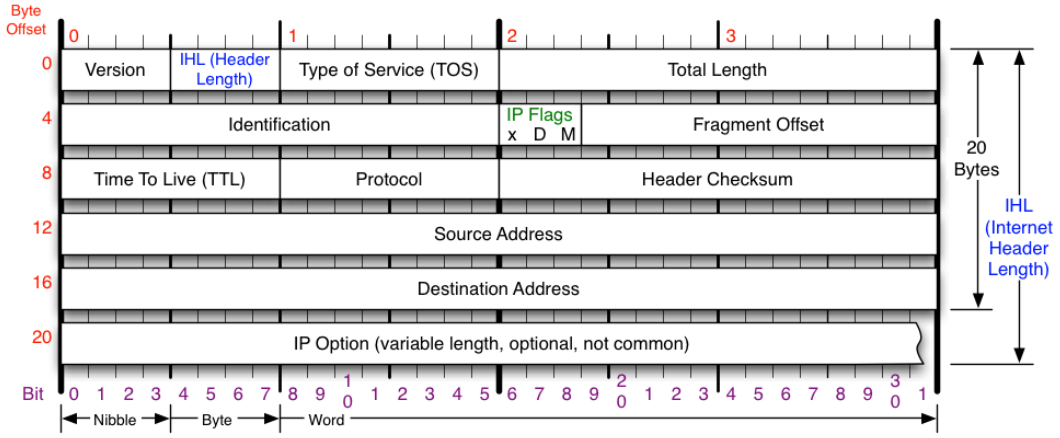
IPv4 Header



Version

Version of IP Protocol. 4 and 6 are valid. This diagram represents version 4 structure only.

Header Length

Number of 32-bit words in IP header, minimum value of 5. Multiply by 4 to get byte count.

Protocol

IP Protocol ID. Including (but not limited to):

1 ICMP	17 UDP	57 SKIP
2 IGMP	47 GRE	88 EIGRP
6 TCP	50 ESP	89 OSPF
9 IGRP	51 AH	115 L2TP

Total Length

Total length of IP datagram, or IP fragment if fragmented. Measured in Bytes.

Fragment Offset

Fragment offset from start of IP datagram. Measured in 8 byte (2 words, 64 bits) increments. If IP datagram is fragmented, fragment size (Total Length) must be a multiple of 8 bytes.

Header Checksum

Checksum of entire IP header

IP Flags

x D M

x 0x80 reserved (evil bit)
D 0x40 Do Not Fragment
M 0x20 More Fragments follow

RFC 791

Please refer to RFC 791 for the complete Internet Protocol (IP) Specification.

IPv6 Header

Version

Version of IP Protocol. 4 and 6 are valid. This diagram represents version 6 structure only.

Traffic Class

8 bit traffic class field.

Flow Label

20 bit flow label.

Payload Length

16-bit unsigned integer. Length of the IPv6 payload, i.e., the rest of the packet following this IPv6 header, in octets. Any extension headers are considered part of the payload.

Source Address

128-bit address of the originator of the packet.

Next Header

8-bit selector. Identifies the type of header immediately following the IPv6 header. Uses the same values as the IPv4 Protocol field.

Destination Address

128-bit address of the intended recipient of the packet (possibly not the ultimate recipient, if a Routing header is present).

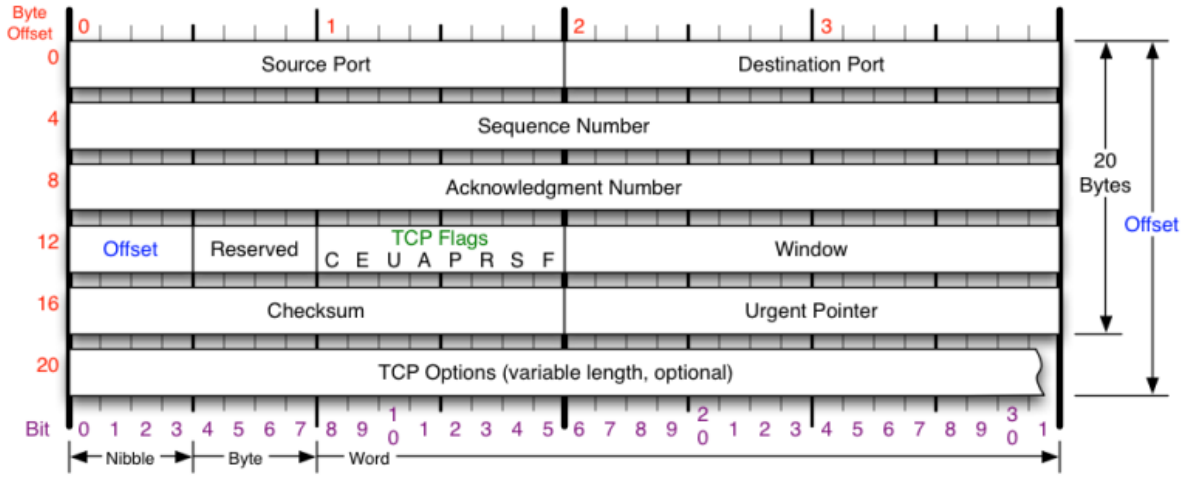
Hop Limit

8-bit unsigned integer. Decremented by 1 by each node that forwards the packet. The packet is discarded if Hop Limit is decremented to zero.

RFC 2460

Please refer to RFC 2460 for the complete Internet Protocol version 6 (IPv6) Specification.

TCP header



TCP Flags

C E U A P R S F

Congestion Window
C 0x80 Reduced (CWR)
E 0x40 ECN Echo (ECE)
U 0x20 Urgent
A 0x10 Ack
P 0x08 Push
R 0x04 Reset
S 0x02 Syn
F 0x01 Fin

Congestion Notification

ECN (Explicit Congestion Notification). See RFC 3168 for full details, valid states below.

Packet State	DSB	ECN bits
Syn	0 0	1 1
Syn-Ack	0 0	0 1
Ack	0 1	0 0
No Congestion	0 1	0 0
No Congestion	1 0	0 0
Congestion	1 1	0 0
Receiver Response	1 1	0 1
Sender Response	1 1	1 1

TCP Options

0 End of Options List
1 No Operation (NOP, Pad)
2 Maximum segment size
3 Window Scale
4 Selective ACK ok
8 Timestamp

Checksum

Checksum of entire TCP segment and pseudo header (parts of IP header)

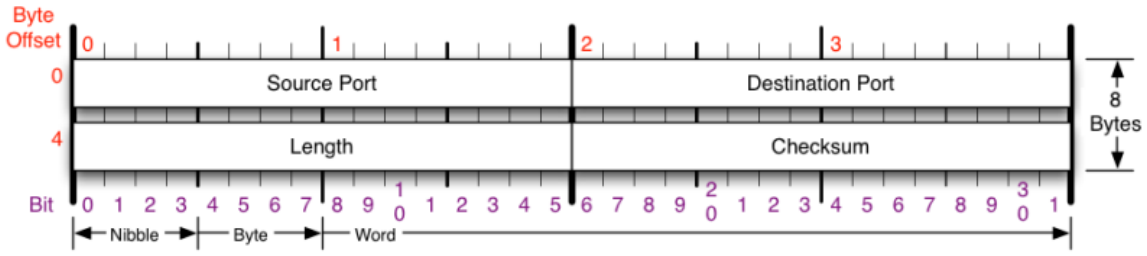
Offset

Number of 32-bit words in TCP header, minimum value of 5. Multiply by 4 to get byte count.

RFC 793

Please refer to RFC 793 for the complete Transmission Control Protocol (TCP) Specification.

UDP header



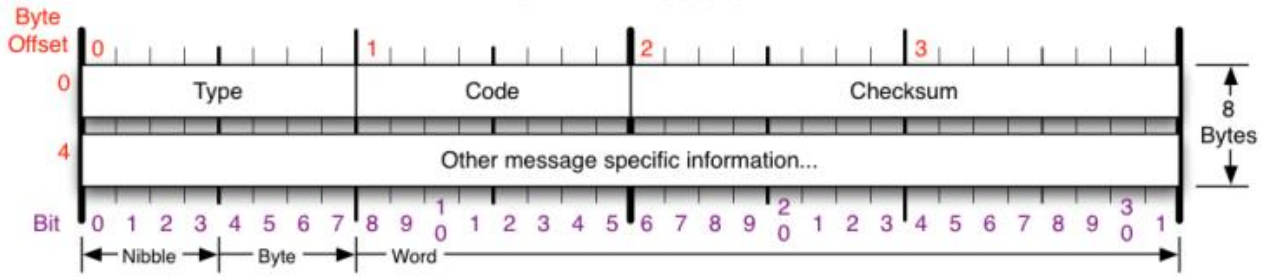
Checksum

Checksum of entire UDP segment and pseudo header (parts of IP header)

RFC 768

Please refer to RFC 768 for the complete User Datagram Protocol (UDP) Specification.

ICMP header



ICMP Message Types

Type	Code/Name
0	Echo Reply
3	Destination Unreachable
	0 Net Unreachable
	1 Host Unreachable
	2 Protocol Unreachable
	3 Port Unreachable
	4 Fragmentation required, and DF set
	5 Source Route Failed
	6 Destination Network Unknown
	7 Destination Host Unknown
	8 Source Host Isolated
	9 Network Administratively Prohibited
	10 Host Administratively Prohibited
	11 Network Unreachable for TOS
3	Destination Unreachable (continued)
	12 Host Unreachable for TOS
	13 Communication Administratively Prohibited
4	Source Quench
5	Redirect
	0 Redirect Datagram for the Network
	1 Redirect Datagram for the Host
	2 Redirect Datagram for the TOS & Network
	3 Redirect Datagram for the TOS & Host
8	Echo
9	Router Advertisement
10	Router Selection
11	Time Exceeded
	0 TTL Exceeded
	1 Fragment Reassembly Time Exceeded
12	Parameter Problem
	0 Pointer Problem
	1 Missing a Required Operand
	2 Bad Length
13	Timestamp
14	Timestamp Reply
15	Information Request
16	Information Reply
17	Address Mask Request
18	Address Mask Reply
30	Traceroute

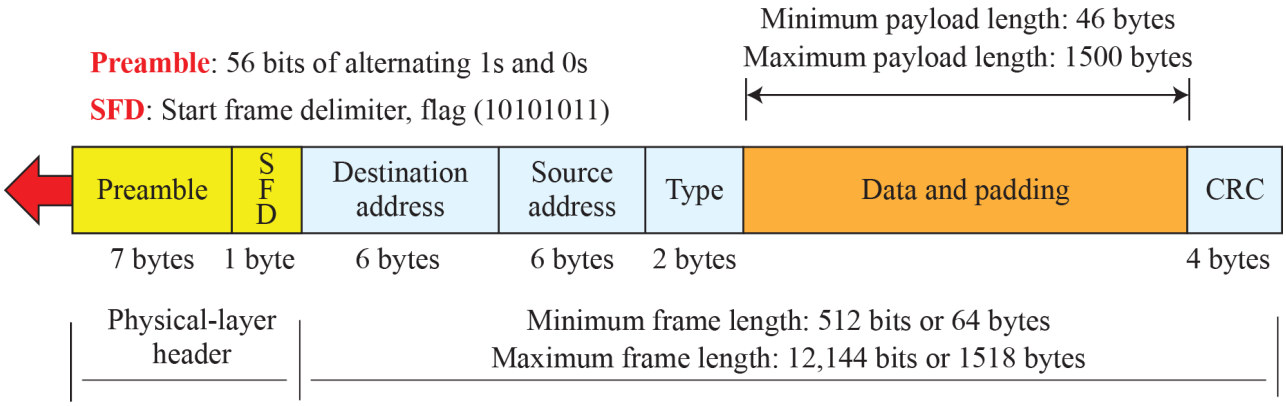
Checksum

Checksum of ICMP header

RFC 792

Please refer to RFC 792 for the Internet Control Message protocol (ICMP) specification.

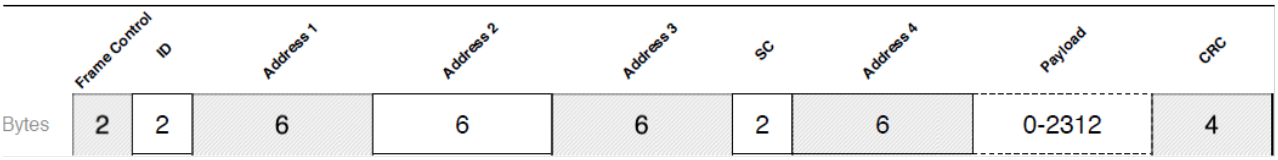
Ethernet header



The TYPE field

CODE (HEXADECIMAL)	MEANS
0800	IPv4
0806	ARP
86dd	IPv6

IEEE 802.11 header



SC = Sequence control

ARP header