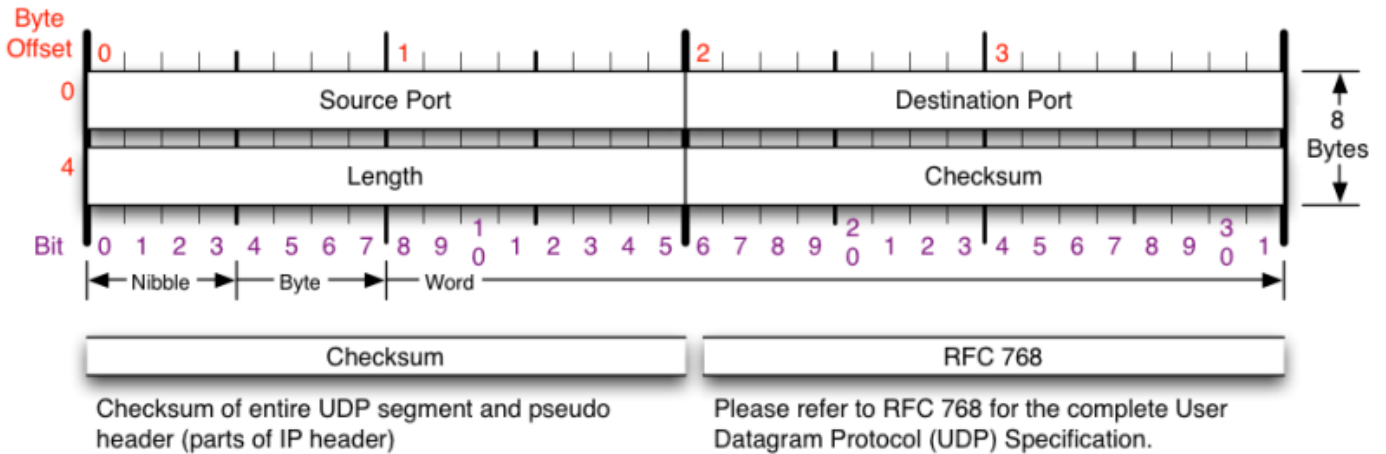


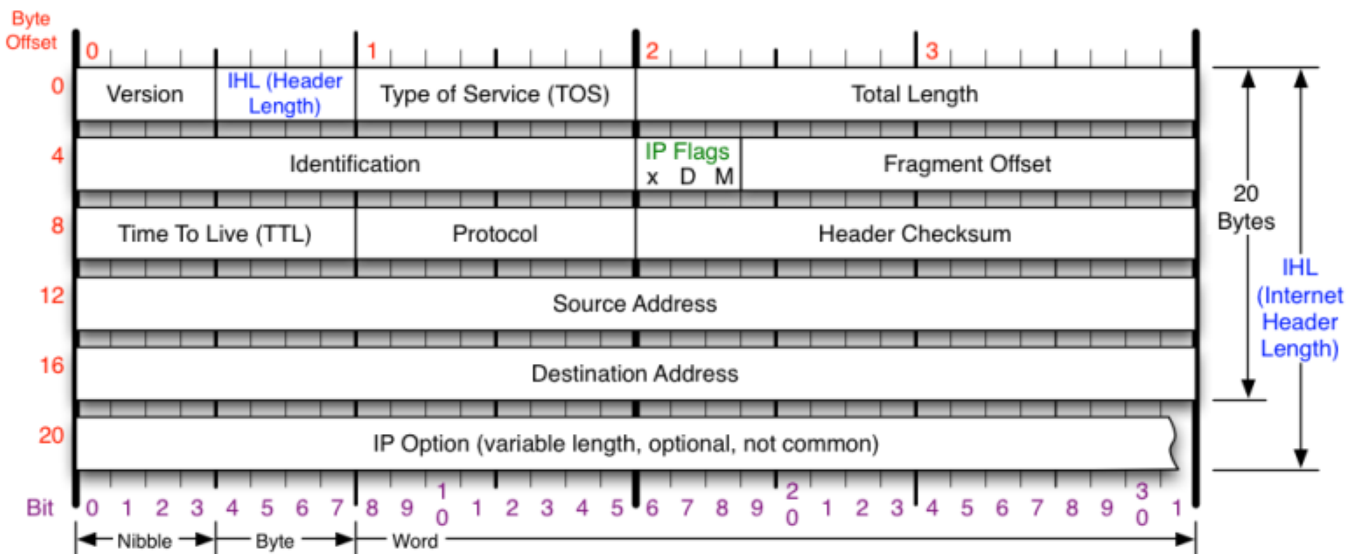
Verifica di Sistemi su TCP e UDP

Domande in preparazione del compito

- Cos'è e come funziona il protocollo UDP? A che livello ISO/OSI è?
- Descrivi l'header UDP e i suoi principali campi

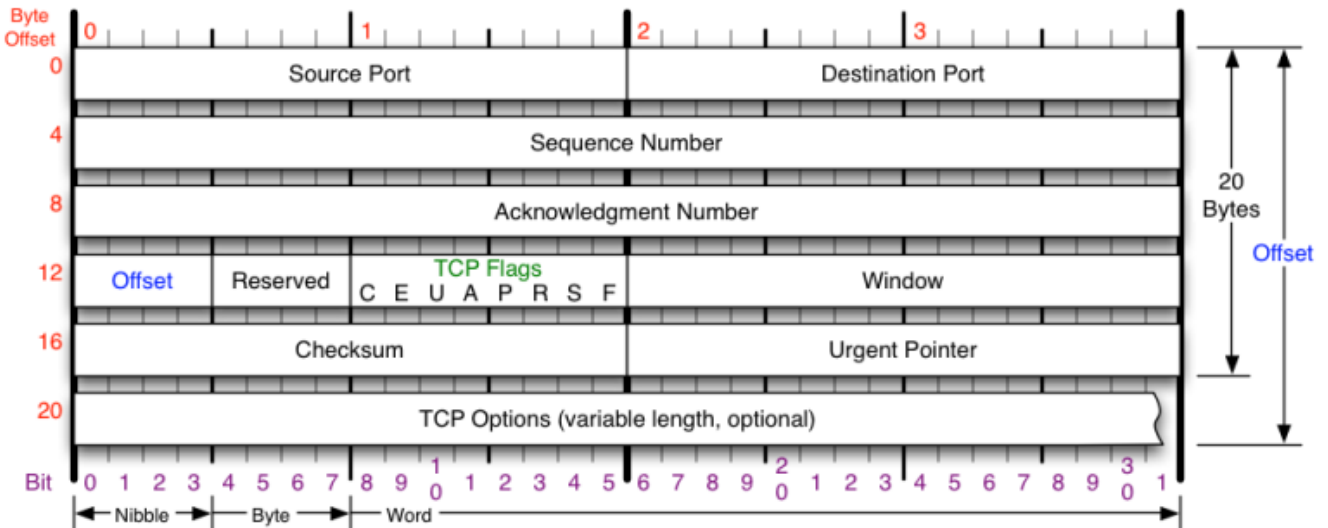


- Descrivi i campi principali dell'header del protocollo IP



<p>Version</p> <p>Version of IP Protocol. 4 and 6 are valid. This diagram represents version 4 structure only.</p>	<p>Protocol</p> <p>IP Protocol ID. Including (but not limited to):</p> <table border="0"> <tr> <td>1 ICMP</td> <td>17 UDP</td> <td>57 SKIP</td> </tr> <tr> <td>2 IGMP</td> <td>47 GRE</td> <td>88 EIGRP</td> </tr> <tr> <td>6 TCP</td> <td>50 ESP</td> <td>89 OSPF</td> </tr> <tr> <td>9 IGRP</td> <td>51 AH</td> <td>115 L2TP</td> </tr> </table>	1 ICMP	17 UDP	57 SKIP	2 IGMP	47 GRE	88 EIGRP	6 TCP	50 ESP	89 OSPF	9 IGRP	51 AH	115 L2TP	<p>Fragment Offset</p> <p>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.</p>	<p>IP Flags</p> <table border="0"> <tr> <td>x</td> <td>D</td> <td>M</td> </tr> </table> <p>x 0x80 reserved (evil bit) D 0x40 Do Not Fragment M 0x20 More Fragments follow</p>	x	D	M
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<p>Header Length</p> <p>Number of 32-bit words in TCP header, minimum value of 5. Multiply by 4 to get byte count.</p>	<p>Total Length</p> <p>Total length of IP datagram, or IP fragment if fragmented. Measured in Bytes.</p>	<p>Header Checksum</p> <p>Checksum of entire IP header</p>	<p>RFC 791</p> <p>Please refer to RFC 791 for the complete Internet Protocol (IP) Specification.</p>															

- Immagina di avere una comunicazione UDP. Come useresti e che scriveresti nei due header di UDP e IP? Quali flag useresti?
- Supponendo di avere uno streaming video di un file di 40MB in tempo reale e di avere a disposizione una connessione di al massimo 100kB al secondo per la trasmissione dei pacchetti UDP, quale è la massima lunghezza in minuti e secondi del video perché si riesca a visualizzare correttamente?
- Quali sono le caratteristiche del protocollo TCP?
- Descrivi l'header del protocollo TCP



TCP Flags	Congestion Notification	TCP Options	Offset																															
C E U A P R S F	ECN (Explicit Congestion Notification). See RFC 3168 for full details, valid states below.	0 End of Options List 1 No Operation (NOP, Pad) 2 Maximum segment size 3 Window Scale 4 Selective ACK ok 8 Timestamp	Number of 32-bit words in TCP header, minimum value of 5. Multiply by 4 to get byte count.																															
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	<table border="1"> <thead> <tr> <th>Packet State</th> <th>DSB</th> <th>ECN bits</th> </tr> </thead> <tbody> <tr> <td>Syn</td> <td>00</td> <td>11</td> </tr> <tr> <td>Syn-Ack</td> <td>00</td> <td>01</td> </tr> <tr> <td>Ack</td> <td>01</td> <td>00</td> </tr> <tr> <td>No Congestion</td> <td>01</td> <td>00</td> </tr> <tr> <td>No Congestion</td> <td>10</td> <td>00</td> </tr> <tr> <td>Congestion</td> <td>11</td> <td>00</td> </tr> <tr> <td>Receiver Response</td> <td>11</td> <td>01</td> </tr> <tr> <td>Sender Response</td> <td>11</td> <td>11</td> </tr> </tbody> </table>	Packet State	DSB	ECN bits	Syn	00	11	Syn-Ack	00	01	Ack	01	00	No Congestion	01	00	No Congestion	10	00	Congestion	11	00	Receiver Response	11	01	Sender Response	11	11	<table border="1"> <thead> <tr> <th>Checksum</th> </tr> </thead> <tbody> <tr> <td>Checksum of entire TCP segment and pseudo header (parts of IP header)</td> </tr> </tbody> </table>	Checksum	Checksum of entire TCP segment and pseudo header (parts of IP header)	<table border="1"> <thead> <tr> <th>RFC 793</th> </tr> </thead> <tbody> <tr> <td>Please refer to RFC 793 for the complete Transmission Control Protocol (TCP) Specification.</td> </tr> </tbody> </table>	RFC 793	Please refer to RFC 793 for the complete Transmission Control Protocol (TCP) Specification.
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- Cos'è e come funziona una connessione 3 way handshake? Perché ci sono 3 messaggi e cosa succede se un messaggio non viene ricevuto?
- Come funziona uno scambio di pacchetti in TCP una volta stabilita la connessione? (ACK)
- Cos'è una finestra nel protocollo TCP?
- Avendo una rete ethernet a 10Mbps e volendo trasferire un file da 1GB, quanto tempo impiego con TCP? Potrei usare UDP? Cosa cambia?
- Cos'è una MTU? Fai un esempio.
- Cos'è il payload? Fai un esempio.
- Cos'è il MSS? Fai un esempio.
- Cos'è un socket? Fai un esempio.