

## Lecture 8: The Internet Service model and the Transport Layer

reading 2.1.4 - transport services provided by the internet  
3.1-3.4 transport layer up to but not including reliability

homework 2 is due monday 2 pm

## layered protocol model / protocol stack

Application

socket() - payload (data), remote host address, port  
(local address, local port)

Transport

down: payload (data+transport header), address

Network

## Best effort service (network layer)

delay / latency - jitter

throughput

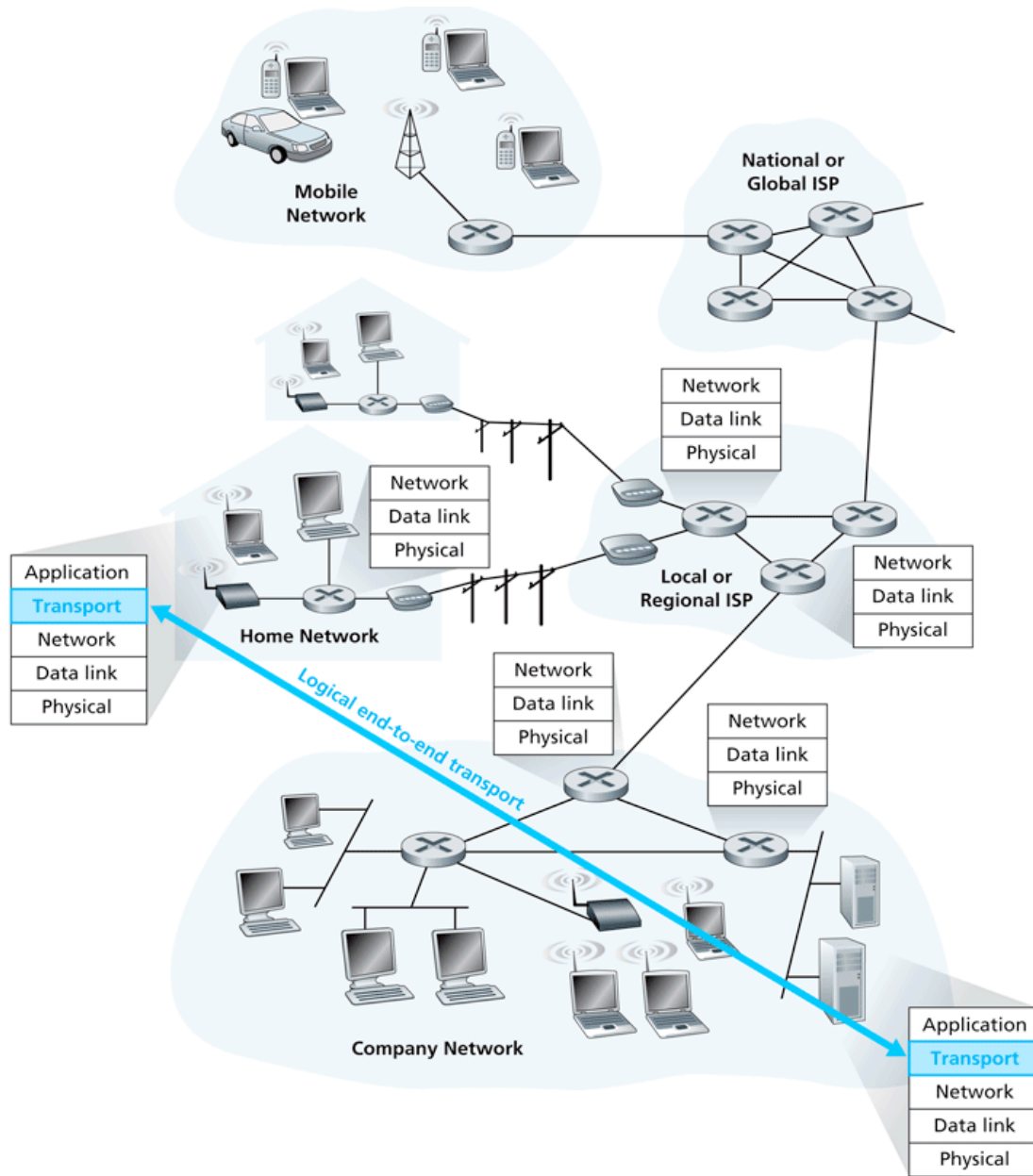
packet loss - congestion related packet losses

packet loss - transmission errors, cosmic radiation

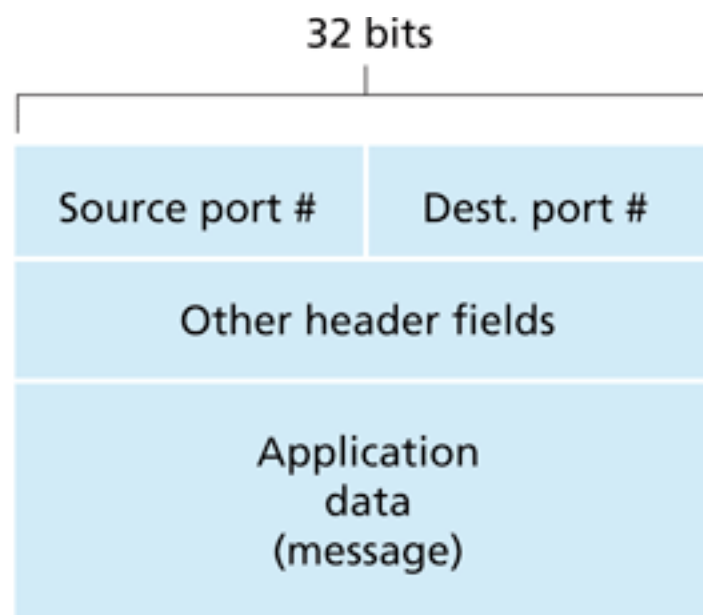
privacy

packet order guarantees

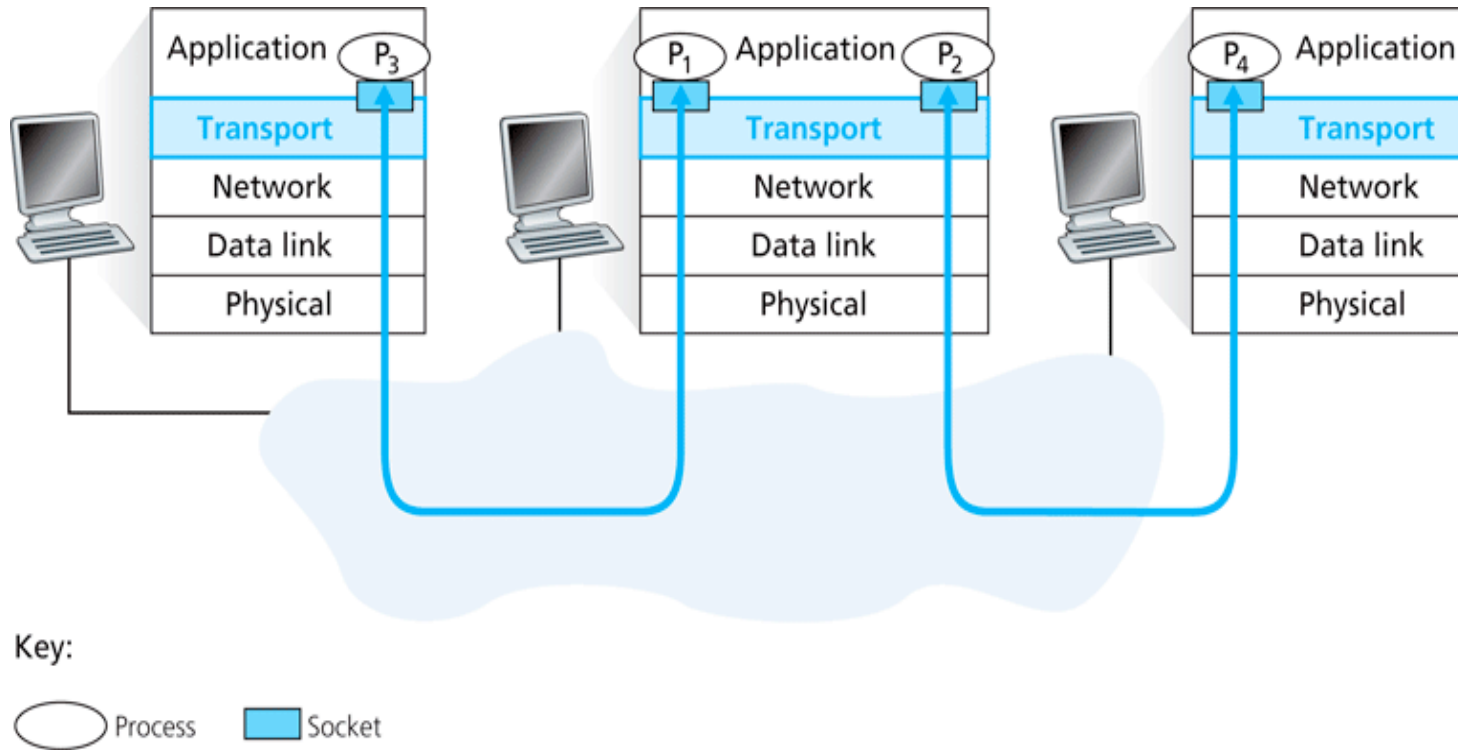
data corruption / integrity



**Figure 3.1** ♦ The transport layer provides logical rather than physical communication between application processes.

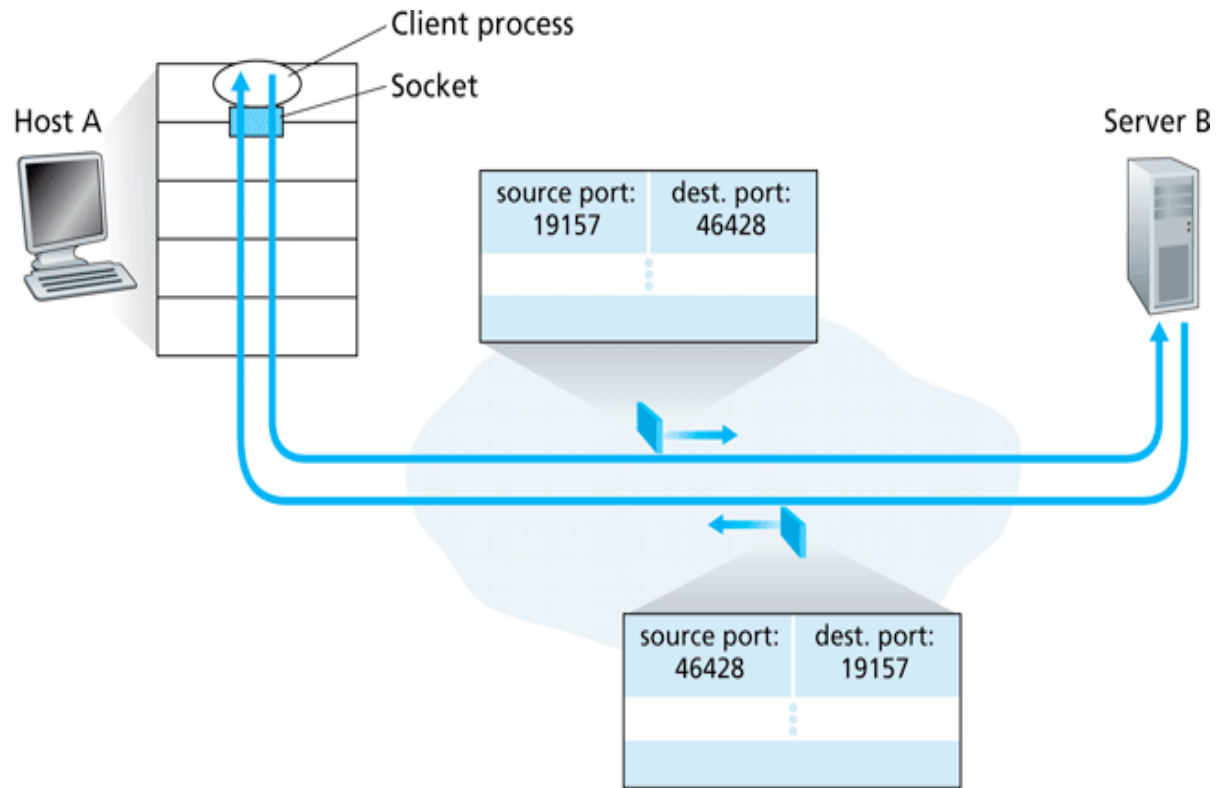


**Figure 3.3** ♦ Source and destination port-number fields in a transport-layer segment

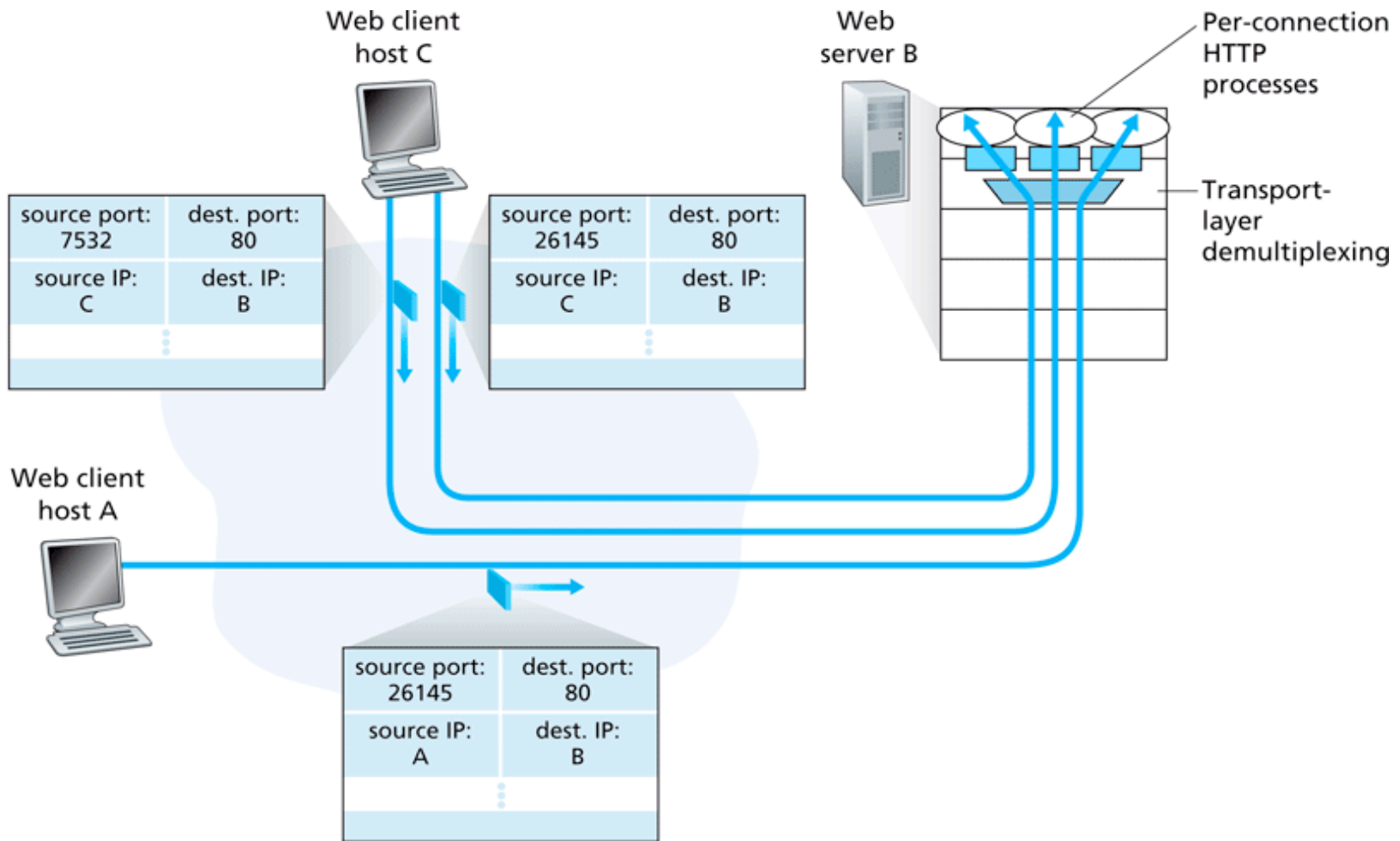


**Figure 3.2** ♦ Transport-layer multiplexing and demultiplexing

(source address, dest address, dest port, src port)



**Figure 3.4** ♦ The inversion of source and destination port numbers

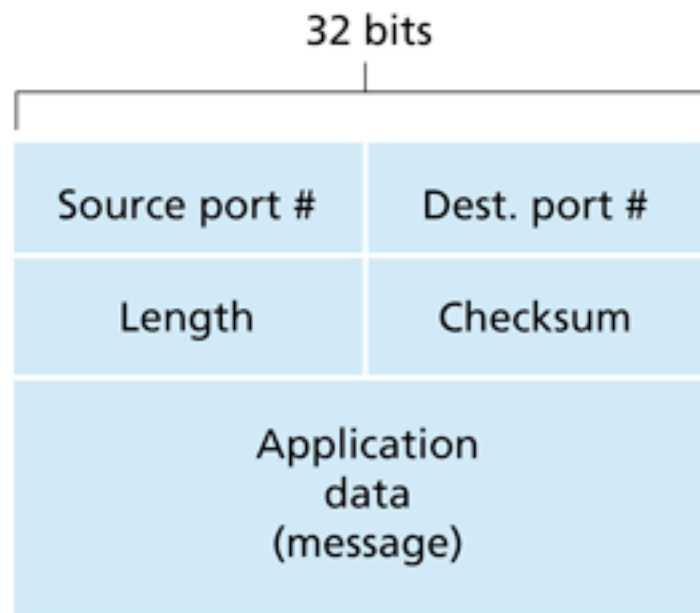


**Figure 3.5** ♦ Two clients, using the same destination port number (80) to communicate with the same Web server application



# Ethernet - Token Ring - ATM

end-to-end principle: do as much as possible at the edges



**Figure 3.7** ♦ UDP segment structure

```
          00110101
          00001101
sum:     01000011
          11001101
cksum: 00010000
1's comp: 11101111
sum: 11111111
```