CSc 450/550
Computer Networks
User Datagram Protocol

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User Datagram Protocol

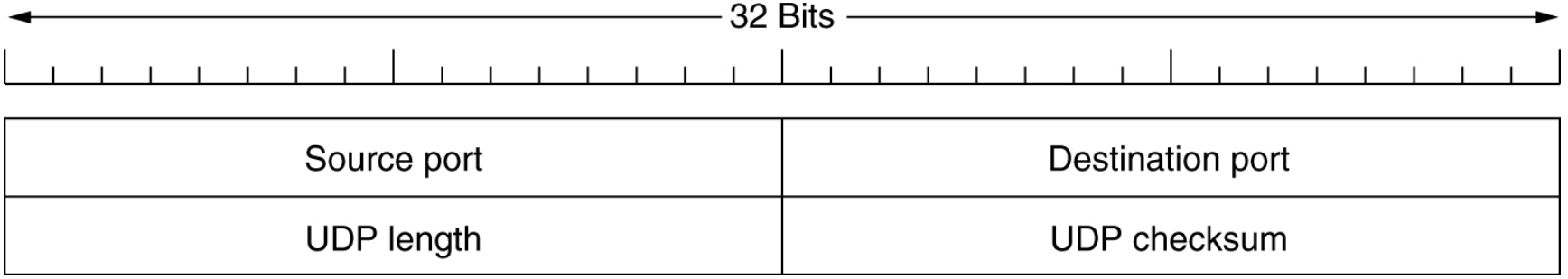
- Service provided by UDP
  - connectionless
    - no connection management
  - unreliable
    - no flow, error, congestion control
- Service provided by IP
  - connectionless, best-effort packet delivery
- Why UDP?

Why UDP?

- Sometimes TCP is an overkill
  - TCP is an all-in-one package
    - connection management
    - flow, error and congestion control
- Not all applications need TCP
  - e.g., voice over IP
    - loss tolerable to a certain degree, delay sensitive
- Why not just IP?
  - transport-layer multiplexing

UDP header

- Multiplex
  - source/destination port number
- Error checking (optional)
  - checksum (TCP/IP-style)
- Why “UDP length”?



Internet checksum

- Used in TCP checksum
  - including TCP pseudo header
- Optionally used in UDP checksum
- also used in IP header checksum
- Checksum generation
  - 16-bit aligned, one's complement sum with carry
    - most significant carry bit wrapping around
  - “one's complement of one's complement sum”
- Checksum verification

Cast study: UDP vs TCP

- DNS queries mostly on UDP
  - DNS servers also respond to queries on TCP
- HTTP transactions mostly on TCP
  - also there is HTTP over UDP
- How to choose UDP vs TCP
  - application requirements
  - protocol features
  - application functions

Review: TCP

- Packet header
- Connection management
- Flow control
- Error control
- Congestion control
- TCP variants

This lecture

- UDP
  - multiplexing
  - checksum
- Review on TCP
- Explore further
  - CSc 461 (multimedia), CSc 462 (distributed), Topics (advanced networks, mobile computing) and many more systems courses at UVic CS

Next lectures

- June 28: 2nd in-class midterm exam
  - June 27: extra before-exam office hours
  - regular office hours: MR
  - use the google group: get help and help others
- July 5: IP/ICMP
  - July 6: P2 due and P3 out
- July 9/12: Routing algorithms and protocols