

Tribhuvan University
Faculty of Humanities and Social Sciences



Lab report on:
Computer Networking Lab 1:
Prepare Hardware & Software specification for basic computer system

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1 Objectives

- to learn about hardware & software requirements for a computer network
- to understand their purpose and differences among similar devices

2 Theory

A computer network is a group of connected networks that communicate with one another. This communication is made possible using various hardware & software means. Some of these requirements are:

2.1 Hub

It is a basic device which acts as a central node for the network. Each computer in the network is connected to it via *ports*. It enables communication by sending received data to all ports/computers, regardless of which computer it was supposed to send it to. This, combined with Hub operating in half-duplex mode means that when a computer sends data, all computers must wait and receive it, and then send out their data.

2.2 Switch

Switch is more advanced than Hub and allows routing, i.e. sending data only to the required computer. This is done using the MAC(Media Access Control) address, which is unique to all physical devices with networking capabilities. They are more secure than Hubs, and due to being full-duplex, allow fast, simultaneous communication.

2.3 Router

Routers are devices that find the best communication path between 2 separate networks. They do so using the destination IP(Internet Protocol) address, which are virtual addresses for networking-enabled devices. They are commonly used to create connection between home LANs and Internet Service Providers(ISPs).

2.4 Packet Tracer

Cisco Packet Tracer is a learning software created by Cisco Networking Academy as part of their accredited networking certification. It features lectures, videos and interactive material such as quizzes, games. It also creates realistic simulations of networking scenarios without the need for all the hardware.

2.5 RJ45

RJ45 is a standardized interface for connecting devices, networking equipment. The commonly used RJ45 connector has 8 pins , with pins 4 and 5 being the most important, thus the name.

This connector is used to connect ethernet cables between devices to access the internet or other networks.

2.6 Ethernet Cable

Ethernet is a commonly-used wired networking technology. It includes protocols, adapters and cabling that make it easy to setup a network. Ethernet cables consist of 8 wires, corresponding to the pins in an RJ45 connector, and transmit data in the form of electric signals.

2.7 Clamping Tool

Clamping Tools, also called Crimping Tools, are pincer-like instruments that allow fitting RJ45 connectors to ethernet patch cables easily. They have parts for stripping the outer insulation, trimming the inner wires, and attaching the connector. This allows us to use the exact length of wire we need.

3 Lab Work

Lab work consisted of physically observing these devices/tools and learning about them

4 Conclusion

Thus, we learned about the hardware & software essential for a computer network. We also saw some similar hardware devices and understood what differentiated them from one another