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Semester Exam - 2023, Class: B.Tech. (IT) VII semester
Subject: Wireless & Mobile Computing (CS-17102) Reg.No:
Note: attempt all questions.
Time: 3H M.M: 60

1: An institute campus has a hostel. The hostel has 4 wings (w1, w2, w3, w4). Each wing has 8 rooms. Room numbers are r1, r2 ... r32. Each room needs one Wi-Fi connection. Single AP can connect maximum 8 stations and has routing capabilities. All AP's are connected to a layer 3 switch (rs1). The switch rs1 is placed between wing w2 and wing w3. The rs1 switch is connected to another layer three switch rs2 placed in the campus at a distance of approximately 1 Km. Switch rs2 is connected to a gateway router (rg) which is connected to rest of the Internet through ISP router. IP address block assigned for the Institute is 202.141.80.0/24.

i) Design a campus wide Wi-Fi solution so that the hostel rooms can be connected to rest of the Internet. Specify topology, AP'S, channels of AP'S and connected nodes, cables type, switchs ports type, routing table entries of layer three switches & ISP router. Each wing requires separate subnet. You should tell how many maximum IP addresses are sufficient for each wing, with subnet IP addresses with netmask. Give IP address of rooms.

ii) A node (CN) having IP 202.141.64.10/24 connect to a mobile node (MN) having IP 202.141.96.10/24 with HA address as 202.141.96.1/24. MN has moved to room number r1 of wing w1 of the hostel while connected to the CN. Show the changes inside the network and delivery of the packet p1 from CN to MN and of packet p2 from MN to CN use mobile IP (MIP).

MN moves to room number r25 situated in wing w4. Show the changes inside the network and delivery of packet p3 from CN to MN and packet p4 from MN to CN use HMIP. State any assumption taken.

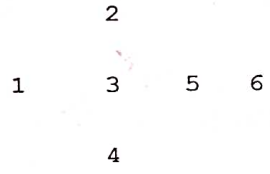
iii) Design a solution for above campus using CISCO CAPWAP [15+10+5=30]

2: consider I-TCP and show delivery of a packet P to a mobile node (MN) from a corresponding node (CN) and from MN to CN. Assume mobile node is in foreign network and registered. [6]

3: In 3G Explain HLR, VLR and compare them with HSS, MME in 4G/5G? Discuss architecture of 4G/5G with respect to control plane and data plane. [7]

4: Consider 4G/5G mobility management, A mobile terminal (MT) is attached to base station (BS1). Mobile terminal (MT) is getting signal from another base station (BS2). When handoff of mobile terminal (MT) may take place to base station (BS2)? How the handoff will take place when BS1 and BS2 are served by same S-GW under same MME. Show incoming and outgoing packets at P-GW, S-GW. [7]

5: consider following nodes of MANET and routing protocol AODV:



Node 2, 3, 4 are in range of 1. Node 5 is in range of 3 and 6. Node 3 is in range of 2 and 4. Links are symmetrical. Node 1 sends RREQ (fields:s.add,d.add,s.seq,d.seq,hc) packet p1 for route discovery to node 6, with destination sequence no = 6_10 (10 for node 6) and id = 5. Show following:

i) How p1 reaches to destination 6. show fields at each node.

ii) Route establishment from 1 to 6. What will be destination sequence number in RREP packet?

iii) Which nodes will now have route to 6.

If 5 moves out of range of 3 and goes in the range of 2 how route maintenance takes place and establish new route. What will be destination sequence number in RREQ packet and RREP packets? [10]