Tishk International University
Science Faculty
IT Department

Computer Hardware

Lecture 04: Network Cards

2nd Grade – Fall Semester

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Lecture 04: Network Cards

Topics:

- Network Interface Card (NIC)
- LAN Cards
  - Ethernet NICs and Cables
  - Troubleshoot Ethernet Card Issues
  - Multi-Port cards
  - Fiber-Optic NICs
  - Desktop Wireless NICs
  - PCIe Mini Wifi Card
- Modem Cards
  - Dial up Modems
  - DSL Modems
  - VSAT Modems

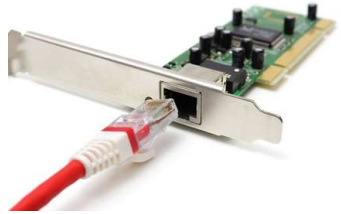
What is a Network Interface Card?

Network interface card (NIC), also known as network adapter card and network interface controller, is a hardware component allowing computers to communicate with other computers via the computer networks.

Ethernet NICs

- Ethernet is the most popular physical layer LAN technology in use today. It defines the number of conductors that are required for a connection, and provides the framework for data transmission.
- Ethernet is popular because it has a good balance between speed, cost and ease of installation.
- The first Ethernet standard is **IEEE 802.3** . Later standards are shown in next slide.
- Most desktop and laptop computers include one built-in Ethernet port that is used to connect the device to a wired network.



LAN Technology Specifications

Name	IEEE Standard	Data Rate
Ethernet	802.3	10 Mbps
Fast Ethernet/ 100Base-T	802.3u	100 Mbps
Gigabit Ethernet/ GigE	802.3z	1000 Mbps
10 Gigabit Ethernet	IEEE 802.3ae	10 Gbps

Ethernet Cables

Unshielded Twisted Pair (UTP) cabling is the major form of cabling used in wired networks and it comes in many different categories, CAT5e, CAT6, and CAT6a.

The “CAT” stands for the “category” of the cable. The higher the CAT number, the better the frequency and bandwidth for that cable.

The most common type of connector attached to UTP cables are RJ-45 connectors. It contains 4-pairs of wires inside them, which equals 8 wires in total.

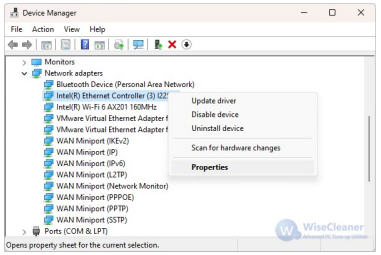
Troubleshoot Ethernet Card Issues

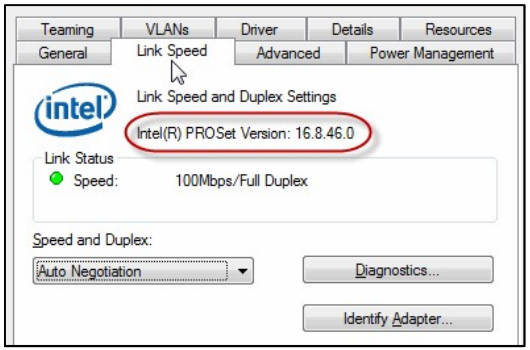
- Most of the **Common Issues** are:

1. The network cable is unplugged.
2. The network card is not installed properly.
3. Network card drivers are corrupt or missing.

- The common **troubleshooting tools** are:

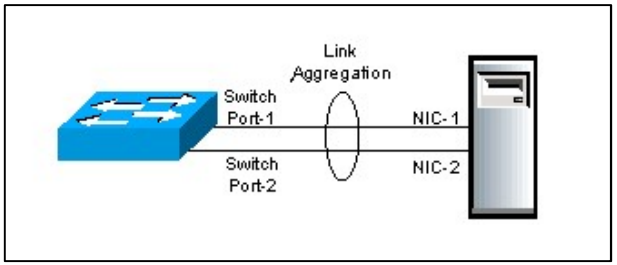
1. **Link lights**," or little LEDs that light up to indicate connection status, network activity status, or collision status
2. **The device management utility**: which can be run by typing devmgmt in the Windows command prompt to check the status of the NIC or if there needs to be a driver update.
3. **NIC diagnostic software**.



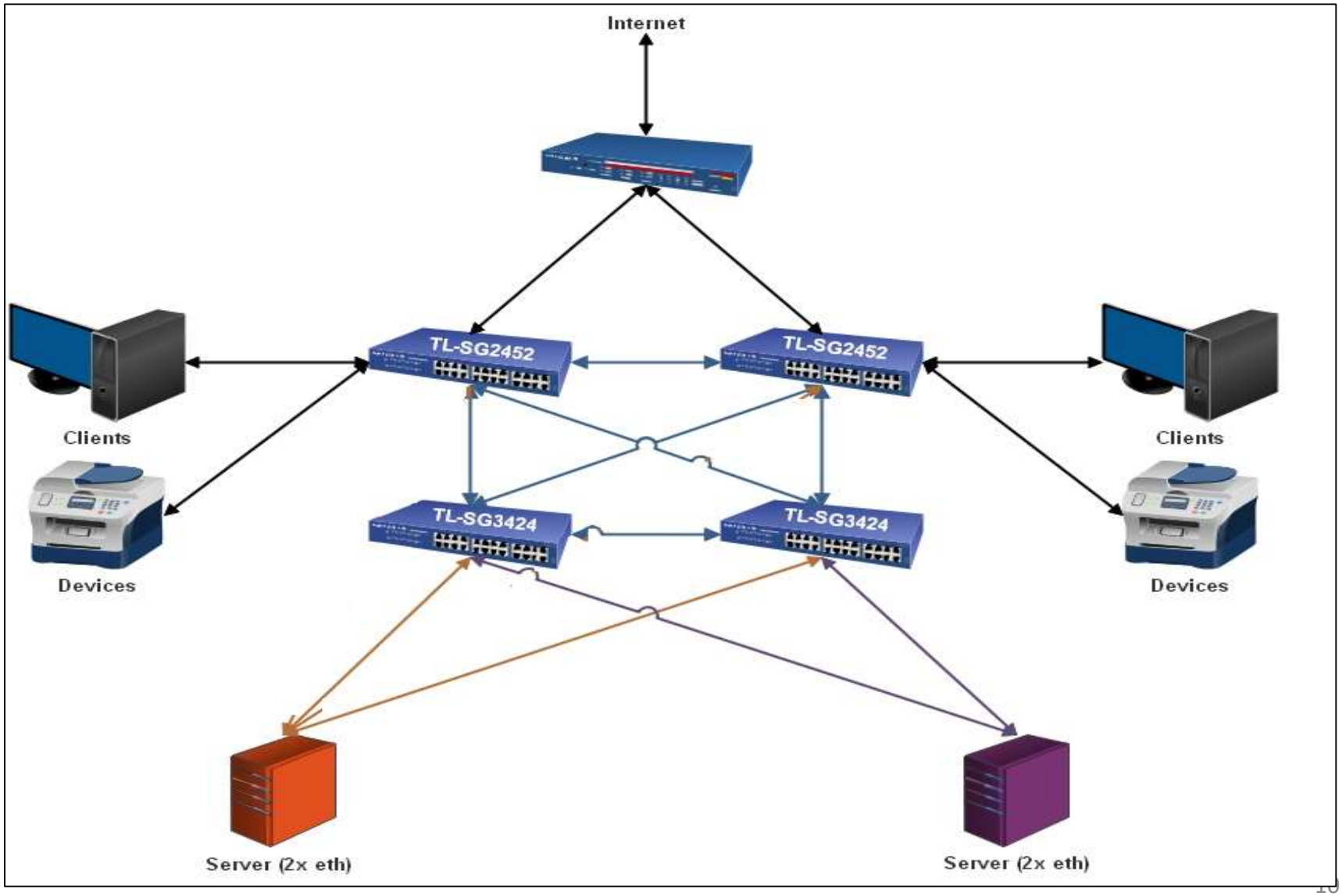


Multi-Ports Server NIC

- The multiport Ethernet network card designed to deliver the power, performance and enhanced capabilities for reliable network connections to the server.
- It offers **Link Aggregation**, which enables to add additional bandwidth to the system.
- The multiport Ethernet network card offers a cost-effective solution for IT professionals in government, educational, corporate, health care, or business environments where **access to multiple networks .**
- The server multiport Ethernet network card gives redundant, independent ports which can be used for building **redundant networks paths**.



Multi-Ports Server NIC Application



Fiber-Optic NICS

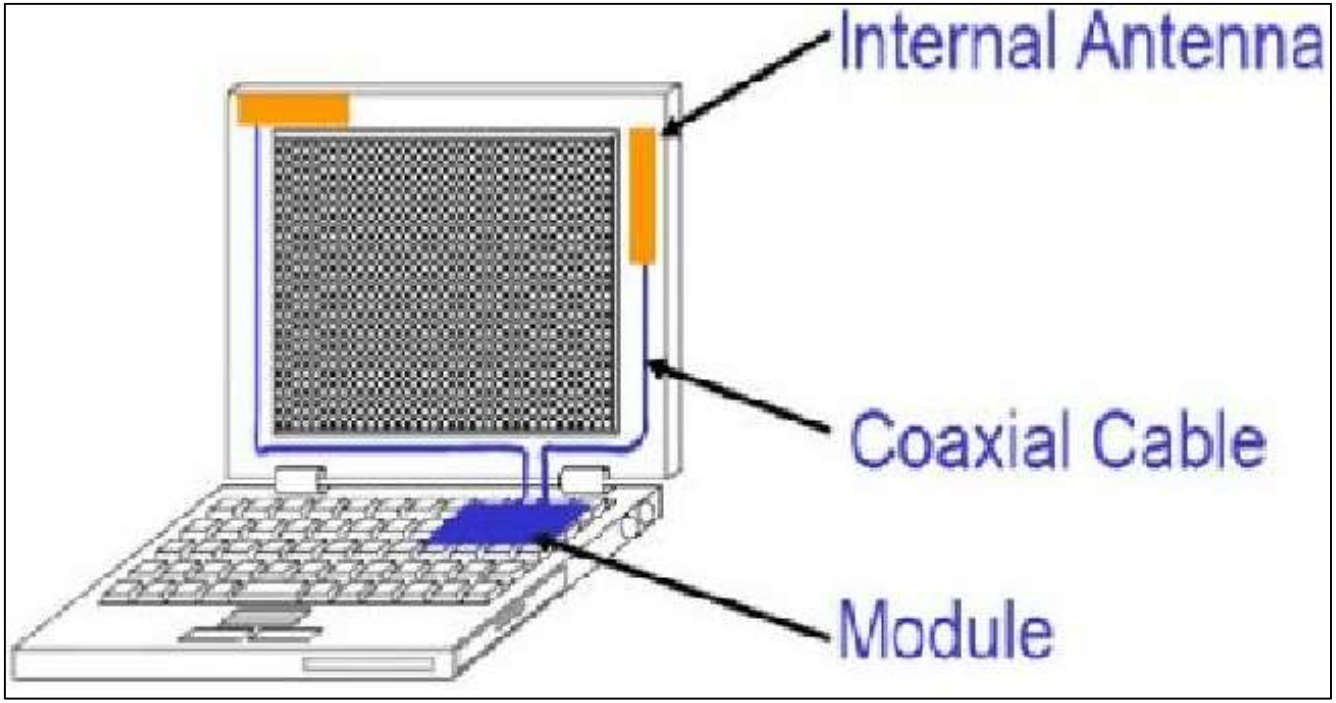
- Fiber-Optic NICs are like UTP NICs, but they come in a wide variety of connector types or ports. Fiber-Optics cabling manufactures use different types of fiber-optic connectors, such as SC connectors, LC connectors.
- Fiber-optic cables send data using light pulses. These light pulses are generated either via LEDs or lasers.
- Fiber-optic cables data can travel between 2km to 10km.

Desktop Wireless NICs

- Wireless NICs are mainly used to connect desktops to LAN without cables.
- Wireless standards are: IEEE 802.11a/b/g/n/ae.
- Wireless NICs use an antenna to transmit information onto the network via different radio frequencies. These wireless NICs can have the antenna built-in or external.

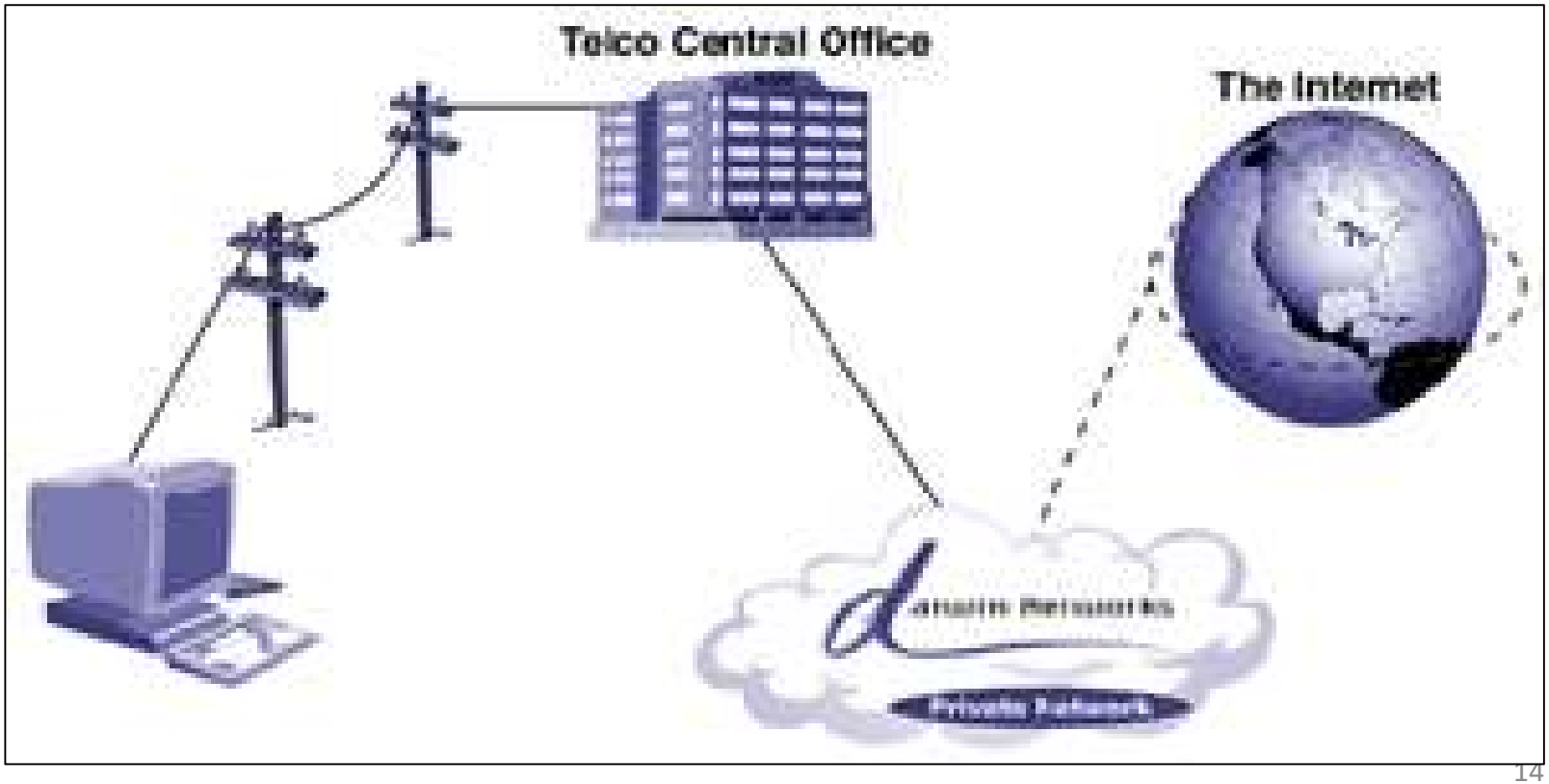
PCIe Mini Wifi Card

The PCIe Mini Card offers wifi connectivity to laptops and small desktops. The antenna is normally a conductor inside the laptop body.



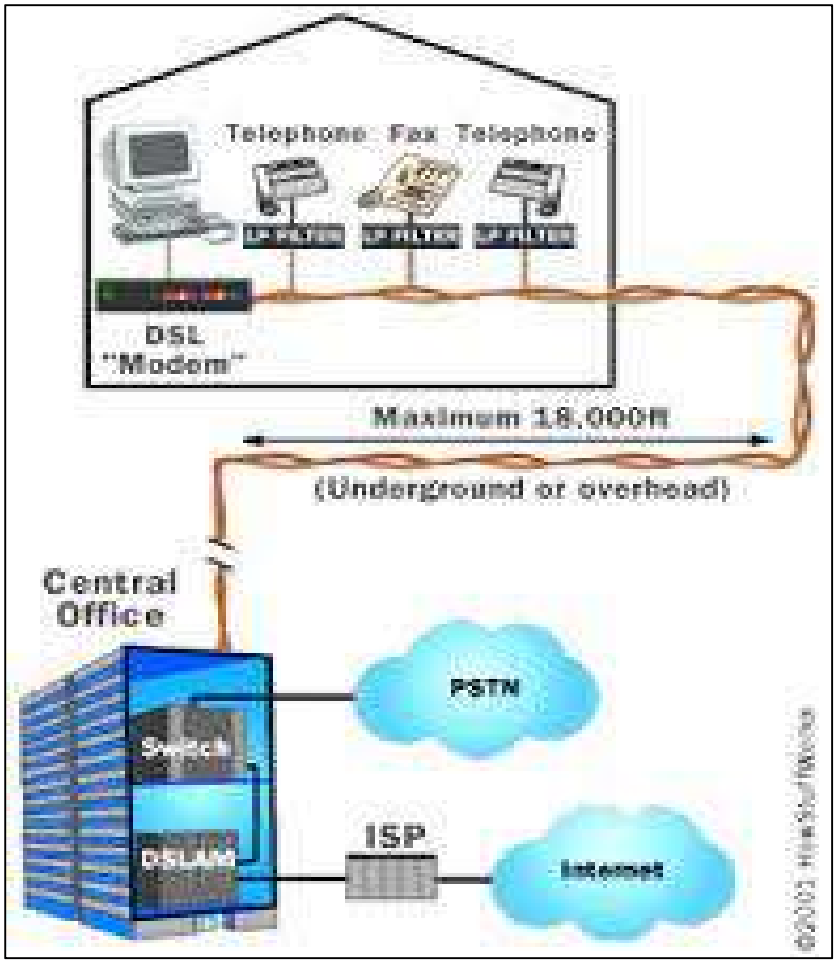
Dial UP modem

It’s a device that uses dial up network to connect the computer to Internet. It has RJ11 port to connect to telephone network. The speed normally is 56 Kbps.



DSL modem

It’s a device that uses dial up network with frequencies higher than voice signal frequency to connect computer to Internet. It has RJ11 port to connect to telephone network. The speed normally is 300 Kbps to 10 Mbps.



VSAT modem

It’s a device that uses Satellite network to connect computer to Internet. It has RF port to connect to Dish that connects to the Satellite.