

**BLG 632E**

**NEXT GENERATION**

**WIRELESS NETWORKS**

CRN: 23552

INSTRUCTOR: IRFAN ALI

**ASSIGNMENT #4**

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1.

1.1.

Tracking area updates has a control communication overhead on the network. Cell ping-pong effect is the major weakness of location area schemes. If a user moves repeatedly between the boundaries of two or more location areas, inducing a high location update rate with comparatively low physical mobility.

1.2.

With tracking area non-overlapping scheme, every time when UE moves between tracking area boundaries, a tracking area update is needed. So comparatively low physical mobility leads to a tracking area update.

With tracking area overlap scheme, when UE enters another tracking area boundary, it is still connected to its original tracking area. Tracking area update is only needed when UE moves beyond its original tracking area boundary. So comparatively high physical mobility is needed to a tracking area update. This leads to reduction on cell ping-pong effect.

2.

Variables:

Tue = 128 frames

Tc = 128 frames

Ns = 0.25 (1/4), i.e every 4th radio frame contains 1 paging subframe

IMSI = 286 01 0123456789

Answer:

*T = min (Tc, Tue)*

T = min (128, 128)

**T = 128**

*Ns = max (1, number of paging subframes per frame(Nf) )*

4 = max(1, Nf)

**Nf = 4**

*N = min (T, number of paging subframes per frame X T)*

N = min (128, 4 X 128)

**N = 128**

*UE\_ID = IMSI mod 1000*

UE\_ID = 286 01 0123456789 mod 1000

**UE\_ID = 789**

*i\_s = floor(UE\_ID/N) mod Ns*

i\_s = floor(789/128) mod 4

i\_s = 6 mod 4

**i\_s = 2**

*SFN mod T = (T/N) X (UE\_ID mod N)*

SFN mod 128 = (128/128) X (789 mod 128)

SFN mod 128 = 1 X 21

**SFN = 21**

3.a. From CN -> HA

|  |  |
| --- | --- |
| src=IP\_CN  dst=IP\_HoA | IP Payload |

3.b. From HA -> MN

|  |  |  |  |
| --- | --- | --- | --- |
| src=IP\_NA  dst=IP\_CoA | |  |  | | --- | --- | | src=IP\_CN  dst=IP\_HoA | IP Payload | |

3.c. From MN -> HA

|  |  |  |  |
| --- | --- | --- | --- |
| src=IP\_CoA  dst=IP\_NA | |  |  | | --- | --- | | src=IP\_HoA  dst=IP\_CN | IP Payload | |

3.d. From HA -> CN

|  |  |
| --- | --- |
| src=IP\_HoA  dst=IP\_CN | IP Payload |