

Name ..... ID ..... Section ..... Seat No .....

# Sirindhorn International Institute of Technology Thammasat University

**Final Exam: Semester 2, 2010**

**Course Title:** ITS413 Internet Technologies and Applications

**Instructor:** Steven Gordon

**Date/Time:** Wednesday 9 March 2011; 13:30–16:30

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**Instructions:**

- This examination paper has 19 pages (including this page).
- Conditions of Examination: Closed book; No dictionary; Non-programmable calculator is allowed
- Students are not allowed to be out of the exam room during examination. Going to the restroom may result in score deduction.
- Students are not allowed to have communication devices (e.g. mobile phone) in their possession.
- Write your name, student ID, section, and seat number clearly on the front page of the exam, and on any separate sheets (if they exist).
- The space on the back of each page can be used if necessary.
- Reference material at the end of the exam may be used.

## ITS413 Final Exam Hints

- 6 questions, each with multiple parts (some with 10+ parts)
- 100 marks total
- Covering topics from after midterm
  - TCP: congestion control and performance
  - QoS
  - Multicast
  - Multimedia: Voice, Streaming, IPTV
  - P2P: Napster, Gnutella, Fasttrack, DHT
  - BitTorrent
- Calculate is allowed, and may be needed by some students
- Most questions are about concepts and algorithms, with some calculation questions
- DO NOT need to remember all details of packet headers, codecs, protocol messages, file formats, detailed equations/algorithms for TCP, ...
- Packet headers are given as reference material (see next page)

## Reference Material

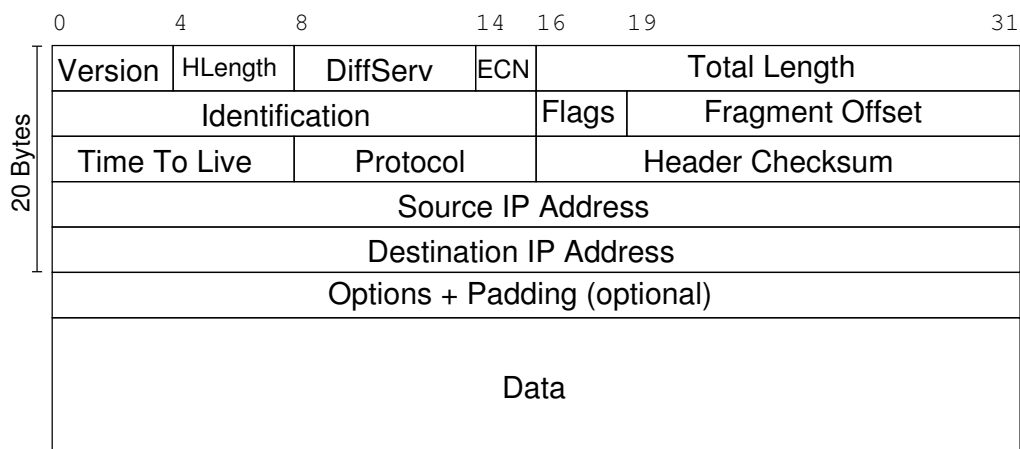


Figure 1: IP Datagram Format. Flags: Reserved, Don't Fragment, More Fragments

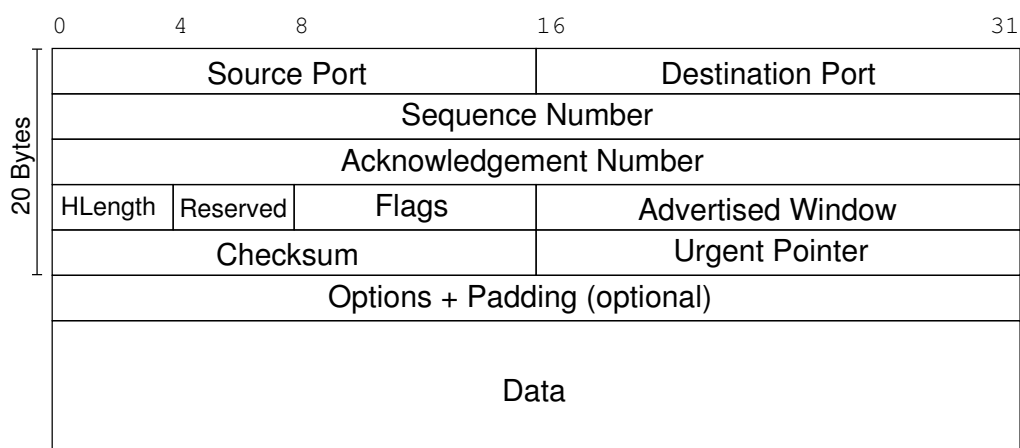


Figure 2: TCP Segment Format. Flags: CWR, ECE, URG, ACK, PSH, RST, SYN, FIN

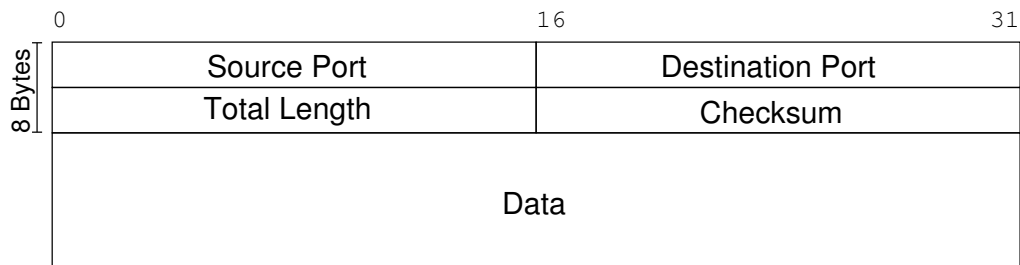


Figure 3: UDP Datagram Format

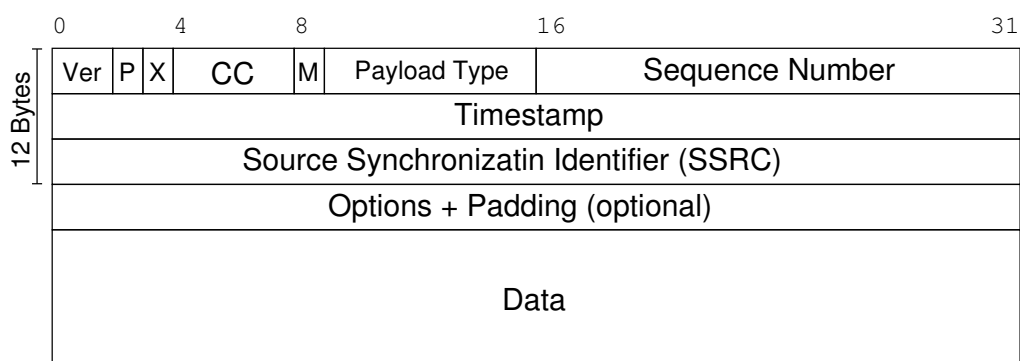


Figure 4: RTP Packet Format. P: Padding; X: Extension; CC: CSRC count; M: Marker