**802 Standards. IEEE 802.2, 802.3, 802.5, 802.11**

**The Institute of Electrical and Electronics Engineers** is a standards setting body. Each of their standards is numbered and a subset of the number is the actual standard. The 802 family of standards is ones developed for computer networking.

**IEEE, or Institute of Electrical and Electronics Engineers,** is a standards setting body. They create standards for things like networking so products can be compatible with one another. We will look at several networking technologies: 802.2, 802.3, 802.4 802.5, 802.11, and FDDI. Each of these is just a standard set of technologies, each with its own characteristics.

**802.2 Logical Link Control**

802.2 is "the standard for the upper Data Link Layer sub-layer also known as the Logical Link Control layer. It is used with the 802.3, 802.4, and 802.5 standards."

802.2 "specifies the general interface between the network layer (IP) and the data link layer (Ethernet, Token Ring, etc).

802.2 is concerned with managing traffic over the physical network. It is responsible for flow and error control. The Data Link Layer wants to send some data over the network, 802.2 Logical Link Control helps make this possible. It also helps by identifying the line protocol, like NetBIOS, or Netware.

**802.3 Ethernet**

802.3 is the standard which Ethernet operates by. It is the standard for CSMA/CD (Carrier Sense Multiple Access with Collision Detection). This standard encompasses both the MAC and Physical Layer standards.

The original 802.3 standard is 10 Mbps (Megabits per second). 802.3u defined the 100 Mbps (Fast Ethernet) standard, 802.3z/802.3ab defined 1000 Mbps Gigabit Ethernet, and 802.3ae define 10 Gigabit Ethernet.

Commonly, Ethernet networks transmit data in packets, or small bits of information. A packet can be a minimum size of 72 bytes or a maximum of 1518 bytes.

The most common topology for Ethernet is the star topology.

**802.5 Token Ring**

Token Ring was developed primarily by IBM. Token ring is designed to use the ring topology and utilizes a token to control the transmission of data on the network.

The token is a special frame which is designed to travel from node to node around the ring. When it does not have any data attached to it, a node on the network can modify the frame, attach its data and transmit. Each node on the network checks the token as it passes to see if the data is intended for that node, if it is; it accepts the data and transmits a new token. If it is not intended for that node, it retransmits the token on to the next node.

Originally, token ring operated at a speed of about 4 Mbps and 16 Mbps. 802.5t allows for 100 Mbps speeds and 802.5v provides for 1 Gbps over fibber.

Token ring utilizes a Multi-station Access Unit (MAU) as a central wiring hub. This is also sometimes called a MSAU when referring to token ring networks.

**802.11 Wireless Network Standards**

802.11 is the collection of standards setup for wireless networking.

802.11a was one of the first wireless standards. 802.11a operates in the 5Ghz radio band and can achieve a maximum of 54Mbps.

802.11b operates in the 2.4Ghz band and supports up to 11 Mbps. Range of up to several hundred feet in theory. The first real consumer option for wireless and very popular.

802.11g is a standard in the 2.4Ghz band operating at 54Mbps. Since it operates in the same band as 802.11b, 802.11g is compatible with 802.11b equipment. 802.11a is not directly compatible with 802.11b or 802.11g since it operates in a different band.

Wireless LANs primarily use CSMA/CA - Carrier Sense Multiple Access/Collision Avoidance. It has a "listen before talk" method of minimizing collisions on the wireless network. This results in less need for retransmitting data.

Wireless standards operate within a wireless topology.