Faculty of Computing



**[Computer Communications & Network]**

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**Lab No 2 Tasks (Network Devices)**

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**Task 1: Write down the advantages and disadvantages of RJ45 connectors.**

**Answer:**

**ADVANTAGES**

1. The maintenance of RJ45 ports is also at a low cost.
2. RJ45 ports are designed to support high-speed data transfer.
3. RJ45 ports provide a more stable and secure connection. Physical connections created by RJ45 ports are less likely to suffer from signal loss.
4. The design makes the RJ45 port easy to install.
5. RJ45 ports are inexpensive.

**DISADVANTAGES**

1. R J-45 connectors are typically used for Ethernet cables, which have a limited range (usually up to 100 meters). Beyond this, the signal can weak.
2. Ethernet cables and RJ-45 connectors can be damaged if bent too much or crushed. This can cause the internet connection to slow down or stop working.
3. RJ-45 connectors need cables to connect devices, meaning you can’t move connected devices around easily.
4. RJ-45 connectors only work with specific types of cables, usually Ethernet cables. They won’t fit other connectors, like those for USB or HDMI. Also, different Ethernet cables (like Cat5 or Cat6) might need different RJ-45 connectors to work properly.

**Task 2: Briefly explain how the data is transmitted in wireless medium**

**Answer:**

A **wireless medium** is a way of sending data or information between devices without using physical cables or wires. Instead of cables, it uses things like radio waves, infrared, or even light to connect devices.

**Data Transmission:**

**Data Conversion**: First, the data (like a text message, video, or webpage) is converted into a form that can be sent through the air. This is usually done by converting the data into a series of electronic signals.

**Signal Transmission**: These signals are then sent out by a transmitter, like the one in your Wi-Fi router or smartphone. The transmitter changes the electronic signals into radio waves (or other types of waves) and sends them through the air.

**Signal Reception**: A receiver, like the one in your phone or laptop, picks up these radio waves. The receiver then converts the radio waves back into electronic signals.

**Data Interpretation**: Finally, your device reads these electronic signals and turns them back into the original data, like a video playing on your screen or a webpage loading in your browser.

**Task 3: Briefly explain all type of network topologies.**

**Bus Topology:**

* **Structure**: All devices are connected to a single central cable, called the "bus."
* **Advantages**: Simple and inexpensive to set up, good for small networks.
* **Disadvantages**: If the main cable fails, the entire network goes down.
* **Example**: Early versions of Ethernet networks used bus topology.

**2. Star Topology:**

* **Structure**: All devices are connected to a central device, like a hub or switch.
* **Advantages**: Easy to manage and expand; if one cable fails, the rest of the network remains unaffected.
* **Disadvantages**: If the central hub or switch fails, the whole network is disrupted.
* **Example**: Most home and office networks use star topology with a router in the center.

**3. Ring Topology:**

* **Structure**: Devices are connected in a circular fashion, where each device is connected to two others, forming a ring.
* **Advantages**: Data travels in one direction, reducing the chance of data collisions.
* **Disadvantages**: If one device or connection fails, the whole network can be affected.
* **Example**: Some token ring networks used in older LAN setups.

**4. Mesh Topology:**

* **Structure**: Every device is connected to every other device in the network.
* **Advantages**: Very reliable; if one connection fails, data can still be sent through another path.
* **Disadvantages**: Expensive and complex to set up due to the large number of connections.
* **Example**: Used in critical network setups where reliability is crucial, like military or advanced communication systems.

**5. Tree Topology:**

* **Structure**: A combination of star and bus topologies, where groups of star-configured networks are connected to a linear bus backbone.
* **Advantages**: Scalable and easy to manage; allows for hierarchical networks.
* **Disadvantages**: If the backbone fails, large portions of the network can be disrupted.
* **Example**: Large organizations with multiple departments might use tree topology.