two or more network topologies. Instances can occur where two basic network topologies, when connected

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together, can still retain the basic network character, and therefore not be a hybrid network. For example, a tree network connected to a tree network is still a tree network. Therefore, a hybrid network accrues only when two basic networks are connected and the resulting network topology fails to meet one of the basic topology definitions. For example, two star networks connected together exhibit hybrid network topologies. A hybrid topology always accrues when two different basic network topologies are connected



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H. Considerations When Choosing a Topology

Selecting an appropriate topology for your deployment environment depends upon several factors.When you select a topology pattern, consider the following factors:

1) Available hardware resources
2) Application invocation patterns
3) Types of business processes that you plan to implement (interruptible versus non-interruptible)
4) How heavily you intend to use the Common Event Infrastructure (CEI)
5) Individual scalability requirements
6) Administrative effort involved

The IBM-supplied topologies can be applied to both Process Server and Process Center topologies. Therefore, your Process Center and Process Server network deployment environments can be organized in a similar way.

The procedures for creating environments for Process Server and Process Center based on IBM-supplied topologies are also similar. The only difference related to IBM-supplied patterns is the recommended patterns for a production environment, and the components configured on the clusters for those patterns.

For information on the components, features and functionality available in each of the IBM® Business Process

Follow these tips regarding IBM-supplied topologies.

7) For an IBM Process Server deployment environment, these topologies work best

a) Remote Messaging, Remote Support, and Web - Four-cluster topology pattern

Note: Do not use this pattern for a Standard configuration unless it includes IBM Business Monitor.

b) Remote Messaging and Remote Support - Three-cluster topology pattern

I. For an IBM Process Center deployment environment, these topologies work best

a) Single Cluster topology pattern
b) Remote Messaging - Two-cluster topology pattern

The pattern that you choose for your Process Server or Process Center network deployment environment must be based upon your unique requirements.

Money. A linear bus network may be the least expensive way to install a network; you do not have to purchase concentrators.

Length of cable needed. The linear bus network uses shorter lengths of cable.

Future growth. With a star topology, expanding a network is easily done by adding another concentrator.

Cable type. The most common cable in schools is unshielded twisted pair, which is most often used with star topologies.

II. CONCLUSIONS

Computer networks have had a profound effect on the way that we communicate with each other. The first computer network was invented to allow for a distributed communications network that lets a person do automatic rerouting. The original job of this type of system was to allow government researchers and military leaders to continue monitoring the possibility of danger from the enemy. Below are some effects that computer networks have had on communications.

Some people believe that the Internet and email have pejorated the English language and the way that we communicate as people

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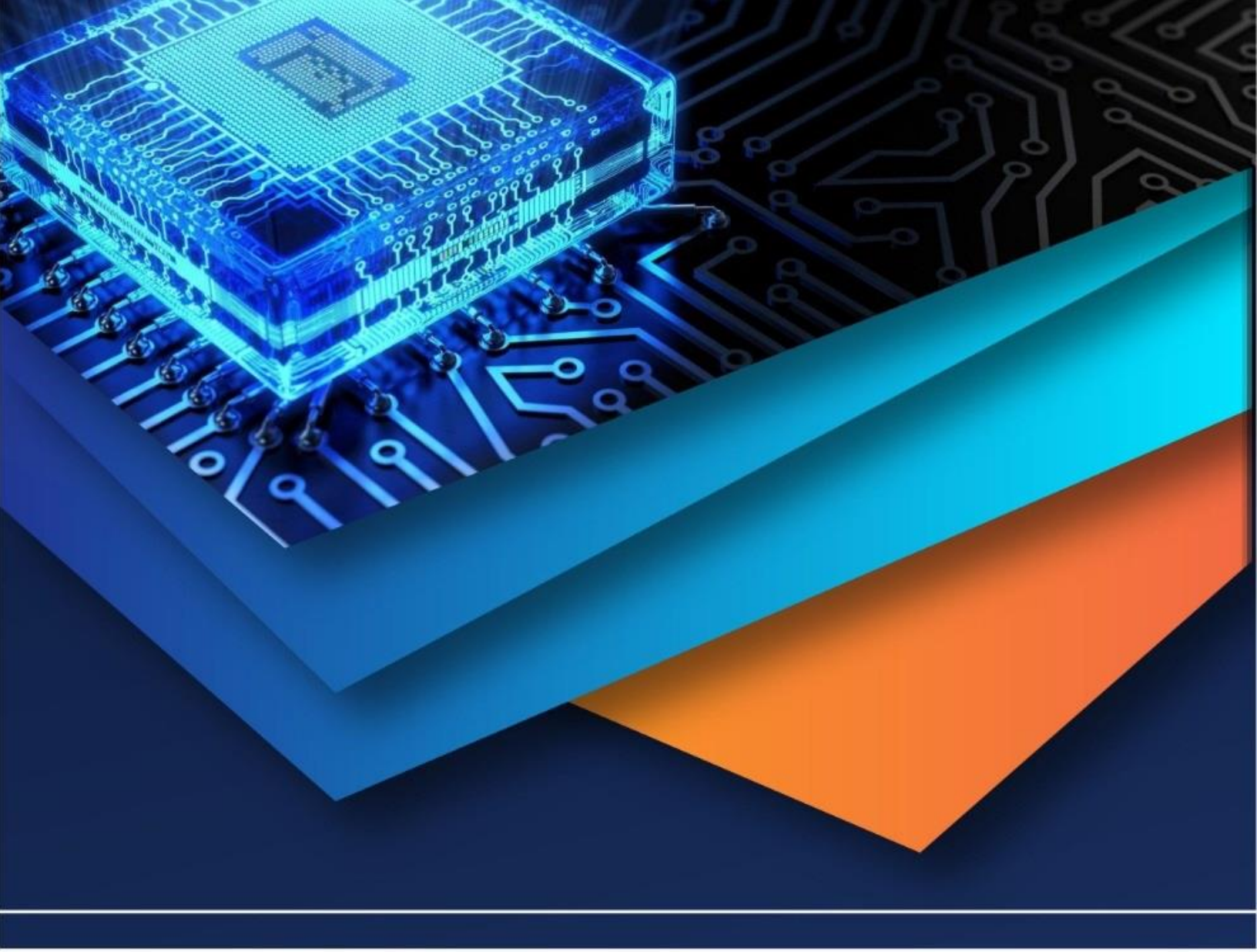
because it has become so impersonal. However, others believe that it has caused the way that we communicate to become more broad, and that it has done more good than bad. One argument for computer networking is that it has caused the art of letter writing to be reborn because it now takes us less time to write it.

The art of writing letters has resulted in more spontaneous letters being sent because it takes almost less than a second for information to travel across the world.

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