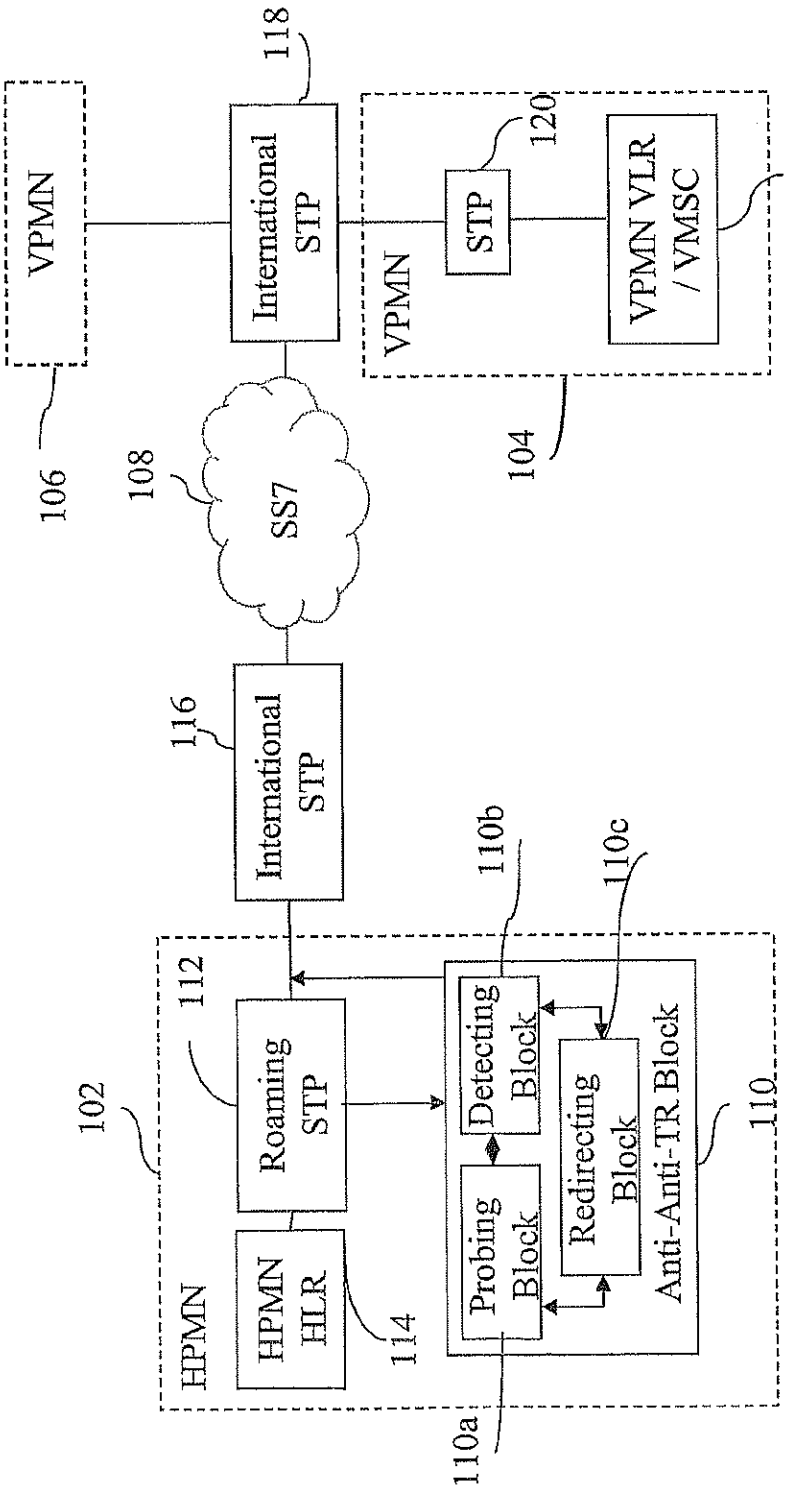

VPMN
106
108
SS7
118
International STP
116
International STP
104
VPMN
120
STP
VPMN VLR / VMSC
122
102
HPMN
112
Roaming STP
HPMN HLR
114
110
Anti-Anti-TR Block
Detecting Block
Redirecting Block
Probing Block
110a
110b
110c

FIGURE 1

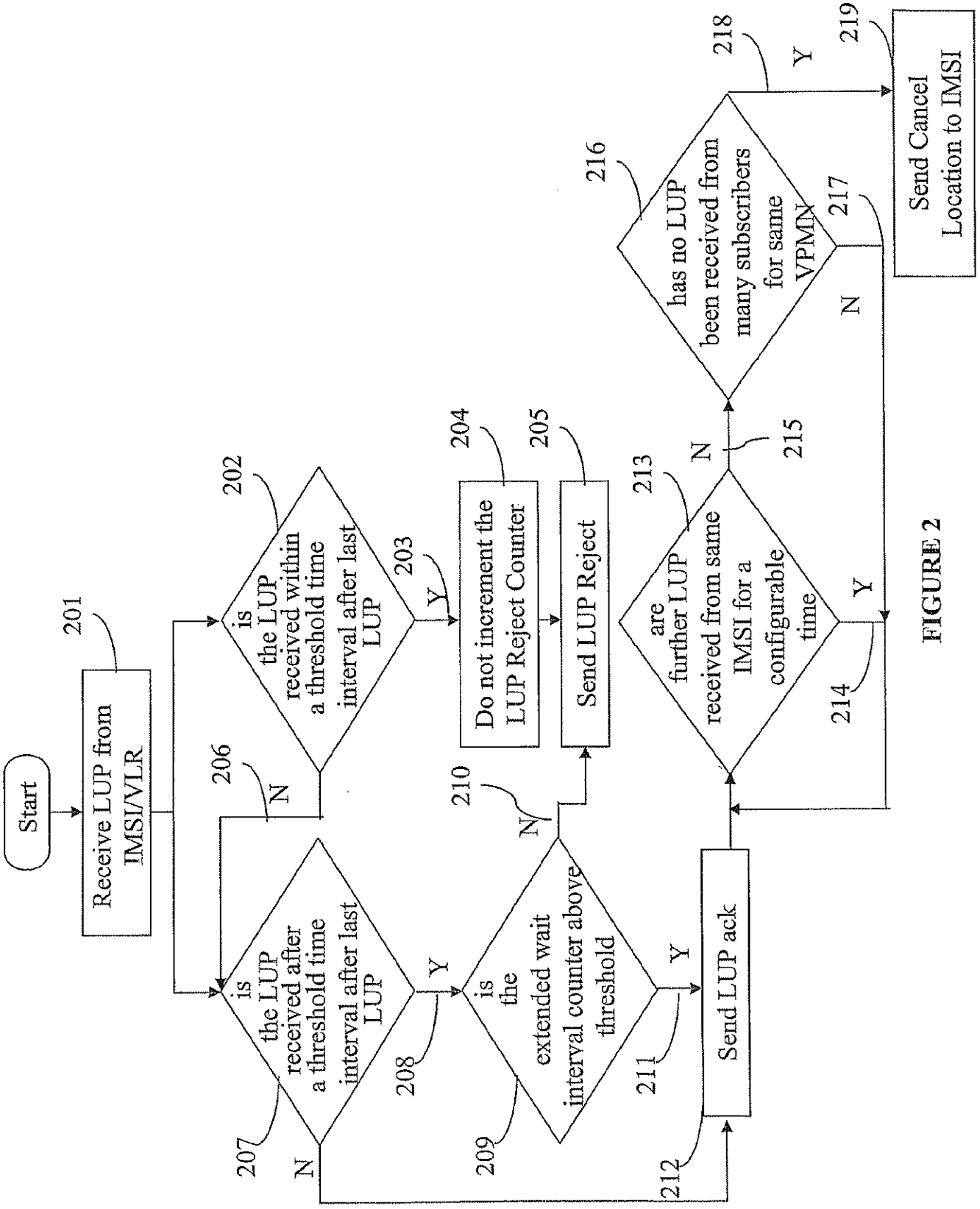

Start
Receive LUP from IMSI/VLR
201
is the LUP received within a threshold time interval after last LUP
202
Y
203
Do not increment the LUP Reject Counter
204
Send LUP Reject
205
N
206
is the LUP received after a threshold time interval after last LUP
207
Y
208
is the extended wait interval counter above threshold
209
N
210
Y
211
Send LUP ack
212
are further LUP received from same IMSI for a configurable time
213
Y
214
N
215
has no LUP been received from many subscribers for same VPMN
216
Y
217
N
218
Send Cancel Location to IMSI
219

FIGURE 2

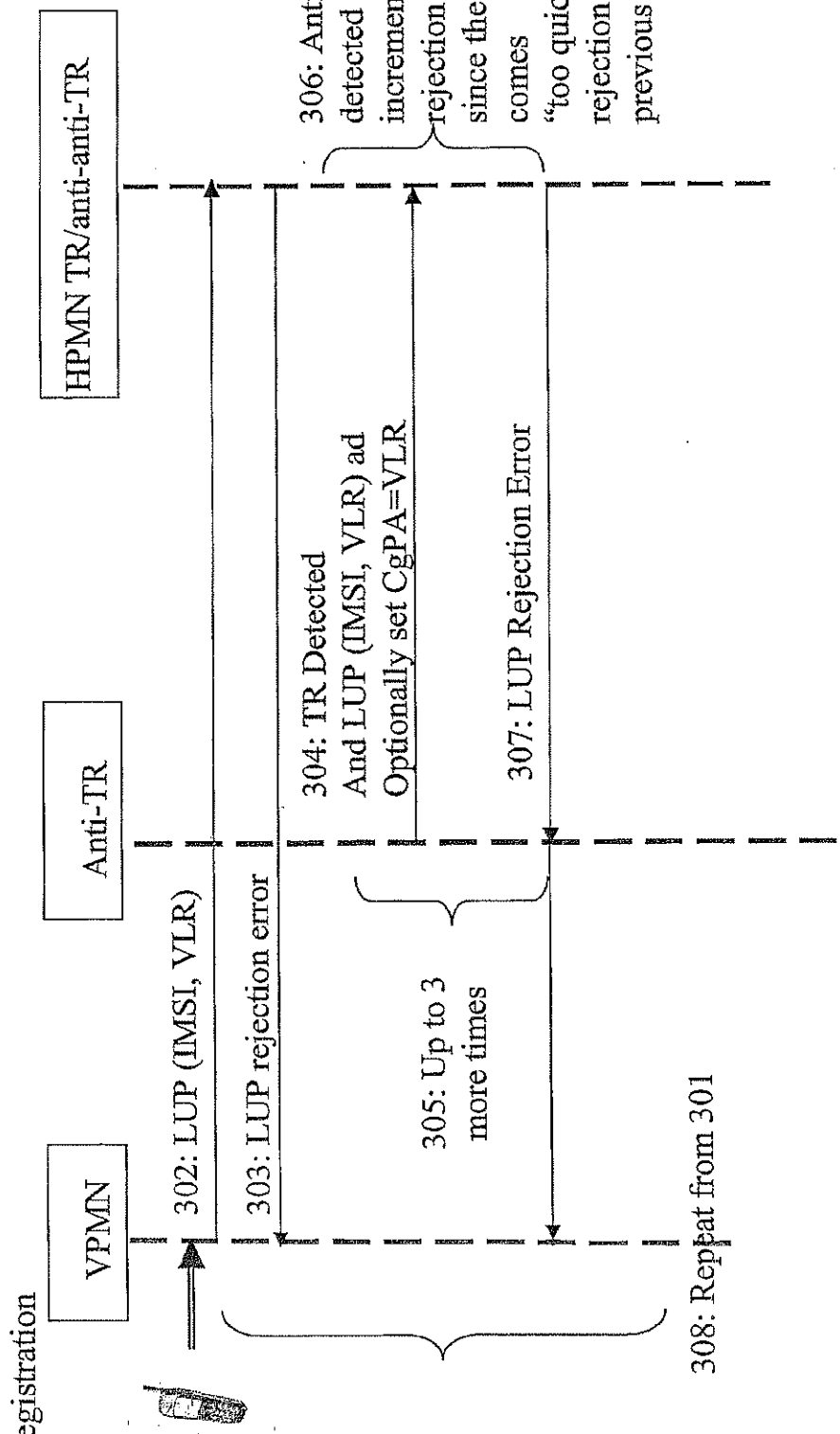

301: registration
VPMN
Anti-TR
HPMN TR/anti-anti-TR
302: LUP (IMSI, VLR)
303: LUP rejection error
304: TR Detected
And LUP (IMSI, VLR) ad
Optionally set CgPA=VLR
305: Up to 3
more times
307: LUP Rejection Error
306: Anti-TR
detected and don't
increment TR
rejection counter
since the LUP
comes
"too quick" after
rejection to a
previous LUP.
308: Repeat from 301

FIGURE 3

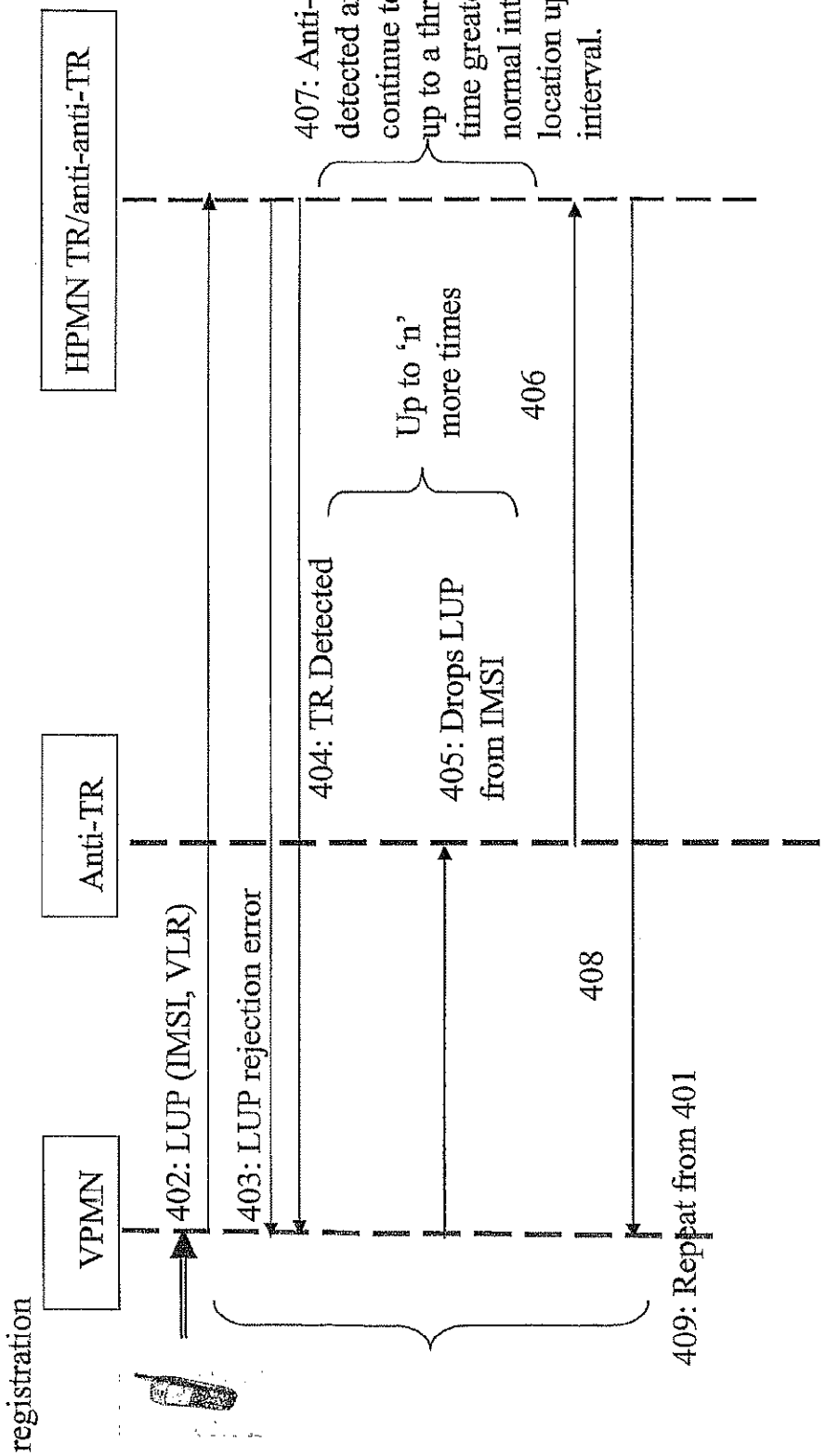

401: registration
VPMN
Anti-TR
HPMN TR/anti-anti-TR
402: LUP (IMSI, VLR)
403: LUP rejection error
404: TR Detected
405: Drops LUP from IMSI
Up to 'n' more times
406
407: Anti-TR detected and continue to wait up to a threshold time greater than normal inter location update interval.
408
409: Repeat from 401

FIGURE 4

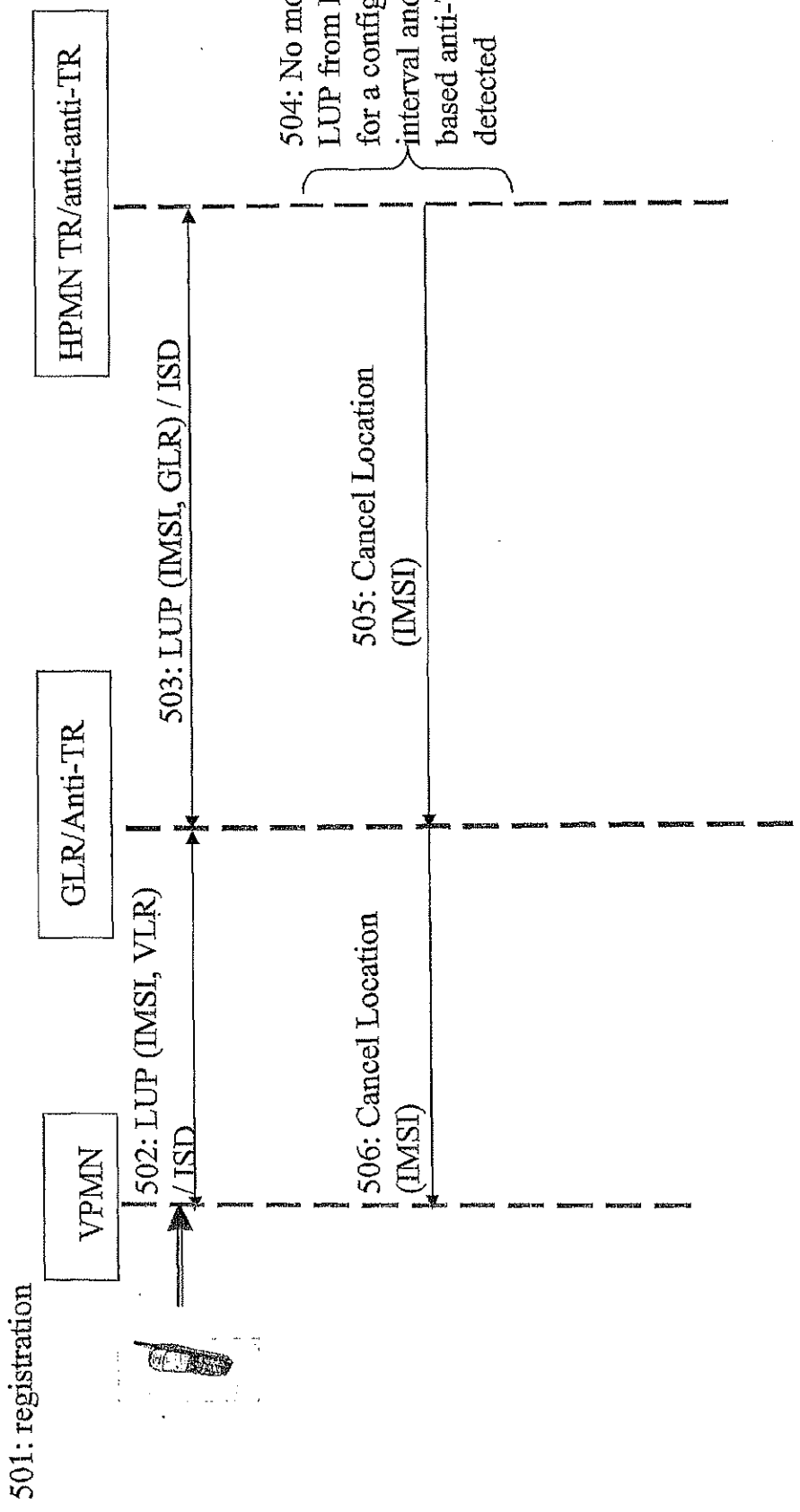

501: registration
VPMN
GLR/Anti-TR
HPMN TR/anti-anti-TR
502: LUP (IMSI, VLR) / ISD
503: LUP (IMSI, GLR) / ISD
504: No more LUP from IMSI for a configurable interval and GLR-based anti-TR detected
505: Cancel Location (IMSI)
506: Cancel Location (IMSI)

FIGURE 5