

Aim: Setup and configure a LAN (Local Area Network) using a switch and Ethernet cables in your lab.

What is LAN?

A Local Area Network (LAN) refers to a network that connects devices within a limited area, such as an office building or home. It enables users to share resources, including data, printers, and internet access. A local area network (LAN) switch serves as primary connecting device, managing and directing communications within the local network. Each connected device on a LAN switch can communicate directly with each other, allowing for fast and secure data transfer.

How to set up a LAN?

Step 1: Plan and Design an appropriate network topology taking into account network requirements and equipment location.

Step 2: You can take 4 computers, a switch with 8, 16, or 24 ports which is sufficient for network of these sizes, and 4 Ethernet cables.

Step 3: Connect your computers to network switch via an Ethernet cable, which is as simple as plugging one end of the Ethernet cable into your computer and the other end into your network switch.

Step 4: Assign IP address to your PCs

1. Log on to the client computer as Administrator or as owner.

2. Click Network and Internet Connections.

3. Right Click Local Area Connection / Ethernet → Go to Properties → Select Internet Protocol (TCP/IPv4) → Click on Properties → Select use the following ip address option and assign ip address.

Similarly assign IP address to all the PCs connected to switch

PC1 - IP address: 10.1.1.1, subnet mask 255.0.0.0
PC2 - IP address: 10.1.1.2, subnet mask 255.0.0.0
PC3 - IP address 10.1.1.3, subnet mask 255.0.0.0
PC4 - IP address 10.1.1.4, subnet mask 255.0.0.0

Step 5:

1. Connect your computer to the switch. To access the switch's web interface, you will need to connect your computer to switch using an Ethernet cable.
2. Log in to the web interface: Open a web browser and enter the IP address of the switch in the address bar. This should bring up the login page for the switch's web interface. Enter the username and password to log in.
3. Configure basic settings: Once you're logged in, you will be able to configure basic settings for the switch.

4. Assign IP address as: 10.1.1.5, subnet mask 255.0.0.0.

Step 6: Check the connectivity between switch and other machine by using ping command in the command prompt of the device.

Step 7: Select a folder → go to properties → click share tab → share it with everyone on the same LAN.

Step 8: Try to access the shared folder from other computers of the network.

Student observation:

Draw a neat diagram of the LAN in the configuration book that you have implemented in your lab. Write the ip configuration of each and every device. Write the outcome and challenges faced while configuring the LAN.

We implemented a LAN by connecting PCs through a switch. Each system was assigned an IP (e.g.: 192.168.1.2 - 192.168.1.5) with subnet mask 255.255.255.0 and gateway 192.168.1.1. All PCs communicated successfully using ping. The main challenges faced were IP conflicts, wrong subnet masks, and loose cable connections.

~~Success~~

Result:

The setup and configuration of LAN using a switch and Ethernet cables has been successfully installed and studied.