
Final Exam, Course: - Mobile Computing

Deadline: - Mentioned on SIC

Marks: - 50

Program: - BS (CS), BS-SE

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Q1: Provide the names of 4 challenges that exist in Adhoc Networks.

Ans#1:

Challenges in Ad hoc Network:

1. Infrastructure-less design:

- Infrastructure Ad hoc network are used to detect faults and adds difficulty in fault and perform its management.

2. Dynamic topology :

- Dynamic topology are used to change the path and also helpful in packet loss.

3. Scalability:

- Scalability are still unsolved challenges which include different operation like interoperability, routing, configuration management, addressing.

4. Energy limits:

- If the system have limits processing power so the ad hoc energy limits are used to perform as a router on each and every node.

Q2: How the nodes in the Adhoc Network know about the changing network topology?

Ans#2 :

- New nodes announce their existence and listen to broadcast announcements by their neighbors.

- Each node learns about other people nearby and how to reach them, and may announce that it can also reach them.

Q3: Why is it important to minimize flooding of control packets in Adhoc Networks and how MPR achieves it?

Ans#3:

Importance:

- **Reduce control packet size:**
 - Its gives information about only those links which are neighbors with it and also select multipoint relay selector set.
- If we reduce the duplicate transmission so the number of control packets are also reduce. If we want to reduce flooding we used a few node relay points to send information.

Multipoint Relay minimizes:

- MPR are used to minimize the flooding of broadcast packets in the network by minimizing the number of duplicate retransmission of data in the same location.

Q4: Explain briefly how Mobile Cloud Computing is different than simple mobile computing and simple cloud computing?

Ans#4:

Mobile Cloud Computing:

- Mobile cloud computing is combination of mobile and cloud computing to make the a lot of computational resources to mobile and laptops users, network operators and also the company which provides computing. The main goals of Mobile cloud computing is to enables execution of rich mobile applications.
- **Mobile cloud computing = Mobile computing + Cloud computing.**

Cloud Computing:

- It is used to store and access data through internet instead of storing on computer hard disk. Storage of data in hard drive it is called local computing.

Mobile Computing:

- Mobile computing is a technology which are used for transmission of data, voice, video and audio by using wireless devices like mobile phones, laptops having no coaction with any types of physical links.

Q5: Explain the term MBaaS in your own words?

Ans#5:

MBaaS:

- Mobile Backend as a server provide for both web as well as mobile app developer which provide the platform for the developer to store their data and also connect their applications and data to Backend cloud server for processing. MBaaS provide some common functionality like user management, social networking integration, notification, API endpoint, cloud storage, Database management and much more features that mobile users have to demand in their daily life.

Q6: Imaging you visit a completely new city. What kind of services a modern LBS can provide you at your location automatically?

Ans#6:

Location based services (LBS):

- LBS are provide services offered through a mobile phone and take into account devices geographical location. LBS provide information and entertainment.it mainly depend on the user of mobile phone and also it location. The techniques which we are provide to a user which identify the location automatically.
- Now to locate our location automatically so we used Global Positioning System (GPS) Because it is a satellite based locator or navigation based technique mean the GPS cover all over the world by making three satellite with 120⁰ and communicate with each. So if we visit a completely new city we used GPS LBS system for location automation. Which navigate the location to the user and user can feel relx and have no problem to find the location by asking or used any other source.

Q7: Use your imagination as to how the following context can be used by a context aware application in mobile computing environment?

Ans#7:

Date/Time:

- According to the context aware systems the date and time for the user should be provided by the system on his current location and provide user a option to change date and time according to his area of living it should be displayed on the screen by design made of user centric approach

Environment:

- The environment is key factor in the context aware systems the system should focus on the how the system will react at the environment change for example in the noisy area or at night time or at daylight what's will be behaviors in different conditions for that there is option in phone to adjust brightness , screen density warm or cold.

Emotional state:

- According to context aware systems emotional state of user can effect mobile computing environment for example A loud alert is not ideal for all situations. In the same way language change ,color should be according to the user .

Focus of attention:

- The system should give importance to the attentions of user. Through context aware systems the can provide some services like in the phone call Avoid unnecessary interruption or when the message arrive on the Phone flashes a notification every 30 seconds Eventually the user will ignore it!

Orientation:

- Orientation means the context aware system have capability to provide users device to adjust the screen in every change for example auto rotate mode in Smartphone to adjusts the screen to the orientation of the device ,Apple Watch turns on display if arm lifted/rotated.

User preferences:

- The context aware system maintain the user preferences by providing the user with certain options such as in the mobile phone color density control, light or dark mode in the phone wallpaper or theme change control.

Calendar (events):

- The context aware system focuses on the system time zones and global date and this way the user have the personalized calendar and keep track of the events which will occur different to different user according to his area.

Q8: Explain why energy efficiency is important in technologies like Bluetooth and ZigBEE?

(4)

Ans#8:

The ability of devices to connect quickly to each other, the energy of devices are higher in the initial stage because of full battery charge. It was found that the ZigBee 26 channel was not interrupted by other communications, while Bluetooth, with the frequency hopping approach, might face a stuck condition, thus delaying the first step of the communication process. For ZigBee only channel 26 is used. Bluetooth, because of its specific protocol, cannot avoid interference by default. We can conclude that ZigBee technology can provide valuable support for large scale energy saving sensor networks. So the energy efficiency is important in technologies to perform the better performance.

Q9: Explain briefly how you use RFID technology at INU on a daily basis when present on the campus? Do you use an active or passive tag?

(4)

Ans#9:

- RFID are work on AIDC (Automatic identification and Data Capture) techniques. AIDC method automatically identifies the objects and collect data about them. So in our university this technology is good than cards swap because this method just identify the object and mark its presence.

- In university we used ACTIVE RFID tag because active tag has both microchip and antenna which have more power and capabilities.

Q10: Explain how Wearable Computing can be employed in computer gaming? (5)

Ans#10:

There are amazing opportunities for contemporary game developers to build applications specifically designed for wearable devices that produce a very sophisticated gaming experience for users. It is known that game applications designed for usable devices have the ability to integrate built-in elements of the device such as gyroscopic motion sensors and motion tracking to serve an interactive game experience.

Q11: What kind of facilities and technologies must be present in order to call you own home a Smart Home? (5)

Ans#11:

Smart Home Technology:

- Smart home technology generally refers to any set of devices, equipment or systems connected to a shared network that can be controlled independently and remotely.

Facilities and Technologies:

- Smart Lighting.
- Smart Window.
- Access Control.
- Smart Security.
- Central Condition.
- Energy Management.
- Door Lock.