# Le protocole TCP

- TCP (Transmission Control Protocol), RFC 793 (1981)
- Notion de port dédié (ex: HTTP/80) et de multiplexage
- Notion de connexion
  - contrôle d'erreur
  - contrôle de flux
  - contrôle de congestion
  - numéro de séquence unique pour chaque segment TCP
- Notion de drapeaux ( SYN, ACK, RST, FIN…)

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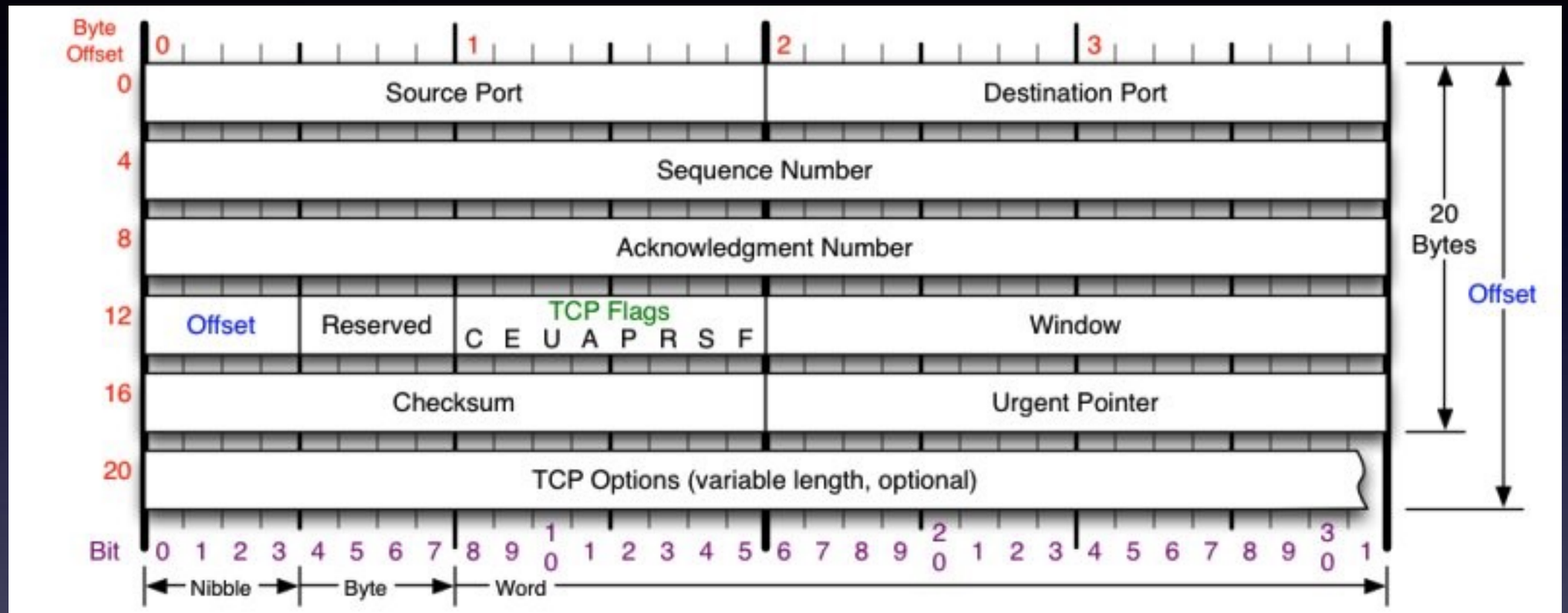


**TCP Flags**

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.