What Is A Computer Network? Essay, Research Paper

What is a computer network? In simple terms, a computer network is a group of connected computers that allow the sharing of information and equipment. The most ordinary network is made up of two computers connected by some kind of cable in order to exchange information more quickly and efficiently. A standalone computer is very useful to many businesses, but without a network, those businesses would have to spend twice the amount of money then they would have to by having a network. A network allows many computers and peripheral devices such as printers and facsimile machines to be connected to each other. The two primary benefits of computer networking are sharing devices and data sharing.

There are two basic types of networks: peer-to-peer and server-based. On a peer-to-peer network, any computer can act as a server to share resources with other machines and as a client to access resources from other machines. On the other hand, server-based networks require a server computer whose job is to respond to requests for services or resources from clients elsewhere on the network. Server-based networks are used in many and most organizations today. Although there is much advantage to server-based networks such that it centralizes user accounts and eases maintenance with a lot less need for administration, there are some disadvantages as well. One of the greatest and most common disadvantages is server failure. When the server fails, the whole system is considered useless until the server is fixed. That may cut down productivity and rise expenses. As well, in order to cut down on server failure special-purpose server software and hardware and expert staff is required. This may also rise expenses, but in the long run it may turn out to be very profitable.

Before all this is said and done, a network layout in other words the topology of the network must be determined. The term topology not only refers to the physical layout but how the computers, cables and other resources communicate with each other. There are three basic types of topologies: bus, ring, and star. A bus topology consists of computers connected along a single cable segment. This cable segment is referred to as a backbone. A bus topology is the most common method for connecting computers. However there is one major drawback, a single cable break can terminate the whole network. This goes for the ring topology method as well. The ring topology networks are constructed when a cable, forming a circle connects all the computers to each other. The ring topology uses something called token passing. This is a method of sending data within the ring. When a computer sends a file for example, it travels through the ring until it reaches its destination point. Each computer is given an equal chance to send data; therefore none of the computers can occupy the network. But as everything else has a flaw, so does a ring topology network. The entire network will fail if one computer in the ring fails, unless it is in a dual-ring network, where the network can operate around a failure. At last, a star topology is used when a hub connects all the computers together. A hub is a central unit that is used to retransmit a signal, which is sent from one computer to another. If the hub fails, the network fails. Contrariwise, if one computer fails, it does not have an affect on the network. That is a vital advantage to the star topology.

The cables that connect all the computers together are frequently referred to as the networking media. There are many types of cables in the market today, but the three most commonly used are coaxial, fiber-optic and twisted-pair (TP) cable. Coaxial cable, coax for short, consists of two types: thin Ethernet (thinnet) and thick Ethernet (thicknet). There are many differences between thinnet and thicknet such as the maximum length of cable, bend radius, cost, etc. Over all, thinnet is a better choice out of the two. It is much more simple and flexible but shorter reach. Fiber-optic cable is an excellent networking media but very expensive as well. Fiber-optic cable eliminates any possibility of electronic eavesdropping, since no electric signals can ever pass though the cable. The maximum cable length is anywhere from 2 kilometers to 100 kilometers. Unlike coax thinnet and thicknet cables that have a maximum range of 185 to 500 meters respectively. Fiber-optic cable is very complicated to install, and is also very sensitive to strain and bending. In addition, there is also the cost factor that s been already mentioned. All of this combined makes it a poor choice when compared to other options, such as TP. There are two basic types of twisted-pair cable: unshielded twisted pair (UTP) and shielded twisted pair (STP). Even though the maximum length of a UTP segment is 100 meters, it is the most common structure of cabling as well the least expensive. It is very easy to install and it s not a subject to bend limitations.

As already mentioned, having a network is a time and money saver. And more and more organizations are entering The Wireless World. Wireless networking has grown very rapidly in the past few years, the well-known Internet for example. Having mentioned that, there probably isn t a need to explain how much the technology has advanced and how important computer networking is to this advancement.