lec 8   Location Mangment   / /

Network track active user's Current Call

- (1) location updates (MS send location to BS)
- (2) Paging (cellular network send location request to BS)

Routing for Best route from Sender to Reciever

Location update

Static → Predetermined set of cells which location update must be Performed

Dynamic → location update is generated by MS based on mobility

[2] Global → all subscribers update their location

local → Subscriber choose when to update locti
where

③ Mobility Model

models for movment of mobile user and how their location , velocity , acceleration change over time

① Random walk ② Random waypoint ③ city section
④ Cell residence time Based ⑤ Markov walk ⑥ Activity Based

① Random walk → time slot

subscriber decide to stay or move

using random direction , speed travel , from predefined ranges [Speed min , Speed max]

and [0 : 2π]

Movment is Const time ───→ (t)

Const dist ───→ (d)

3 - 9 Cells

Cellular Network

② Random waypoint → node start random destination
and random speed
node moves to destenation and pauses for a
fixed period before another random
location, speed are chooses

③ City section → nodes are located in intersections
Based on speed, Block length, time
MS choose destintion intersection,
path with least travel time
↳ node moves along it

④ Gauss Markov model → Fixed time interval
movment is updated by Current speed, direction of
MS
Values of speed, direction at movment (n) are Calculated
on value, speed, direction at $(n-1)$ movment

⑤ Cell Residence Based
Random or Gamma distribution to determine
Cell residence time

⑥ Activity Based
determine route Based on next
activity to Perform by user

Imp

how does <u>Network</u> track user's Current <u>Cell</u> ?
/ /

Static	Dynamic
Never update	Time Based
Always update	Movment Based
Location Area	
Reporting Cell	

[1] Never update scheme
- MS ——→ X tell MSC where it is
- when network need to forward new Call, it (Pages) all service
- Very expensive (band width)

[2] Always update
MS detect new Cell ——→ Send location update to MSC
Network knew where (MS) is
expensive to Ms

[3] location Area
track off between (network Paging) , (MS updates)
Divide Service area Into (location Area) (LAS)
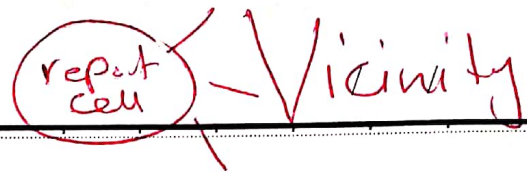each (la) → Contain number of adjacent Cells
└→ has unique Id
each (BS) broadCast (ID) of (LA) which it belongs
when (MS) enter new (LA) it updates location with (MSC)

when network need to find (MS) it Page (LA)

[4] Reporting Cell

- Select Subset of Cells as reporting cells
- Cell broadcast signal to indicate if it is reporting or not

- Reporting Cell (i) (Vicinity) is all non reporting cells reachable from Cell (i) without crossing another reporting cell

- (MS) updates location when move to repot Cell
- (Cellular network) (Pages) (MS) in reporting cell, Vicinity
- Cost of Cell increase by the size of viciting

Dynamic

① Time Based

Given time threshold (T), MS updates location every (T)

when Cellular Syst. has incoming Call for Ms

it pages Cell (i) where last update made

i → not found
Cell i+j, i-j
j start with (1)

② Movement Based

(MS) keeps Counter that inc by (i) when (MS) cross boundry to new (Cell)

Boundry Crossing can be detected by Comparing (BS) ID

when Counter reaches a predetermined threshold (M), MS update its location, Counter = 0

MS is guaranteed to be within distance (M) from its last

T → Per user basis

reported Cell (residing area) منو الكهاراة