

# Transmission Control Protocol

## User Datagram Protocol

### Portnummern

0 - 1023	Well Known Ports	Server applications (FTP: 20, 21, Telnet: 23, SMTP: 25, DNS: 53, HTTP:80, POP 110)
1024 - 49151	Registered Ports	user processes or applications, clients
409152 - 65535	Dynamic or Private Ports	client applications

<http://www.iana.org/assignments/port-numbers>

### UDP

- No connection establishment: connectionless
- Applications: DNS(53), TFTP (69), Streaming Video, VoiceOverIP
- wenig Overhead: 8 Byte Header

### UDP-Header

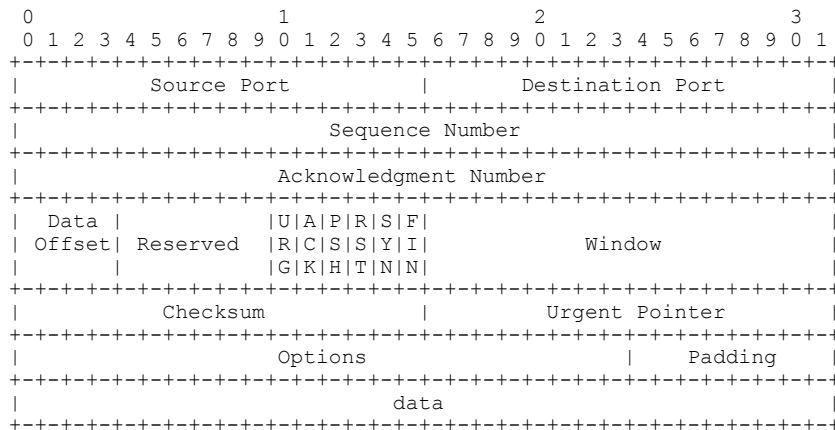
RFC 768

0	7 8	15 16	23 24	31
Source Port		Destination Port		
Length		Checksum		

# TCP

## TCP-Header

RFC 793

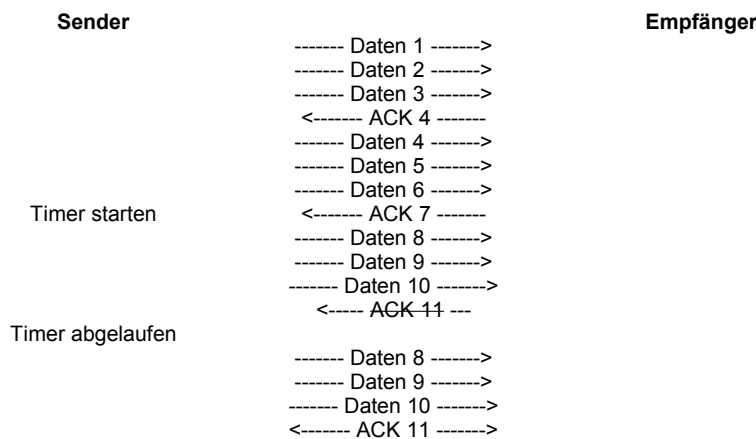


### Ordered Delivery (Segment Reassembly)

Empfänger ordnet Segmente anhand der **Sequence-Number**

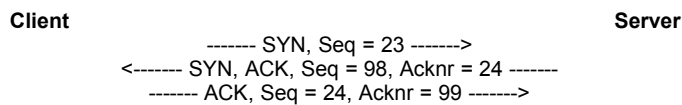
### Reliability (Zuverlässigkeit)

(Zuverlässigkeit): acknowledgements (receiver), timer + retransmission (sender)



### Connection Establishment (Three-Way-Handshake)

Connection-oriented: Verbindungsaufbau: Austausch der **initial sequence number**



### Flow Control

(Flusskontrolle, Stauvermeidung): sliding windows

**Window-size:** Datenmenge in Byte, die empfangen wird, bevor Acknowledgement geschickt wird

### Error Checking

### Overhead

20 Byte Header, Three-way-handshake, ACK

### Applications

FTP (20, 21), Telnet (23), SMTP (25), DNS(53), HTTP (80)

### Übungen

- Windows-tool: **netstat**
- Packet-Tracer