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Assignment-01

* Title:- To setup a wired LAN using layer 2 switch & then IP switch of minimum four computers

* Problem Statement:
A). Setup a wired LAN using layer 2 switch & then I.P switch of minimum of four computers. It includes preparation of cable, testing of cable using line tester, configuration machine using IP address, testing using PING utility & demonstration of PING packets captured traces using wireshark packet Analyser.

B). Fixed the some assignment for wireless using access point.

* Software Requirements:
Windows 10 OS, intel i5 processor, cisco packet Tracer, Wireshark tool.

* Theory:-
Types of LAN:
A local area Network (LAN) is a computer netwo that interconnects computers within a limited area such as a residence, school, laboratory, university campus or office building and has its network equipment & interconnects locally managed.

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Ethernet & wi-fi are the 2 most common transmission technologies in use.

- Ethernet LAN:
  Ethernet is the most popular physical layer LAN technology in use today. It defines the number of conductors that are required for a connection. A standard ethernet network can transmit data at a rate upto 10 megabits per second (10 Mbps). Other LAN types include Token Ring, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, Fiber Distributed Data Interface (FDDI).

- Fast Ethernet:
  The fast Ethernet (standard IEEE 802.3u) has been established for Ethernet networks that need higher transmission speeds. This standard raises the Ethernet speed limit from 10 Mbps to 100 Mbps with only minimal changes to the existing cable structure.

- gigabit ethernet:
  It was developed to meet the need for faster communication networks with applications such as multimedia & voice over IP (VoIP). It is defined in the IEEE 802.3 standard and is currently used as an enterprise backbone.

- 10 gigabit Ethernet:
  It is the fastest and most recent of the

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Ethernet standards IEEE 802.3ae defines a version of ethernet with a nominal rate of 10 Gbits/s, that with makes it 10 times faster than gigabit ethernet

IP Switching:

Internet Protocol switching, for more commonly reffered to as IP switching, is a routing technique which routes data packets faster than traditional routing by using layer-3 switches.

IP Switching is performed by implementing layer-3 switches which employ Application Specific Integrated Circuit (ASIC) hardware & transferring via Asynchronous Transfer Mode (ATM) switches.

Cable Testing:

Cable test instruments are designed with a variety of focused features for particular field tasks. They vary in price, performance and applications. Depending on the task, the field test instrument performs it can be classified with one of three hierarchical groups: certification, qualification, or verification.

- Wireshark Packet Analyser Tool:

Wireshark, a network analyser tool formally known as Ethereal, captures packets in real time and displays them in human-readable format. It includes filters, color coding and other features that

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let you dig deeper into network traffic and inspect individual packets.

Colour coding:
Wireshark uses colours to identify the types of traffic at a glance. By default, green is TCP traffic, dark blue is DNS traffic, light identifies TCP packets with problems for example, they could have been sent out of order.

- Steps for setting up LAN:
- Installation of Ethernet card in machine.
- crimping of Ethernet cable.
- Make straight cable in order to form star topology network to connect 2 different types of components eg. PC to switch or PC to router.
- Make cross cable in order to form state topology network to connect 2 similar types of components eg PC to PC or router to router.
- connect the cables to switch and from switch to the machines. Thus, it forms star topology
- Assign IP address. ping from one machine message is displayed.

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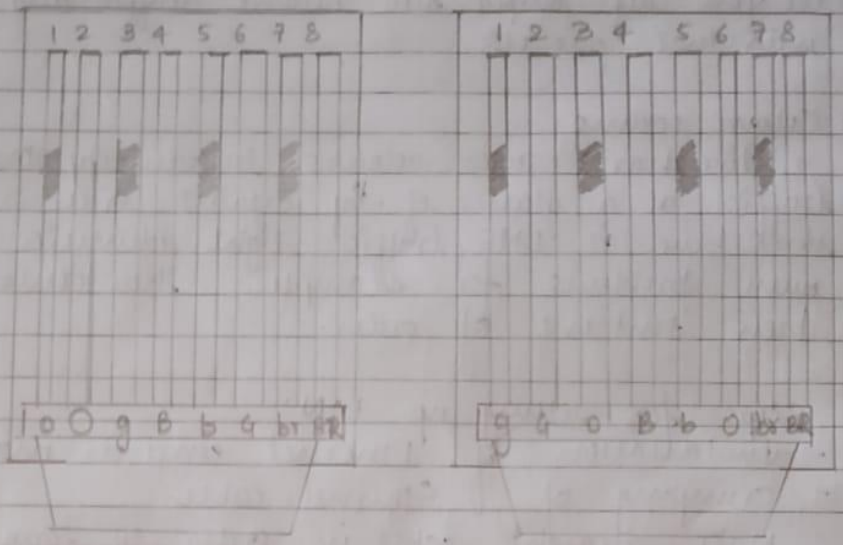
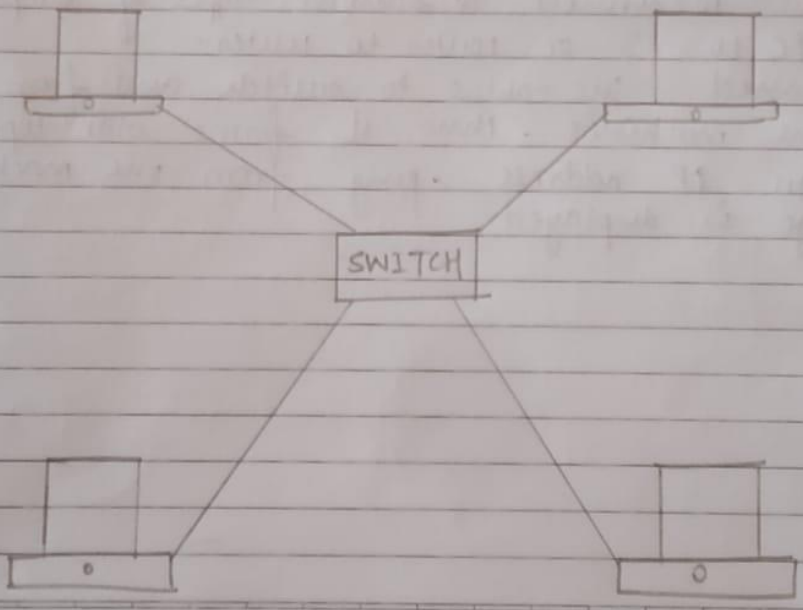


Straight through Cross-over

Star topology LAN created



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* Conclusion:

Thus we implemented a wired LAN using layer 2 switch. We also implemented/understood the structure & working of various networks including interconnecting devices used.

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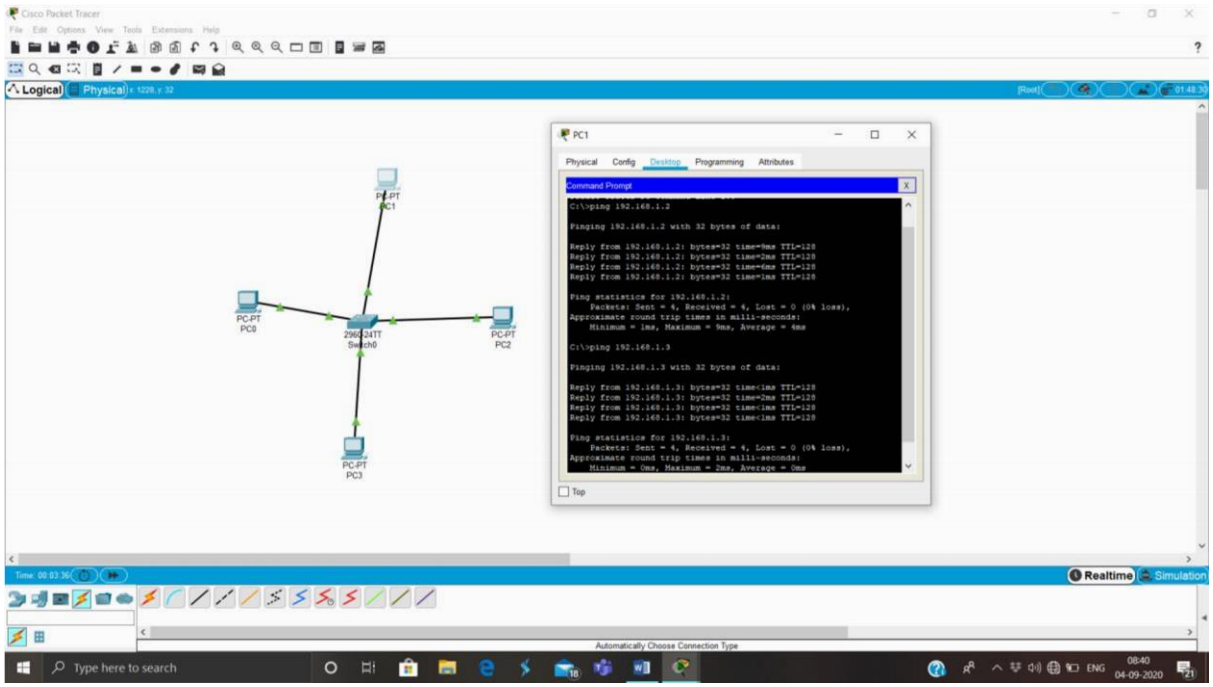
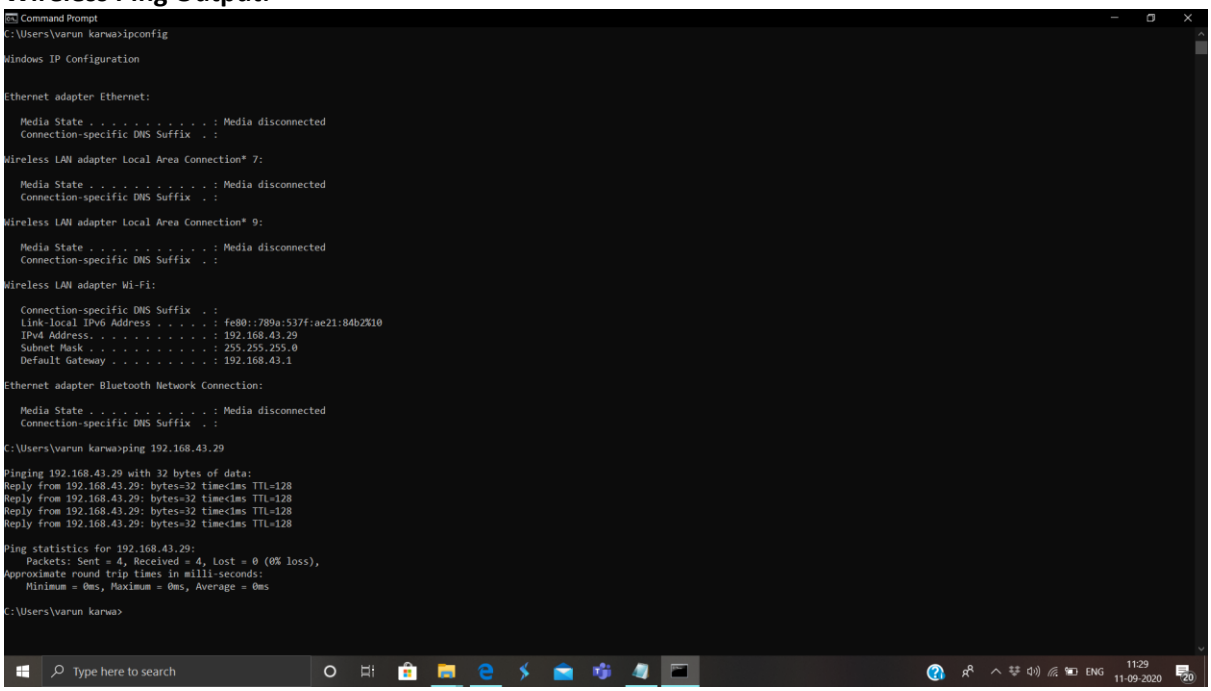
Testing by PING and Output:



Wireless Ping Output:



WireShark Output: