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Project: How to build your Local Area Network (LAN)

Types of network protocol:

1-Ethernet

The Ethernet protocol is by far the most widely used. This is a system where each computer listens to the cable before sending anything through the network. If the network is clear, the computer will transmit. the computer will wait and try again when the line is clear. Sometimes, two computers attempt to transmit at the same instant. When this happens a collision occurs.

Data can be transmitted over twisted pair, coaxial, or fiber optic cable at a speed of 10 Mbps.

2-Fast Ethernet

To allow for an increased speed of transmission to 100 Mbps. requires the use of different, more expensive network hubs and network interface cards. In addition, category 5 twisted pair or fiber optic cable is necessary.

3-Gigabit Ethernet

The most recent Ethernet protocol standard. It has a transmission speed of 1 Gbps. It can be used with both fiber optic cabling and copper.

4-LocalTalk

LocalTalk is a network protocol that was developed by Apple Computer, Inc. for Macintosh computers. Its speed of transmission is only 230 Kbps., It use a twisted pair cable.

5-Token Ring

The Token Ring protocol was developed by IBM. In Token Ring, the computers are connected so that the signal travels around the network from one computer to another in a logical ring, until it captured by the receiving computer.

It has a transmission speeds of 4 Mbps or 16 Mbps.

It can be used with twisted pair or fiber optic cable.

6-FDDI

Fiber Distributed Data Interface (FDDI) is a network protocol that is used primarily to interconnect two or more local area networks. It operates over fiber optic cable at 100 Mbps.

7-ATM

ATM is most often used to interconnect two or more local area networks.

ATM works by transmitting all data in small packets of a fixed size; transmits data at a speed of 155 Mbps and higher. ATM supports a variety of media such as video, CD-quality audio, and imaging. It can use fiber optic as well as twisted pair cable.

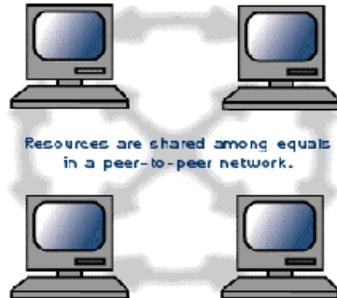
8-Wireless LANs

Wireless LANs use high frequency radio signals, infrared light beams, or lasers to communicate between the workstations and the file server.

Choosing the right network:

Peer-to-Peer

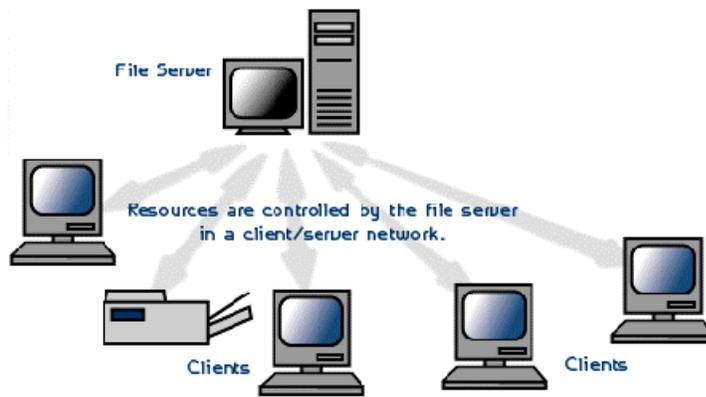
In a peer-to-peer network, all computers are considered equal; they all have the same abilities to use the resources available on the network and to access shared resources found on other computers



Client/Server

The file servers become the heart of the system, providing access to resources and providing security.

Individual workstations (clients) have access to the resources available on the file servers.



The elements of a local area network (LAN):

Wiring

The most popular variety of networking is called Ethernet. Ethernet LAN using 'twisted-pair' wiring comes in two speeds, 10 Mbs (megabits per second) and 100 Mbs. Known as 10Base-T and 100BaseT.



Twisted pair

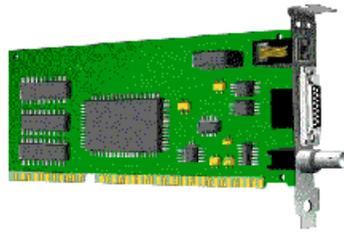


Fiber Cable

Network Interface Cards (NIC's)

The computer needs a network interface card to connect to the Ethernet wiring
I assume we use a PCI card.

Network Interface Card



Network Hubs

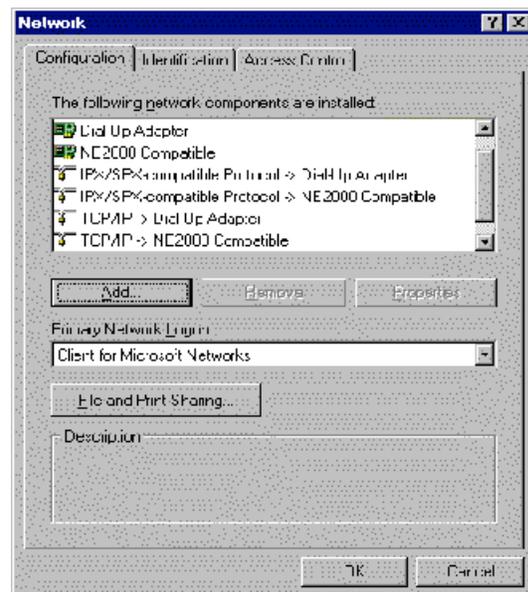
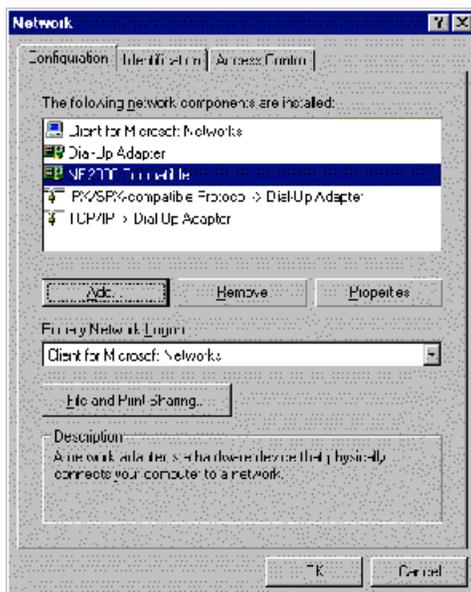
A network hub connects these individual workstation cables together like the spokes on a wheel. These hubs are available in 10Mbps, 100Mbps, or 10/100 auto-sensing speeds and range from 4 to 24 ports, which connect to individual workstations.

Proxy

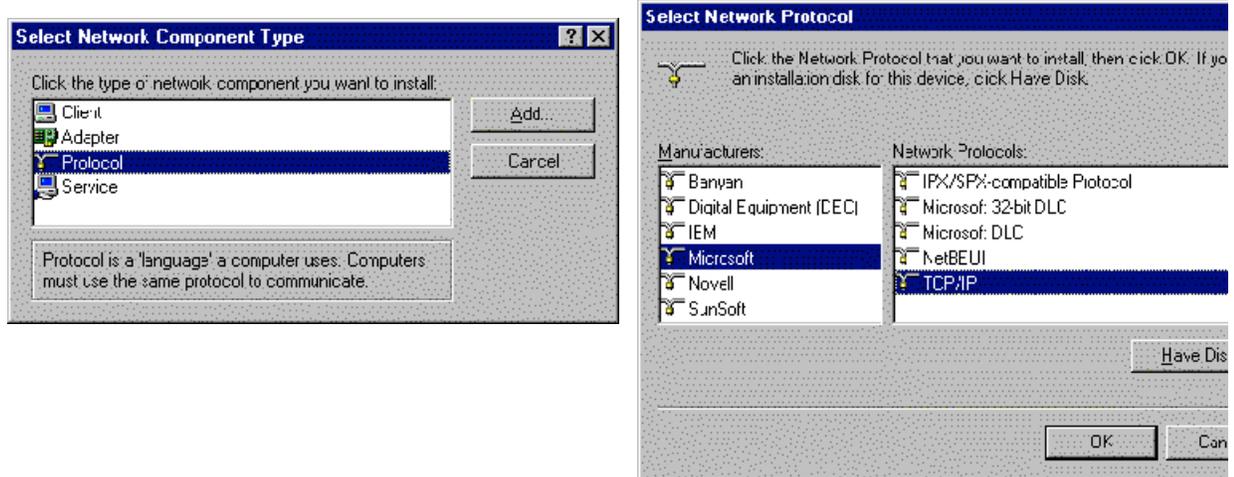
Is a method of sharing of Internet access. Proxy operates with the data on a higher protocol level so that Internet sharing with Proxy servers was never reliable.

Getting to install the local area network (LAN):

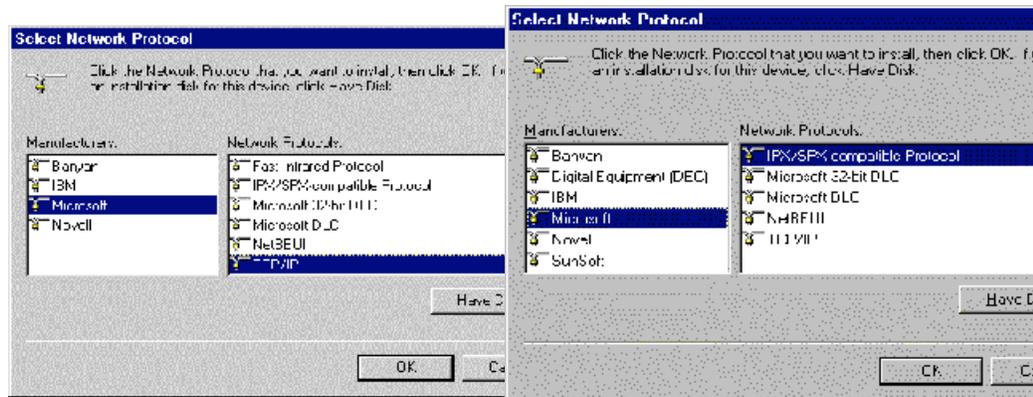
- First we will install the NIC card, by open the computer case, and then insert the card into the expansion slot on the motherboard that match it's size. Press firmly so the entire part of the card that has the gold contacts goes completely into the expansion slot on the motherboard and will go no further. Reboot the computer, and it will detect the new card. To install its driver, insert the CD or the Floppy disk came with it, and follow the instruction.
- After everything is installed you'll need to setup the windows 95/98 peer to peer networking. This is the standard Windows setup for a low security network. Go into the Control Panel and select the "Network Icon. This will bring up your network properties screen.
- If the network card is installed properly. The network card should appear in the list of installed network components. If not we need to install it
- Check to see if Windows already installed TCP/IP and IPX/SPX for the network card. If they're not there, you'll have to install it yourself. Don't worry, it isn't hard. You just need your Windows 95/98 install CD, or have the installation file somewhere on your hard disk.



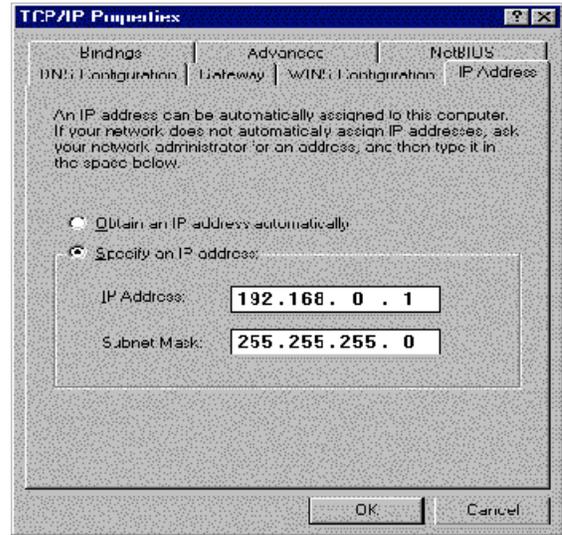
We'll install TCP/IP first. Go to the network menu and highlight your network card.
 Now, click on the add button. That will take you to the "Select Network Component Type" window. Highlight protocol, then click add.
 That will open the "Select Network Protocol" window. Go down the left side, and select "Microsoft" from the list of manufacturers on the left. Then select "TCP/IP" from the list of Network Protocols on the right. Click OK



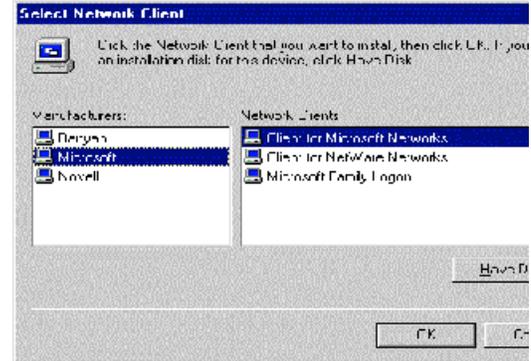
- Lastly, repeat the above steps again, but choose "NetBEUI" in the "Select Network Protocol" window. NetBEUI will make Microsoft file and printer sharing much better. After installing NetBEUI, go to its property window, and check the "Set this protocol to be the default protocol" in the advanced tab. Don't install NetBEUI if you aren't going to use Microsoft file and printer sharing.



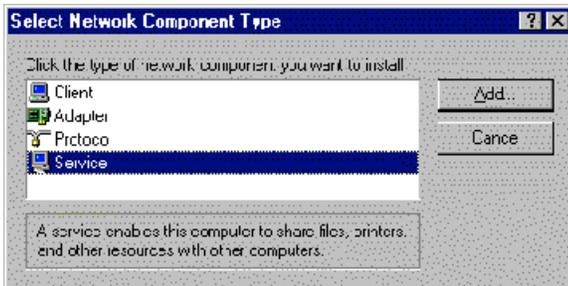
- Highlight the "TCP/IP --> NE2000 Compatible" line in the list of installed components. Now click on properties.
 That will open up the TCP/IP Properties window. Select "Specify an IP address."
 According to RFC 1918, private IP addresses should stay within these ranges:
 Class A: 10.0.0.0 to 10.255.255.255
 Class B: 172.16.0.0 to 172.31.255.255
 Class C: 192.168.0.0 to 192.168.255.255



- You'll also need to install Microsoft Networking so the systems participating on the LAN can communicate through the TCP/IP and IPX protocols. Access Network Properties; select "Add," "Client." Select "Microsoft," and "Client for Microsoft Networks."



- To share resources with the other computers on the net Click the add button in the Network window. Select service at the bottom of the list. Clicks add. That will open the "Select Network Service" window. Select "Microsoft" on the left, and then select "File and Printer Sharing for Microsoft Networks" on the right. Click OK.



- Now you want to go back and verify that everything is set up correctly. Pull up TCP/IP and select the Bindings tab. Verify that both "File and Print Sharing" and "Client for Microsoft Networks" are checked, and do the same for IPX/SPX. You must share something (a printer, drive, folder, anything) on the system for it to appear in the network neighborhood of other computers on the network. You can do this by right-clicking on the drive to be shared, and select "sharing..." Select a share name, hit "apply" and your drive or printer will appear on the network.
- To check the net is set up correctly, use a dos command "ping " with the computer IP.
If everything is set up correctly, you'll see each system listed in the Network Neighborhood.
- And that is all for building a small local area network (LAN).

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