PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Examination Semester 2:   Academic Year : 2007

Date : 25 December 2007   Time : 13.30 – 16.30

Subject : 240-544 Telecom., Wireless and Mobile Networking   Room : หัวหุ่น

Instruction:

- Make sure that there are 7 questions (100 points) in your exam paper.
- This exam is closed book and you have 3 hours to complete your exam.
- All of your answers can be written in either Thai or English.
- **Dictionary are allowed.**
- Palm pilots or other hand held computers are not allowed.

1. Answer the following questions

    1a) Explain why most commonly used (Layer 4) Internet protocols, such as UDI or TCP, are not suitable to transport SS7 signaling within IP networks and inter-working with other networks. Also, give the name of the transpor protocol over IP protocol recommended by the IETF Sigtrans working group

    [10 points]

    1b) If you have to design a voice-over-IP system that allows inter-networking signaling between voice services in traditional public switched telephone network (PSTN) and IP network, explain the concept of your design especially details of functional units that reside at the telephone gateway.

    [10 points]

2. How is the "Soft handover" done in WCDMA or UMTS network? Compare its benefit against "Hard handover" found in analog cellular networks.

    [8 points]

3. From the 3GPP Release 5 (and beyond) network architecture given in Figure 1, explain the key role of IP Multimedia System (IMS).   [8 points]
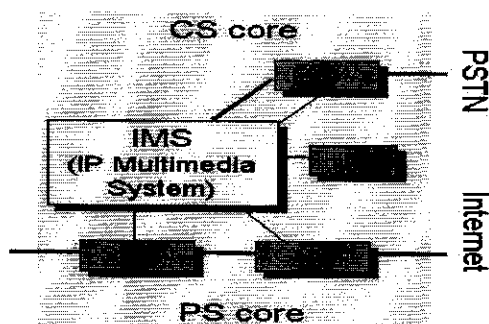

Figure 1 For question 4

4. QoS Enhancement Standard in Wireless LANs

4.1 In the IEEE 802.11 network, explain why the time-bounded services using PC?
(Point Coordination Function) mode is considered having QoS limitation.
[3 points]

4.2. In the IEEE 802.11e, describe how Enhanced Distributed Coordinatio 1
Function (EDCF) for the contention period can <u>provide service differentiatio 1</u>
(or relative priority classes). Also, use brief diagrams to support you r
explanation
[7 points]

5. Bluetooth & RFID

5.1 Bluetooth networks organize themselves into small cells called piconet: .
Explain how the technique of Frequency Hopping Spread Sprectrum (FHSS)
can help Bluetooth to deal with interference between several different piconel 3
that are within range of each other?
[10 points

5.2 Explain the key feature that make two basic types of RFID Tags (i.e. Passiv 3
and Active Tags) become different
[5 points]

5.3 Give reasons that make RFID Technology has benefits over that of Bar Code 3
[5 points]

6. In Mobile IP, explain the situation that may cause an inefficient triangular routin 3
scheme and suggest possible solutions
[10 points

7. Micromobility and Fast Handoff

7.1 Explain two major drawbacks of Mobile IP that micromobility technique aim 3
to alleviate.
[4 points]

7.2 Give the architecture of hierachical Mobile IP and describe how it ca 1
alleviate the weaknesses of Mobile IP mentioned in 7.1 above
[10 points

7.3 Given the architecture of Cellular IP, which is a Host-Based Routing Scheme,
in the figure 2 below, describe how it can reduce network overhead load a 3
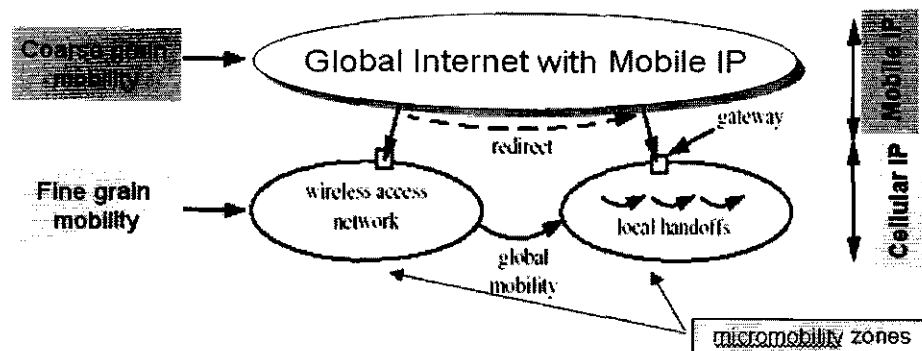greater numbers of users have mobile and wearable devices
[10 points

Figure 2 For question 7.3