Internet Protocol (IP): Version 4 (IPv4)

IP header

- The format of the header is explained in "IPv4" on Wikipedia

  (https://en.wikipedia.org/wiki/IPv4#Header)

- The header is 20 bytes in length, longer if options are present.

- There are many fields in the header, notably:
  - Version- the version of IP; in this case, 4
  - IHL- the length of the header
  - Total length- the total length of the packet (header + payload)
  - Protocol- the type of payload packet; usually TCP or UDP
  - Source IP Address
  - Destination IP Address

Special use addresses

- Certain IP addresses are reserved for special uses.

- 127.0.0.0/8 is reserved for loopback addresses, i.e., localhost

- 10.0.0.0/8 is reserved for private networks (16 million addresses)

- 192.168.0.0/16 is also reserved for private networks (64k addresses)

IPv4 address exhaustion

- Although the four bytes of IPv4 provides potentially 4 billion addresses, IPv4 addresses were exhausted in 2011.
- More than 4 billion hosts using IPv4 can connect to the Internet because of Network Address Translation (NAT), which will be discussed later.