Government Women Engg College,Ajmer
B.Tech 8 Semester I Mid Term Examination – Feb 2018
Subject: MOBILE COMPUTING **Branch :IT**
Faculty Name :Ms Bhawana Maurya

Q1.Define Mobile Computing and what are the issue in mobile computing(Explain Each)

ANS.Mobile computing is human–computer interaction by which a computer is expected to be transported during normal usage, which allows for transmission of data, voice and video. Mobile computing involves mobile communication, mobile hardware, and mobile software. Communication issues include ad hoc networks and infrastructure networks as well as communication properties, protocols, data formats and concrete technologies. Hardware includes mobile devices or device components. Mobile software deals with the characteristics and requirements of mobile applications.

Mobile Computing Systems Design Issues

The following systems design issues are important in a mobile computing project:

1. Developing a durable technology architecture for today and tomorrow
2. Wireless and Fixed Wireline network design - selecting the right network components and service provider
3. Integration (or not) of the mobile applications (both client and server portion) with the Internet and web architecture
4. Capacity planning and calculating response time - both network and application processing. Please remember there are many, many network hops and several processors involved in end-to-end transaction path.
5. Data compression and bandwidth optimization considerations and tecniques
6. Total system availability design
7. Wireless security issues
8. Asset management issues

Q2.What is Mobility Management and what are the different task of Mobility Management.

ANS.Mobility management is nothing but the technique in which uninterrupted signal connectivity is maintained, when a mobile device changes location from cell Ci to Cj or from network Ni to network Nj . Following are the two important points to ensure constant connectivity:

1. Infrastructure management that connects two or more cells or networks.
2. Location management and registration management by handoff when mobile devices move from one cell to another cell.

Mobility Management is one of the major functionality of a GSM or a UMTS network. Mobile devices inform the cellular network, whenever it moves from one location area to another. Mobiles devices detects the location area codes. When a mobile finds that the location area code is different from its last update, it performs another update by sending to the network, a location update request, together with its previous location, and its Temporary Mobile Subscriber Identity (TMSI) as well. Thus a subscriber enjoys an uninterrupted access to the network. Roaming is the fundamental mobility management procedures of all cellular networks. Roaming is referred as the ability for a customer to automatically make and receive voice calls, send and receive data, or

access other services, including home data services, when travelling outside the geographical coverage area of the home network, by means of using a visited network. This can be possible by using a communication terminal. Roaming is always technically supported by mobility management, authentication, authorization as well as billing procedures.

The technique of mobility management is as shown in following diagram:

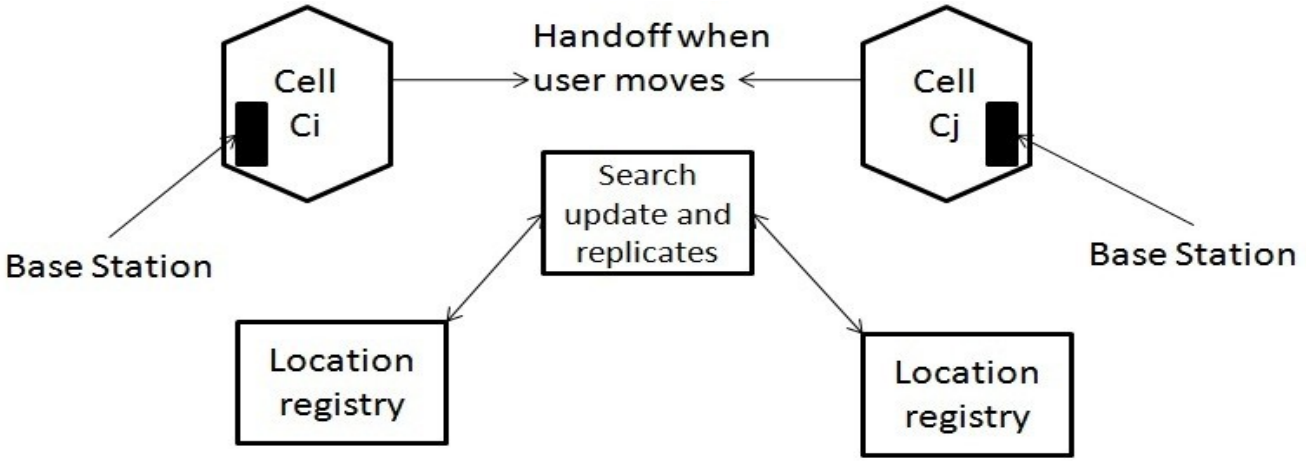

fig. By:
http://rtmnumobile.blogspot.com

Different task of Mobility Management.

1. Location management

Location management enables the networks to track the locations of mobile nodes. Location management has two major sub-tasks: (i) location registration, and (ii) call delivery or paging. In location registration procedure, the mobile node periodically sends specific signals to inform the network of its current location so that the location database is kept updated. The call delivery procedure is invoked after the completion of the location registration. Based on the information that has been registered in the network during the location registration, the call delivery procedure queries the network about the exact location of the mobile device so that a call may be delivered successfully. The design of a location management scheme must address the following issues: (i) minimization of signaling overhead and latency in the service delivery, (ii) meeting the guaranteed quality of service (QoS) of applications, and (iii) in a fully overlapping area where several wireless networks co-exist, an efficient and robust algorithm must be designed so as to select the network through which a mobile device should perform registration, deciding on where and how frequently the location information should be stored, and how to determine the exact location of a mobile device within a specific time frame.

2. Handoff management

Handoff management is the process by which a mobile node keeps its connection active when it moves from one access point to another. There are three stages in a handoff process. First, the initiation of handoff is triggered by either the mobile device, or a network agent, or the changing network conditions. The second stage is for a new connection generation, where the network must find new resources for the handoff connection and perform any additional routing operations. Finally, data-flow control needs to maintain the delivery of the data from the old connection path to the new connection path according to the agreed-upon QoS guarantees. Depending on the movement of the mobile device, it may undergo various types of handoff. In a broad sense,

handoffs may be of two types: (i) intra-system handoff (horizontal handoff) and (ii) inter-system handoff (vertical handoff). Handoffs in homogeneous networks are referred to as intra-system handoffs. This type of handoff occurs when the signal strength of the serving BS goes below a certain threshold value. An inter-system handoff between heterogeneous networks may arise in the following scenarios (i) when a user moves out of the serving network and enters an overlying network, (ii) when a user connected to a network chooses to handoff to an underlying or overlaid network for his/her service requirements, (iii) when the overall load on the network is required to be distributed among different systems.

The design of handoff management techniques in all-IP based next-generation wireless networks must address the following issues: (i) signaling overhead and power requirement for processing handoff messages should be minimized, (ii) QoS guarantees must be made, (iii) network resources should be efficiently used, and (iv) the handoff mechanism should be scalable, reliable and robust.

Handoffs may be classified into two types:

1. Hard Handoff: Characterized by an actual break in the connection while switching from one cell or base station to another. The switch takes place so quickly that it can hardly be noticed by the user. Because only one channel is needed to serve a system designed for hard handoffs, it is the more affordable option. It is also sufficient for services that can allow slight delays, such as mobile broadband Internet.

2. Soft Handoff: Entails two connections to the cell phone from two different base stations. This ensures that no break ensues during the handoff. Naturally, it is more costly than a hard handoff.

Q3.Discuss Mobile Middleware.

Ans:Middleware is software that supports mediation between other software components, fostering interoperability between those components across heterogeneous platforms and varying resource levels

Benefits of mobile middleware:

>Speeds development and deployment cycles

>Reduces risk by offering a field proven solution

>Creates application once and run it over any network or device

>Provide efficient and reliable communications

>Mobile middleware also provides

1.Guaranteed message delivery

2.Push messaging

3.Data security

4.roaming

Three major types of middleware

1.Adaptation

2.Agents

3.Service Discovery

1.Adaptation:

>Adapt behavior and expectations to conserve scare resources

>Adjust quality of service (QoS) – guarantee performance

2.Agents:

Allowing programs to move autonomously about a network in order to access remote resources

3.Service Discovery:

>Dynamically discovering and advertising services

>Extend the client-server paradigm

>Dynamic discovery of services

>Dynamic interaction between clients and services

Q4.Discuss Broadcast Disk Scheduling

1.Pullbased data delivery or on demand data delivery: A client explicitly requests data items from the server.

2.Pushbased data delivery: The server repetitively broadcasts data to a client population without a specific request. Clients monitor the broadcast and retrieve the data items they need as they arrive.

Push vs Pull

1. Push suitable when information is transmitted to a large number of clients with overlapping interests the server saves several messages the server is prevented from being overwhelmed by client requests.

2. Push is scalable: performance does not depend on the number of clients Pull cannot scale beyond the capacity of the server or the network.

3. In push, access is only sequential; Thus, access latency degrades with the volume of data In pull, clients play a more active role.

1 Selective Broadcast

>Broadcast an appropriately selected subset of items and provide the rest on demand, the broadcast is used as an aircache for storing frequently requested data. The broadcast content continuously adjusts to match the hot-spot of the database. The hotspot is calculated by observing broadcast misses indicated by explicit requests for data not on the broadcast.

>The database is partitioned into: a "publication group" that is broadcast and an "on demand" group. The criterion for partitioning is to minimize the backchannel requests while constraining the response time below a predefined upper limit.

2.On Demand Broadcast

>The server chooses the next item to broadcast on every broadcast tick based on the requests for data it has received,Various strategies broadcast the pages in the order they are requested (FCFS), or the page with the maximum number of pending requests.

>A parameterized algorithm for largescale data broadcast based only on the current queue of pending requests .