What Are IP Addresses?

An IP address is a 32-bit identifier assigned to a host that uses the Internet Protocol. The IP address is represented by four octets (8-bit fields). In decimal form, an IP address consists of four fields separated by dots, where each field contains a value in the range 0 - 255. This is called *dotted decimal notation*.

Each host ID must be unique within a given network, and each network number must be unique within a given internet. Host IDs are assigned by the network administrator. The network number is assigned by the inter-network administrator. For a public network on the Internet, you must obtain a network number assigned by the Network Information Center (NIC).

An IP address consists of two parts. The first part of the address, called the network number, identifies a network on the internet; the remainder, called the host ID, identifies an individual host on that network. Historically, three classes of IP addresses have been defined:

- **Class A**--Only the first field identifies the network, and the number in the first field must be in the range 1 - 126 (127 is reserved for loopback). Class A networks are very large. Host numbers 0.0.0 and 255.255.255 are reserved, and one octet is reserved for other purposes, so there can be almost 17 million (2^24 - 2) hosts in a class A network. The 126 class A network numbers have been allocated.

  Example: 26.4.0.1, for host 4.0.1 on net number 26.

- **Class B**--The first two fields identify the network, and the number in the first field must be in the range 128 - 191. Class B networks are large. Host numbers 0.0 and 255.255 are reserved, so there can be up to 65,534 (2^16 - 2) hosts in a class B network. Most of the 16,382 class B addresses have been allocated.

  Example: 128.89.0.26, for host 0.26 on net 128.89.

- **Class C**--The first three fields identify the network, and the number in the first field must be in the range 192 - 223. (The range 224 - 255 is reserved for classes D and E, for experimental work.) Class C networks are relatively small. Host numbers 0 and 255 are reserved, so there can be up to 254 (2^8-2) hosts in a class C network. Most LANs are class C networks. There can be over 2 million class C networks in an internet.

  Example: 192.15.28.16, for host 16 on net 192.15.28.