Important Instructions:

1) **Open this MS-Word document and start writing answers below each respective question given on page 2.**
2) **Answers the question in the same sequence in which they appear.**
3) **Provide to the point and concrete answers.**
4) **First read the questions and understand what is required of you before writing the answer.**
5) **Attempt the paper yourself and do not copy from your friends or the Internet. Students with exactly similar answers or copy paste from the Internet will not get any marks for their assignment.**
6) **You can contact me for help if you have any doubt in the above instructions or the assignment questions.**
7) **All questions must be attempted.**
8) **Do not forget to write your name, university ID, class and section information.**
9) **Rename you answer file with your university ID# before uploading to SIC.**
10) **When you are finished with writing your answers and are ready to submit your answer, convert it to PDF (no MS Word) and upload it to SIC unzipped, before the deadline mentioned on SIC.**
11) **Do not make any changes to the format provided.**
12) **Failure in following the above instructions might result in deduction of marks.**

Sessional Assignment, Course: - Mobile Computing

Deadline: - Mentioned on SIC **Marks: - 20**

Program: - BS (CS), BS-SE **Dated: 11 April 2020**

Related Course: Lecture 7 and 8.

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Class and Section: BS (SE-8) Section A

Q1: In what aspects is an Adhoc network different from infrastructure networks? (3)

Answer:

- Ad-hoc networks don't need a centralized access point, as devices on the wireless network connect on to one another. While Infrastructure mode requires a central access point to connect all devices.
- Ad-hoc mode may be easier to set up if you simply wish to connect 2 devices to each other while not requiring a centralized access point. While Infrastructure mode is ideal if you're setting up a more permanent network. Wireless routers generally have higher-power wireless radios and antennas to function as access points so that they can cover a wider area.
- Let's say you have two laptops and you're sitting in a room without Wi-Fi, they can be connected directly with ad-hoc mode to form a temporary Wi-Fi network without needing a router. While in infrastructure if you're using a laptop to set up a wireless network, you'll be limited by the power of the laptop's wireless radio, which won't be as strong as a router's.
- Ad-hoc mode needs additional system resources because the physical network layout can modify as devices move around, whereas an access point in infrastructure mode typically remains stationary.

Q2: What is the difference between reactive and proactive routing protocols in MANETS? (3)

Answer:

- **Reactive Routing Protocols:** In reactive routing protocols, if a source node desires to send a packet to destination node, foremost the route to the destination node is decided then an affiliation is established between these nodes. For route determination, route request packets are sent throughout the network. Flooding is utilized as a reliable

methodology of spreading data over the network, but it uses bandwidth and creates network overhead, reactive routing broadcasts routing requests whenever a packet desires routing, this might cause delays in packet transmission as routes are calculated, however options little management traffic overhead and has generally lower memory usage than proactive routing protocol, this increase the measurability of the protocol.

- **Proactive Routing Protocols:** In this protocol each node maintains one or a lot of tables representing the complete topology of the network. These tables area unit updated often so as to keep up-to-date routing data from every node to each different node. To keep up the up-to-date routing data, topology data has to be changed between the nodes on a daily basis, resulting in comparatively high overhead on the network. One the opposite hand, routes can invariably be available on request. A proactive approach for routing seeks to keep up a perpetually updated topology understanding. The complete network should be known to any or all nodes. This ends up in a continuing overhead of routing traffic, however no initial delay in communication.

Q3: Differentiate between regular and MPR flooding? (2)

Answer:

- **Regular Flooding:** A regular flooding mechanism is often as straightforward as: once a packet is flooded, every node within the network repeats this packet the first time it receives it. This way, ranging from the source of the packet, every node within the element connected to the source can receive the packet a minimum of once (but usually multiple times). Many existing techniques optimize a flooding method by reducing the amount of repeaters however still guaranteeing that every node within the network receives a flooded packet a minimum of once, so saving valuable bandwidth.
- **MPR Flooding:** Multi-Point Relay (MPR) is one among the foremost widespread optimization, having every node choose a marginal set of "relay nodes" (called MPRs), liable for relaying flooded packets. Additionally of guaranteeing that the amount of repeaters is drastically reduced, whereas flooding still covers every node within the network, MPRs have another fascinating property within the context of link state routing, send information of the links from every node to its neighbors that for which "necessary" and is decent so as to figure the shortest ways network-wide, as if the data of each link within the network was accessible. This property allows a forceful reduction within the quantity of link state that must be signaled, whereas still guaranteeing optimum connectivity.

Q4: On which path is the route reply message sent in DSR? (3)

Answer: Route Reply is generated if the message has reached the supposed destination node (route record that is at first contained in Route Request would be inserted into the Route Reply). To return the Route Reply, the destination node should have a route to the source node. If the route is within the Destination Node's route cache, the route would be used. Otherwise, the node can reverse the route based on the route record inside the Route Request message header.

Q5: What is source routing? (2)

Answer:

- **Source routing:** It's a particular routing method where senders will specify the route that information packets take through a network. This enables for troubleshooting and varied transmission goals. Source routing is another to traditional routing where packets simply move through a network based on their destination. Source routing is additionally called path addressing.
- **Types of source routing:** There are 2 differing kinds of source routing – loose and strict. In loose source routing, the packet should go through specific listed hops, however in strict source routing, the sender specifies each step on a hop-by-hop basis. While there are some uses for source routing that consultants would term legitimate, like clearly parturition out transmission trajectories, there also are uses that might be helpful to hackers in smurfing or connected attacks. Though source routing is usually not required, it's an alternate for senders to determine specific broadcast goals.

Q6: If AODV does not store route information in the packet then how does the routing works? (4)

Answer: Every route table entry at each node should embody the most recent info available regarding the sequence number for the IP address of the destination node that the route table entry is maintained. This sequence number is termed the "destination sequence number". It's updated whenever a node receives new information relating to the sequence number from RREQ, RREP, or RERR a message which is able to be received associated with that destination AODV depends on every node within the network to have and maintain its destination sequence number to ensure the loop-freedom of all routes towards that node. so as to establish that info about a destination isn't stale, the node compares its current numerical value for the sequence number therewith obtained from the incoming AODV message. If the result of subtracting the presently hold on sequence number from the value of the incoming sequence number is a smaller value than zero, then the information associated with that destination within the AODV message is discarded, since that data is stale compared to the node's presently hold on data.

Q7. What are the functions of sequence numbers in AODV? (3)

Answer: Sequence numbers function is to find out an up-to-date path to a destination. Each entry within the routing table is related to a sequence number. The sequence number act as a route timestamp, guaranteeing freshness of the route. Upon receiving a RREQ packet, an intermediate node compares its sequence number with the sequence number within the RREQ packet. If the sequence number already registered is bigger than that within the packet, the prevailing route is updated.