

A REVIEW ON ANALYSIS OF LOCATION MANAGEMENT IN MOBILE COMPUTING

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ABSTRACT:- Location management consists of change the placement of the user, looking out the placement and acting search updates. Once the host changes location, associate degree update happens. Once the host need to speak with a mobile host whose location is unknown to the requesting host, a groundwork happens. A search-update happens when a flourishing search, once the requesting host updates the placement data similar to the searched mobile host. The goal of an honest location management theme ought to be to supply economical searches and updates. Location management schemes accommodates location updates and placement inquiries. In this, the various location management schemes, numerous search& update methods area unit mentioned. analysis space for Location Management embrace Location Management in Wireless Networks.

Key Word: Location, Location Management, Wireless Network, Mobile Station, MSC, Base Station.

1. INTRODUCTION

Location management is an important area of mobile computing. Location management in mobile network deals with location registration and tracking of mobile terminals. The location registration process is called location update and the searching process is called paging. Managing location information of mobile nodes is an important issue in mobile computing systems. The main task of Location Management is to keep track of a users' location all the time while operating and on the move.



The ability to change locations while connected to the network creates a dynamic environment. This means that data, which is static for stationary computing, becomes dynamic for mobile computing. There are a few questions that must be answered when looking at a LM scheme.

What happens when a mobile user changes location? Who should know about the change? How can you contact a mobile host?

2. Location Management consists mainly of:

2.1 Location Tracking and Updating (Registration): A process in which an end-point initiates a change in the Location Database according to its new location. This procedure allows the main system to keep track of a users' location so that for example an incoming call could be forwarded to the intended mobile user when a call exists or maybe bring a users' profile near to its current location so that it could provide a user with his/her subscribed services.

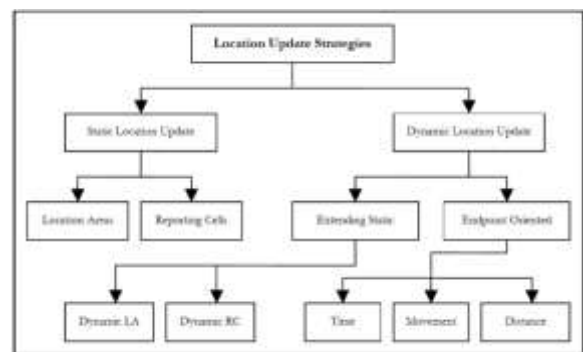


Figure: Classification of Location Strategies

2.1.1 Static Update Strategies: In this approach, there are specific areas in which an update could take place. If a mobile host enters any one of these areas, an update takes place (though there might be instances in which an update does not happen every time).

Two approaches of static updating are as follows:

(A) Location Areas (LAs): Also referred to as Paging Areas or Registration Areas. In this scheme, service areas are created with each area considered a LA. Only when a mobile host moves from one LA to another that an update to its location in the Location Database is taken place.

(B) Reporting Cells: Also referred to as Reporting Centers. In this scheme, updates take place at specific

centers (cells) in the network. Only when a mobile host gets re-located to one of these centers that an update takes place. The main drawback to Static Update Strategies is that they do not accurately account for user mobility and frequency of incoming calls.

2.1.2 Dynamic Update Strategies: In this strategy, a mobile host determines when an update should take place based on its movement, frequency of incoming messages, signal strength and other factors. A natural approach to dynamic strategies is to extend the Static Update Strategies to integrate call and mobility patterns.

Several proposed Dynamic Update Strategies include:

(A) Depending on the incoming call arrival rate and mobility, the size of a mobile host's LA is determined. Analytical results for this approach have shown that this strategy is an improvement over Static Update Strategies when call arrival rates are user-dependent or time-dependent.

(B) An asymmetric distance-based cell boundary system with cell search order optimization that uses a combination of information of the most recent update that took place along with the direction of motion.

(C) Time-based location updates that take place every T seconds.

(D) Movement-based location updates that take place after every M cell crossings.

(E) Distance-based location updates that take place whenever the distance covered exceeds D .

2.2 Location Finding (Paging): The process of which the network initiates a query for an endpoint's location. This process is implemented by the system sending beacons to all cells so that one of the cells could locate the user. This might also result in an update to the location register.

2.2.1 Intersystem Paging: In a multi-tier wireless service area consisting of dissimilar systems, it is desirable for a mobile host to be able to communicate with the various systems and be able to roam between them efficiently and with no problems. Roaming between different systems can be one of two types:

(A) Intrasystem Roaming: Refers to a mobile host that moves between different LAs within the same system.

(B) Intersystem Roaming: Refers to a mobile host that moves between different systems.

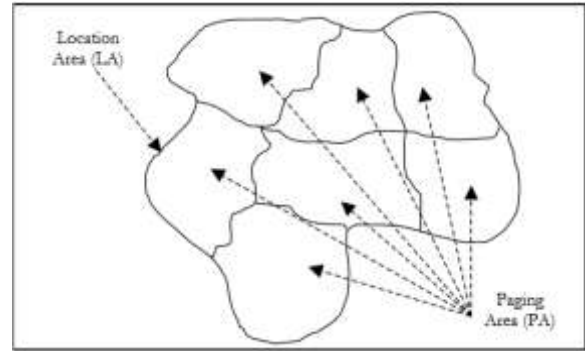


Figure: Location and Paging area

3. Location Management in Wireless Networks:

Most of the initial research on Location Management was based on Wireless Networks in general. Despite the fact that the wireless world has become huge and diverse, there is still a lot of research done in this field.

3.1 Heterogeneous Wireless Networks

In heterogeneous wireless networks, mobile users are able to move from one subsystem to another while maintaining access capability to their subscribed services, which refers to global mobility or global roaming. One of the most challenging problems in global roaming management is LM that consists of keeping track of mobile users who leave their home network and roam into foreign networks that use different protocols. In this context, locating a user requires interoperability between several fixed and mobile subsystems that do not necessarily implement the same technology, which may increase the signaling traffic and decrease the network performance. [Assouma05] proposes a model that improves the efficiency of LM in heterogeneous wireless networks in terms of signaling traffic generated during global roaming. Such a model essentially consists of adding at the boundary location area between two different subsystems a specialized equipment called LR-ING (Location Register and Internetworking Gateway) that is connected to the Home Location Register (HLR) of both subsystems. Numerical results reveal that the proposed scheme enables to reduce the signaling cost generated by the databases by about 45% when compared with other proposed architectures such as the Boundary Location Register (BLR) protocol.

3.2 Replication in Wireless Networks

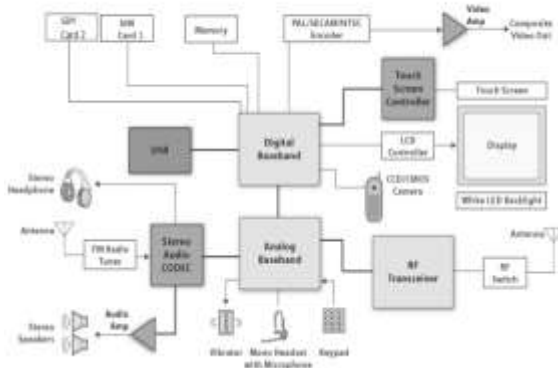
Main focuses on the hierarchical scheme with user profile replication. The two-phase algorithm proposed in previous work, though simple, does not provide insights on whether or why it works well. It also discusses the nature of the replica assignment problem in the context and proposes an optimal solution to it. As the optimal solution takes a

long time to compute, further assumptions are made to simplify the problem and then are solved via dynamic programming. Finally, rather than determining the replica assignment on a per-user basis, [Hwang05] proposes to first cluster mobile users based on their calling and moving patterns and then perform the replica assignment for each group. This will further improve the efficiency of replica assignment, in addition to reducing the storage requirements. A preliminary experimental result shows that the dynamic programming approach returns better replica assignment in most cases. To further reduce the overhead of storage requirements and execution complexity, clustering techniques that group mobile users with similar mobility behavior are incorporated. In this section, the focus was on wireless networks. Heterogeneous wireless networks and replication in wireless networks were discussed.

4. Mobile Station

The Mobile Station refers to the equipment of the user and software needed for the communication with other mobile station of the network.

The Mobile Station consists of the physical equipment, such as the radio transceiver, display and digital signal processors and the SIM card.

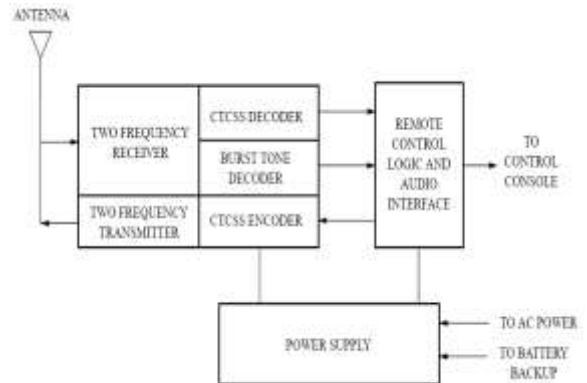


A mobile station communicates with another station, either mobile or land, via a base station. A mobile station cannot communicate with another mobile station directly. To make a call from a mobile station, the mobile station first needs to make a request using a reverse control channel of the current cell. If the request is granted by the MSC, a pair of voice channels will be assigned for the call. To route a call to a mobile station is more complicated.

5. Components in the location management-[5]

5.1 Base Station: A tower or antenna transmittal and receiving radio signals over a cell in an exceedingly wireless network. A network part that interconnects the

mobile station (or Mobile Unit) to the network via the air interface. every cell within the network incorporates a Base station related to it. The first operate of a Base station is to keep up the air interface, or medium, for communication to any mobile unit among its cell.



Base station additionally give another functions like, decision process, signaling, maintenance and medicine.

A Base station could be a transmitter that relays a wireless signal (as from a phone line or net connection) to a smaller hand-held device typically exploitation radio frequencies.

A base station serves every cell. The bottom station is mounted. It's ready to communicate with mobile stations like cellular telephones.

5.2 Base Station Controller (BSC): Associate agent acting functions on behalf of a gaggle of base stations. The BSC handles the allocation of radio channels, controls handovers, performs paging and interfaces with the central network and HLR.

5.3 Cell: A geographical region serviceable by a base station in an exceedingly wireless network, additionally accustomed visit one or additional collocated base stations. Cells are the 'building blocks' of a cellular network, with overlapping cells shaping the coverage space of a selected network. A service coverage space is split into smaller hexangular areas noted as cells.

5.4 Handoff: The method of transferring associate in-progress decision from one cell or base station to a neighboring cell while not interruption.

5.5 Home Location Register (HLR): The central info in an exceedingly cellular network, containing info on all subscribers to a selected carrier. This info additionally contains a record of every user's location, accustomed route calls to the proper cell.

5.6 Location space (LA): A gaggle of neighboring cells combined to make a bigger meta-cell. Devices are liberated

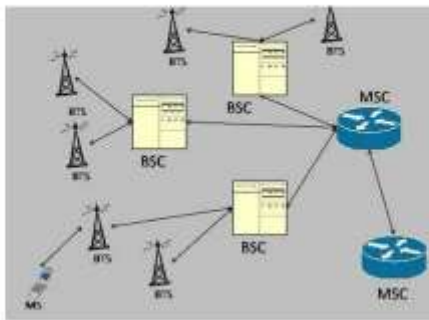
to move among this Location space while not acting a Location Update. Location Areas is also mounted, as in current static schemes, or allotted dynamically on a Location Update.

5.7 Location Management (LM): The upkeep of a record of cell locations for devices in an exceedingly mobile network. The study of Location Management aims to scale back Infobahn price concerned in maintaining this info.

6. Mobile Switching Center

The Mobile switching Centre (MSC) could be a work that produces the association between mobile users among the network, from mobile users to the general public switched phone network and from mobile users to alternative mobile networks.[6]

Mobile Switching Center (MSC)



The MS additionally administers handovers to near base stations, keeps a record of the situation of the mobile subscribers, is liable for subscriber services and request.

7. Issues in Location Management:

Location management has 3 issues: [7]

7.1 Location registration: Once associate MS moves to a replacement MS, messages are changed among the HLR and therefore the new and therefore the previous VLRs. Exchanging messages are for recording and change the new location info of the MS in databases. The method is named location registration.

There are many location registration schemes.

(A) Geography: A user updates the system only if it moves to a replacement RA from associate previous RA.

(B) Timer: The user updates the situation solely sporadically with a timer.

(C) Stimulus: The user performs the situation update only if there's asking.

(D) ON/OFF: A location update happens solely between the time that the MS is hopped-up on and therefore the time that the MS is hopped-up down. During this paper, we are going to emphasize on earth science primarily based location registration, that is employed in most of second generation cellular systems.

7.2 Decision Delivery: The aim is to seek out the referred to as MS (callee) from the business MS (caller) once the decisioner makes a call. Messages are changed among VLRs of the caller and callee and therefore the HLR of the callee. In PCS systems, once the callee is associate MS, the caller should question the callee's HLR via its VLR to understand the VLR location of the callee. Then it queries the VLR of the callee to find out the present location of the callee. The MS of the callee could assign a brief location directory range (TLDN) for the caller and sends the TLDN back to the HLR [8]. The TLDN is forwarded to the MS of the caller. If the situation question is productive, the MS of the caller establishes a association to the MS of the callee.

7.3 Paging: Once associate MS receives a demand associate MS, the MS is aware of whether or not the MS is in its RA. However, it doesn't apprehend that cell the MS is in. The MS can send a paging message to any or all BSs belonged to the MS. If the MS is among the cell of a SB, the SB can send associate acknowledgement back to the MS.

8. CONCLUSIONS

Location Management could be a key issue for wireless mobile networks. While not an honest strategy for Location Management, mobile communication and computing cannot exist. Many static location management methods for identification of user, update the user location in location server supported a hierarchic tree structure info are mentioned. Static location management uses one combination of search, update and search-update methods throughout the execution. It absolutely was noticed that acting search-updates considerably reduced mixture prices.

Dynamic location management and pursuit theme are mentioned. Location management regarding mobile host is replicated, so, not all MSSs ought to store the situation of each mobile host.

The location management theme imposes low computation, communication and storage overheads. Moreover, mobile hosts and therefore the wireless links don't incur any of those overheads, that could be a fascinating feature as they're typically resource poor. The overheads are visible to the MSSs and therefore the

mounted wire line network, that are relatively resource made.

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