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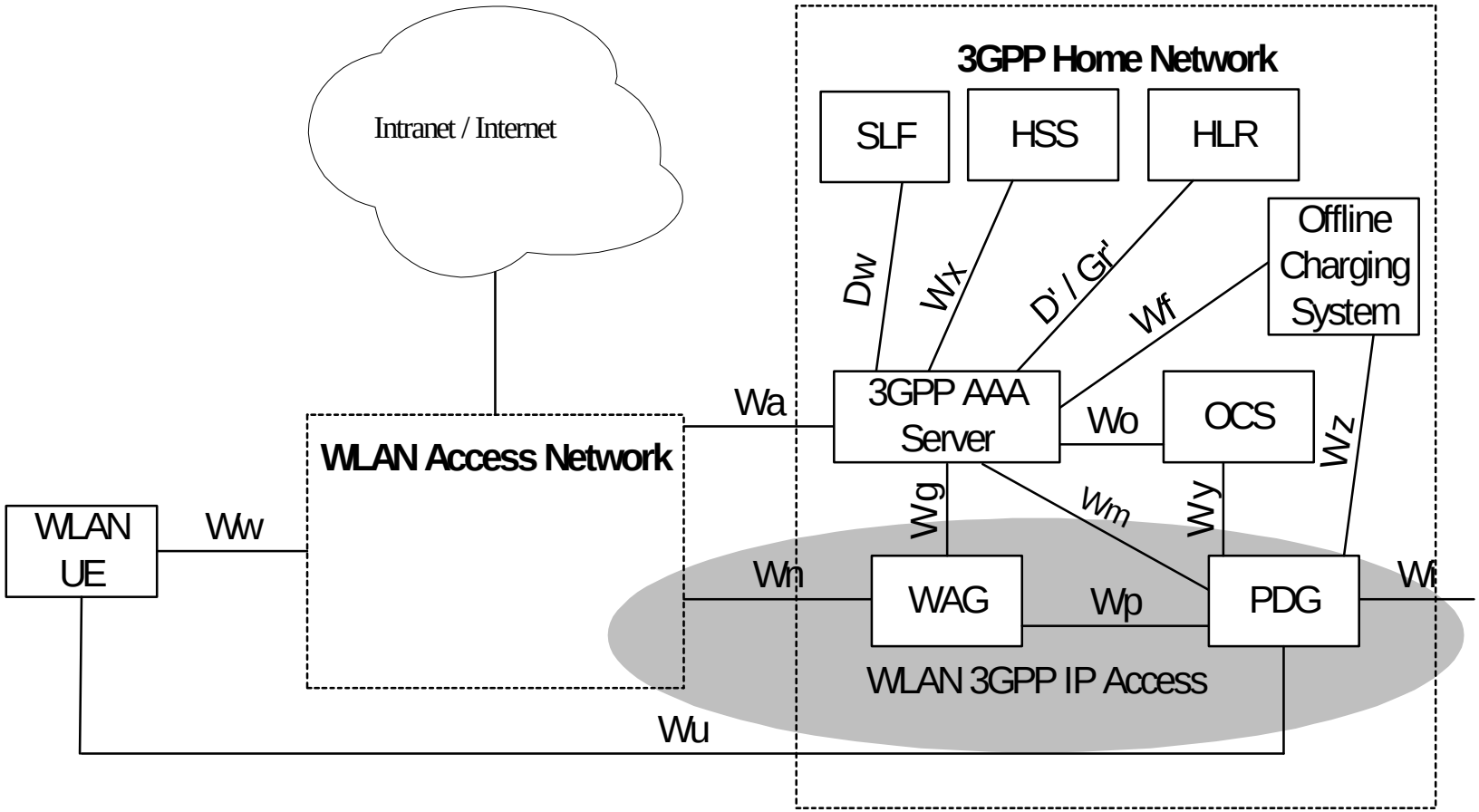
Feasibility Study of Mobility between 3GPP-WLAN Interworking and 3GPP System (Release 8)

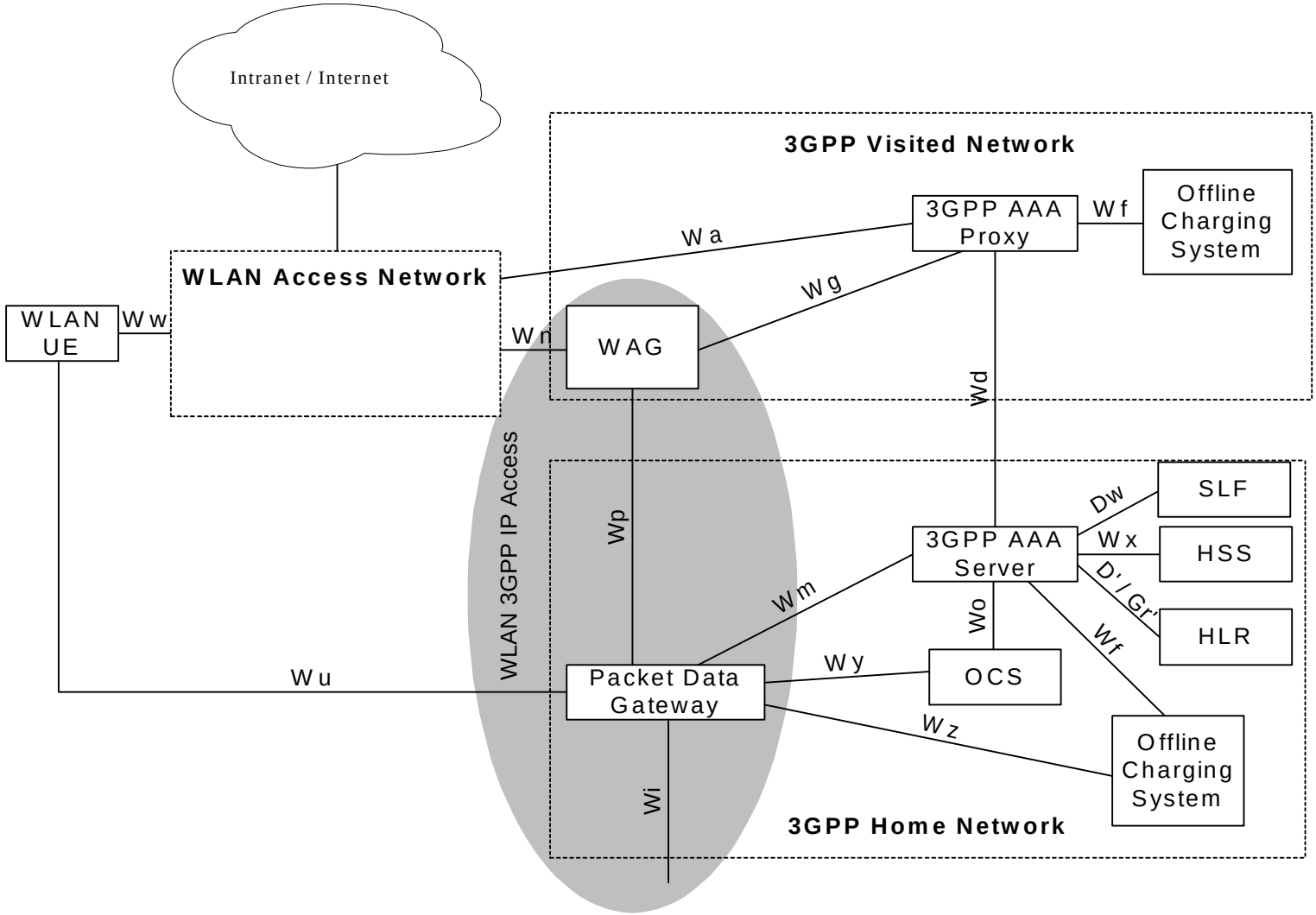
Report：易衛漢

2008/11/18

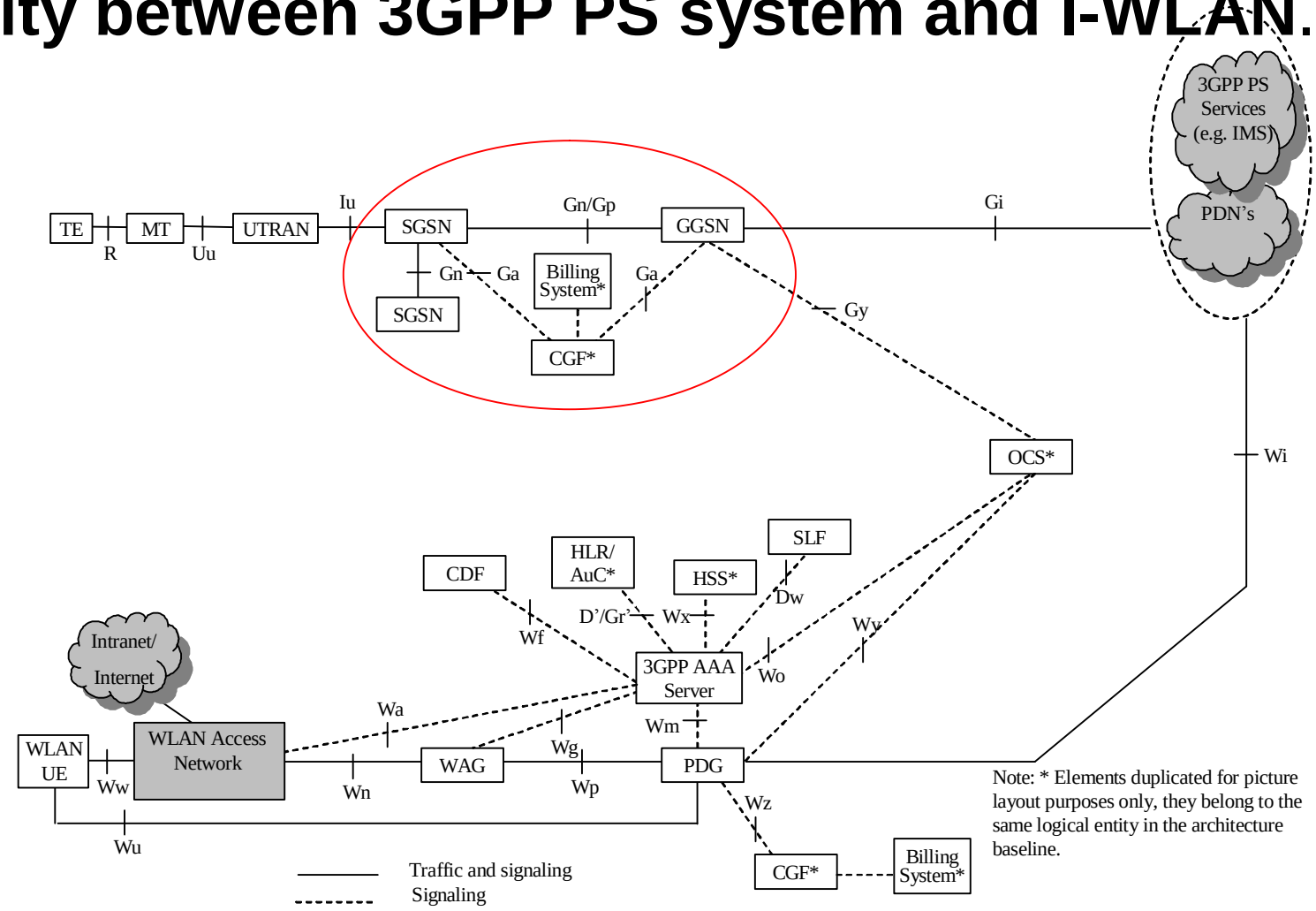
Non Roaming WLAN Inter-working Reference Model



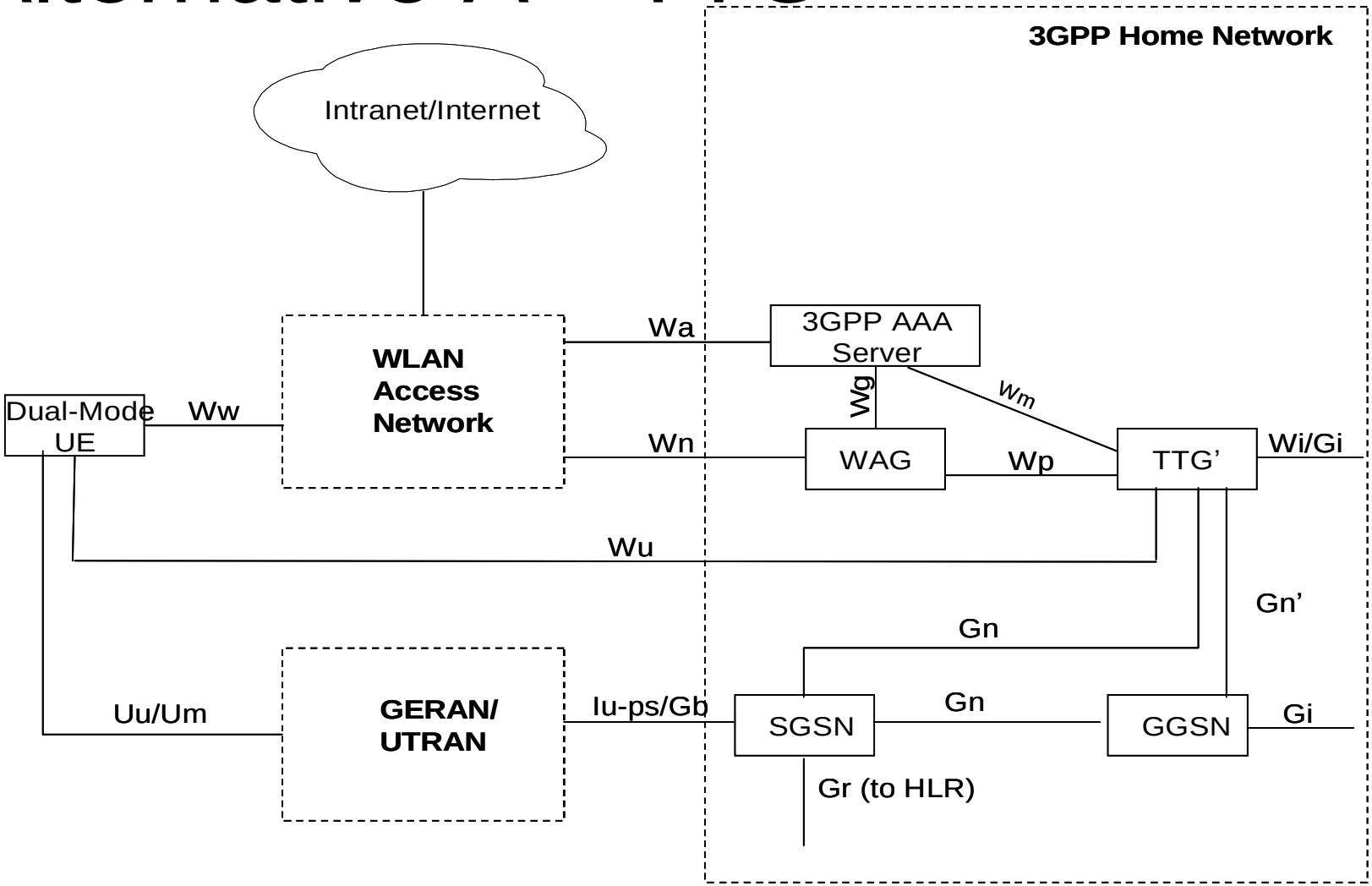
Roaming WLAN Inter-working Reference Model

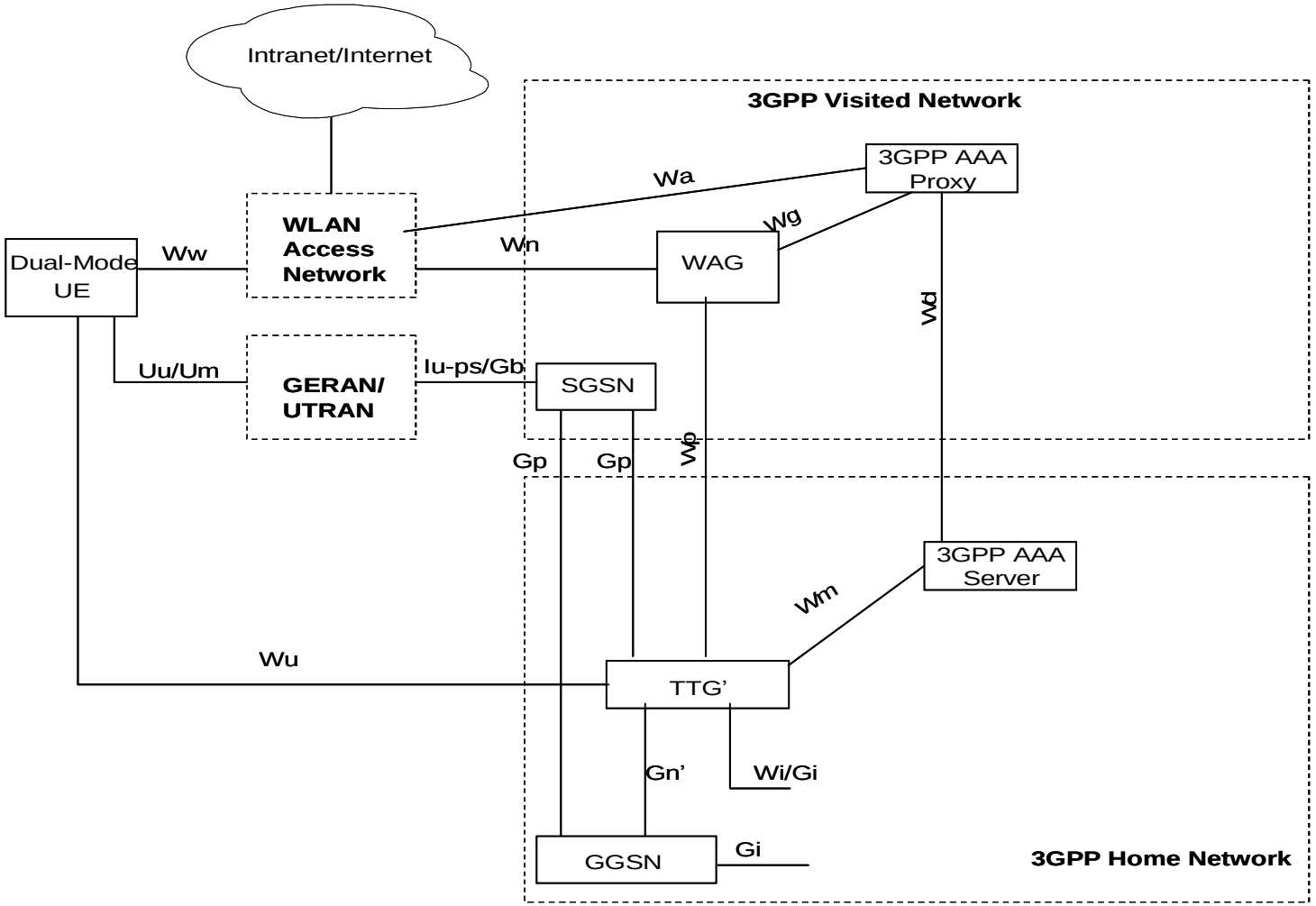


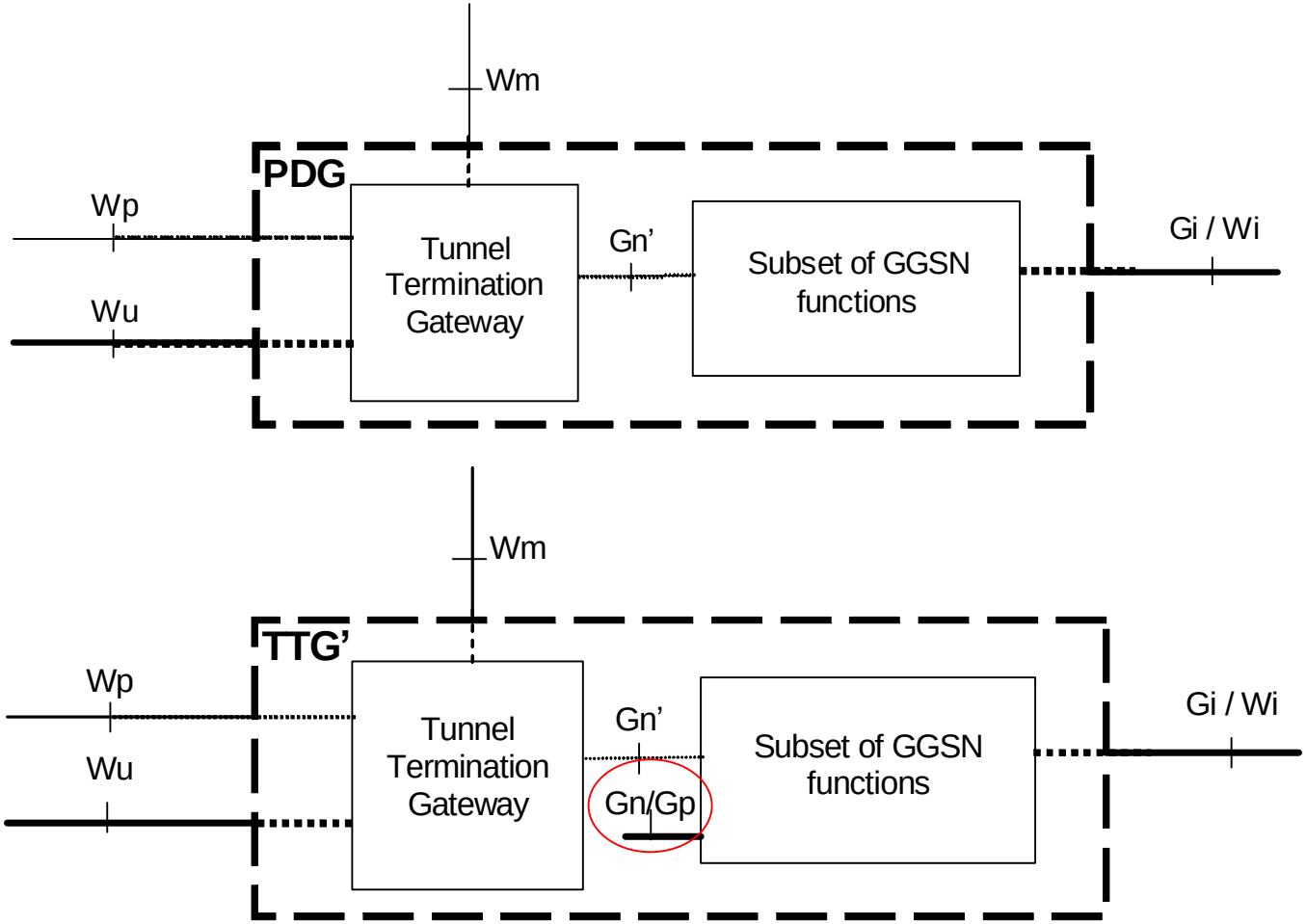
The baseline non-roaming architecture for defining mobility between 3GPP PS system and I-WLAN.



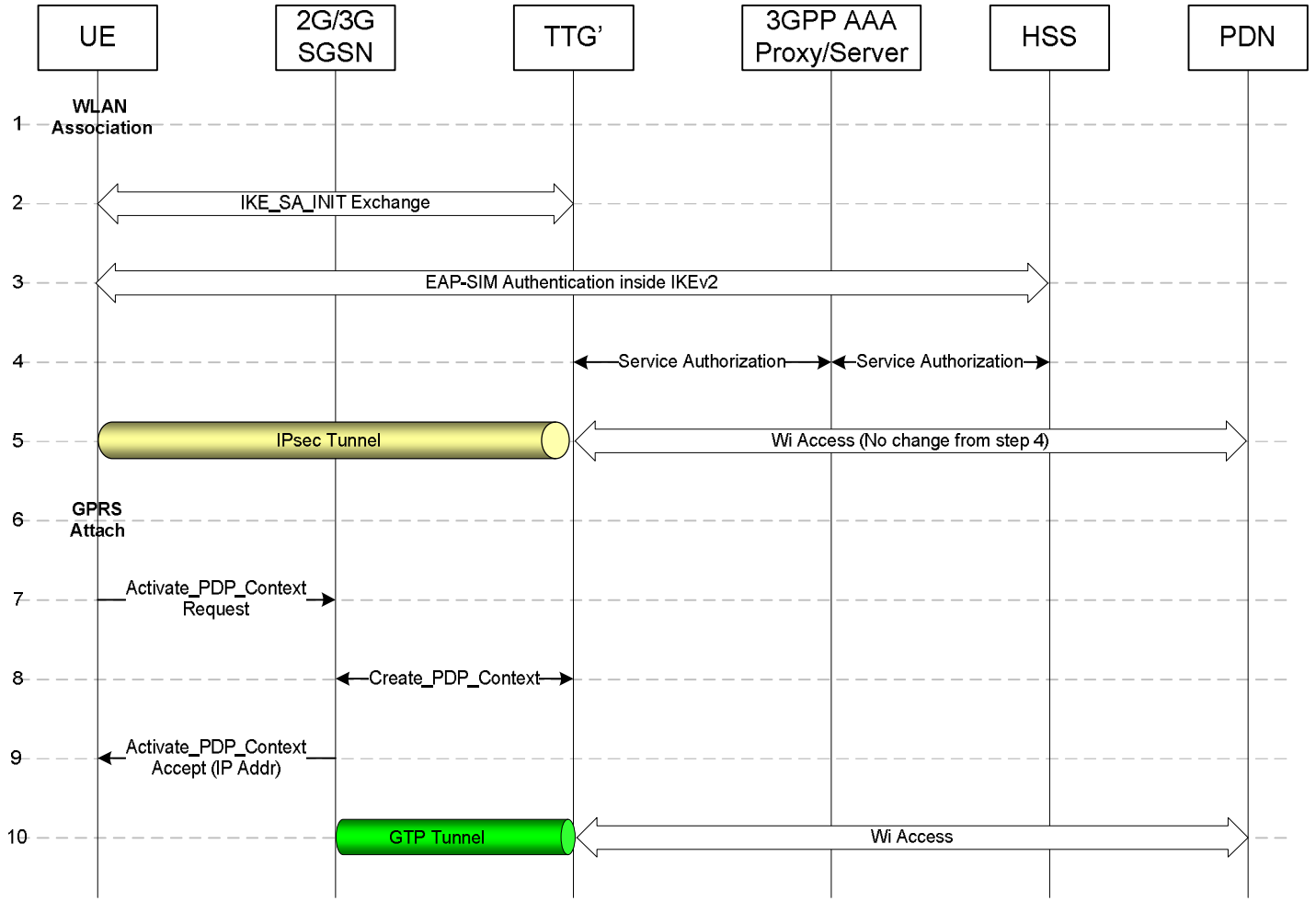
Alternative A : TTG’



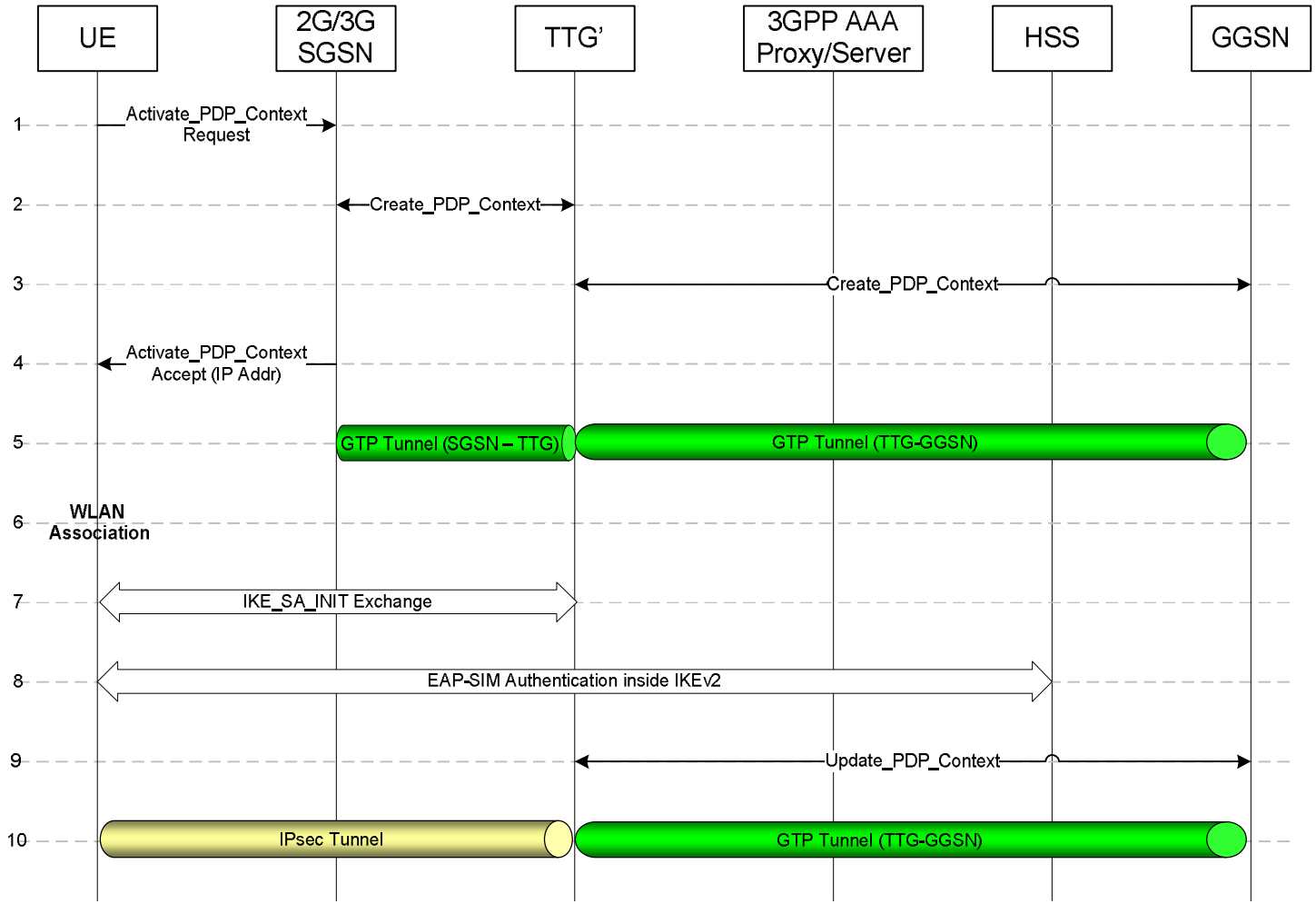

Intranet/Internet
3GPP Visited Network
3GPP AAA Proxy
Wa
Wg
Wd
Wn
WLAN Access Network
Dual-Mode UE
Ww
WAG
Uu/Um
GERAN/ UTRAN
Iu-ps/Gb
SGSN
Gp
Gp
Wp
3GPP AAA Server
Wm
Wu
TTG'
Gn'
Wi/Gi
GGSN
Gi
3GPP Home Network


Wm
PDG
Wp
Wu
Tunnel Termination Gateway
Gn'
Subset of GGSN functions
Gi / Wi
Wm
TTG'
Wp
Wu
Tunnel Termination Gateway
Gn'
Gn/Gp
Subset of GGSN functions
Gi / Wi

I-WLAN to 3G Access System handover (Wi Services)

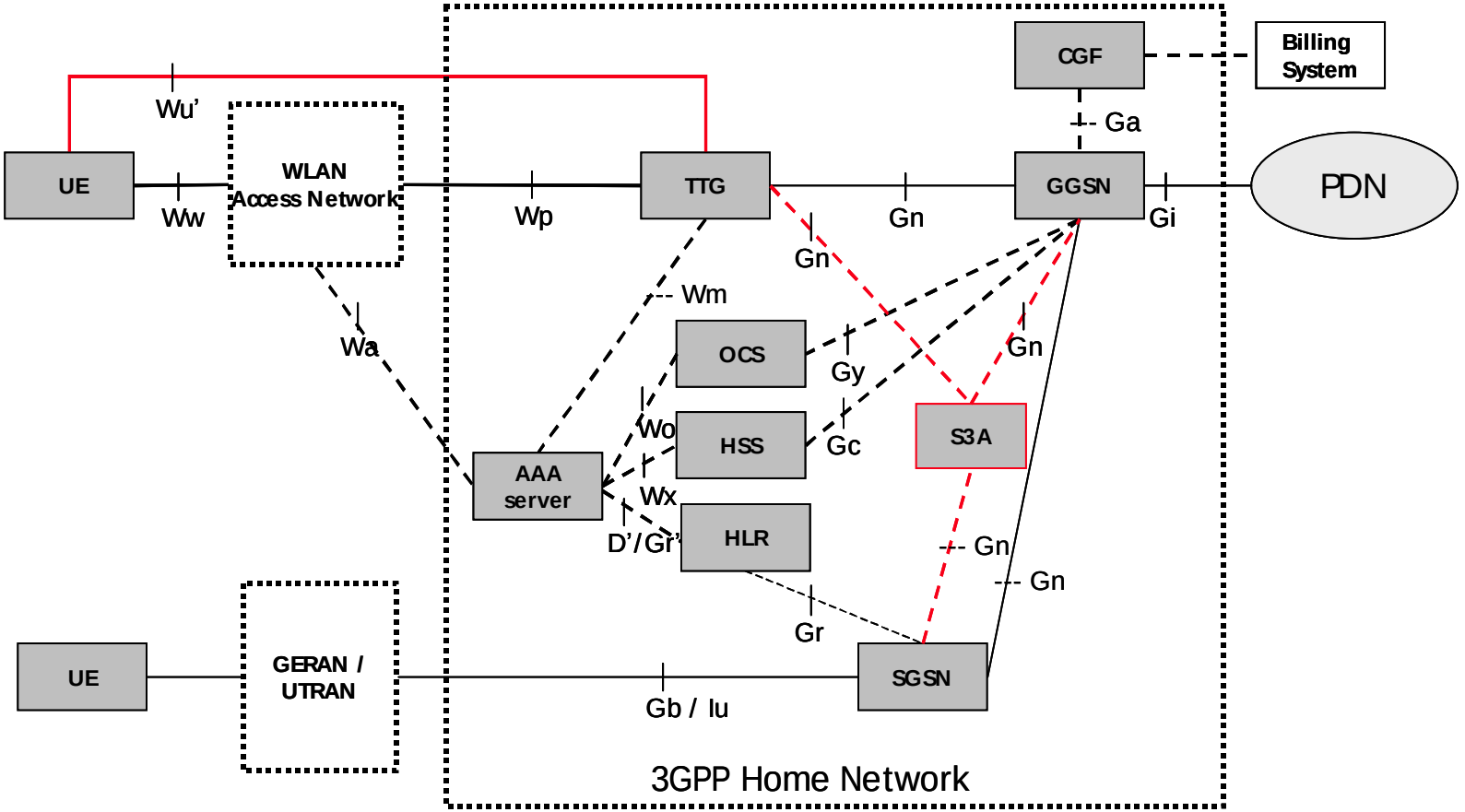


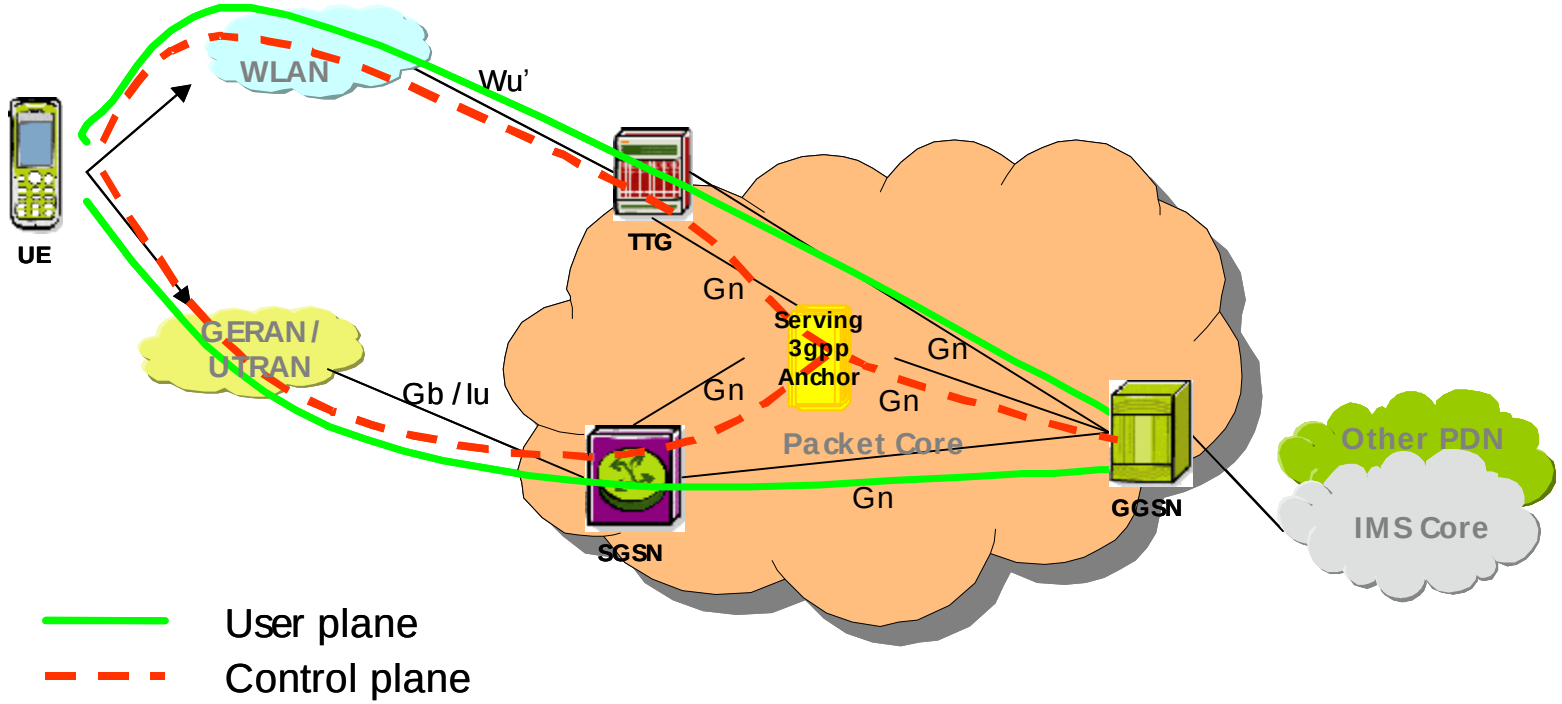
3GPP Access System to I-WLAN handover (Gi Services)



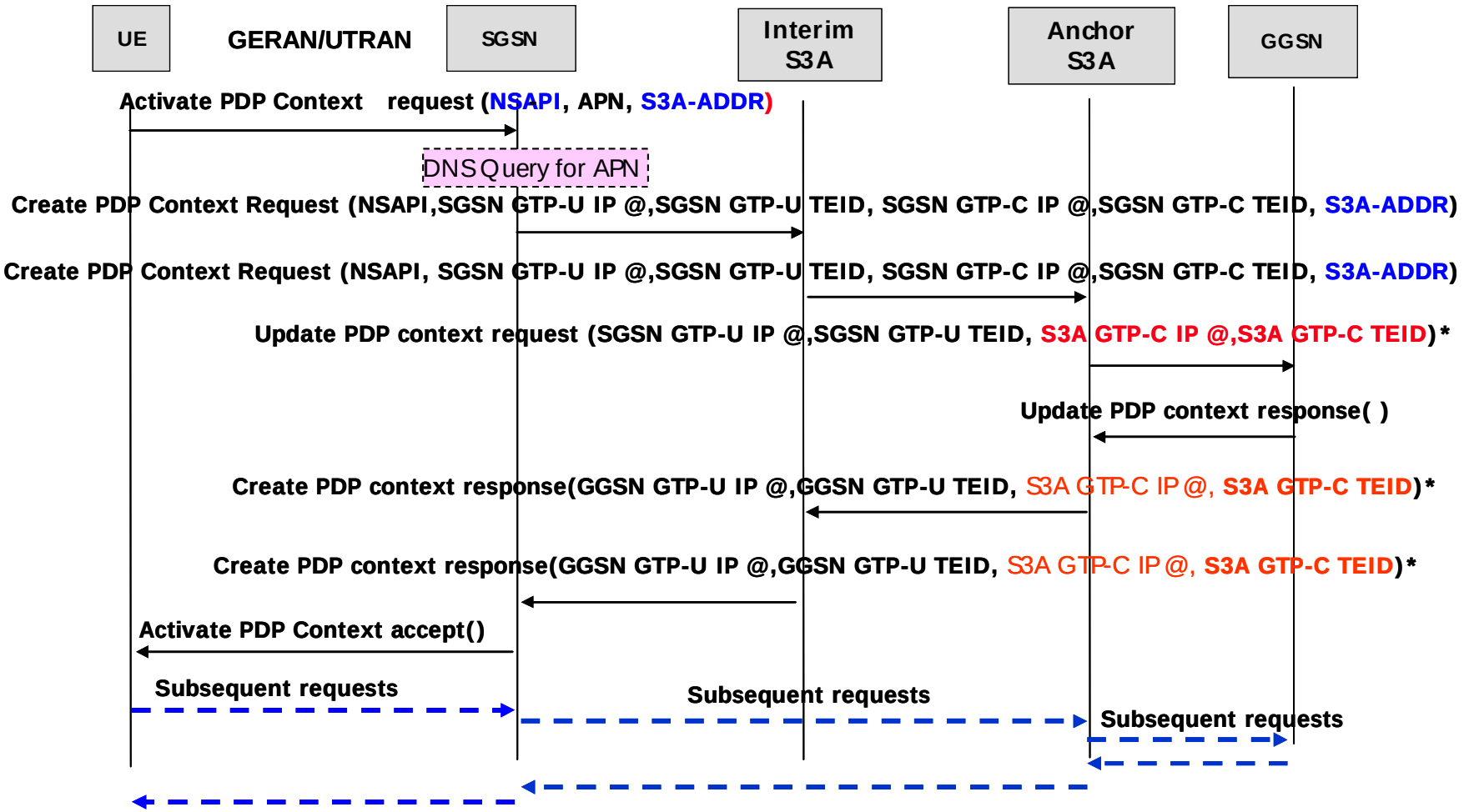
Alternative B：
Single Tunnel Serving-3gpp-Anchor solutions

Architecture reference model of I-WLAN Mobility solution for a split PDG.

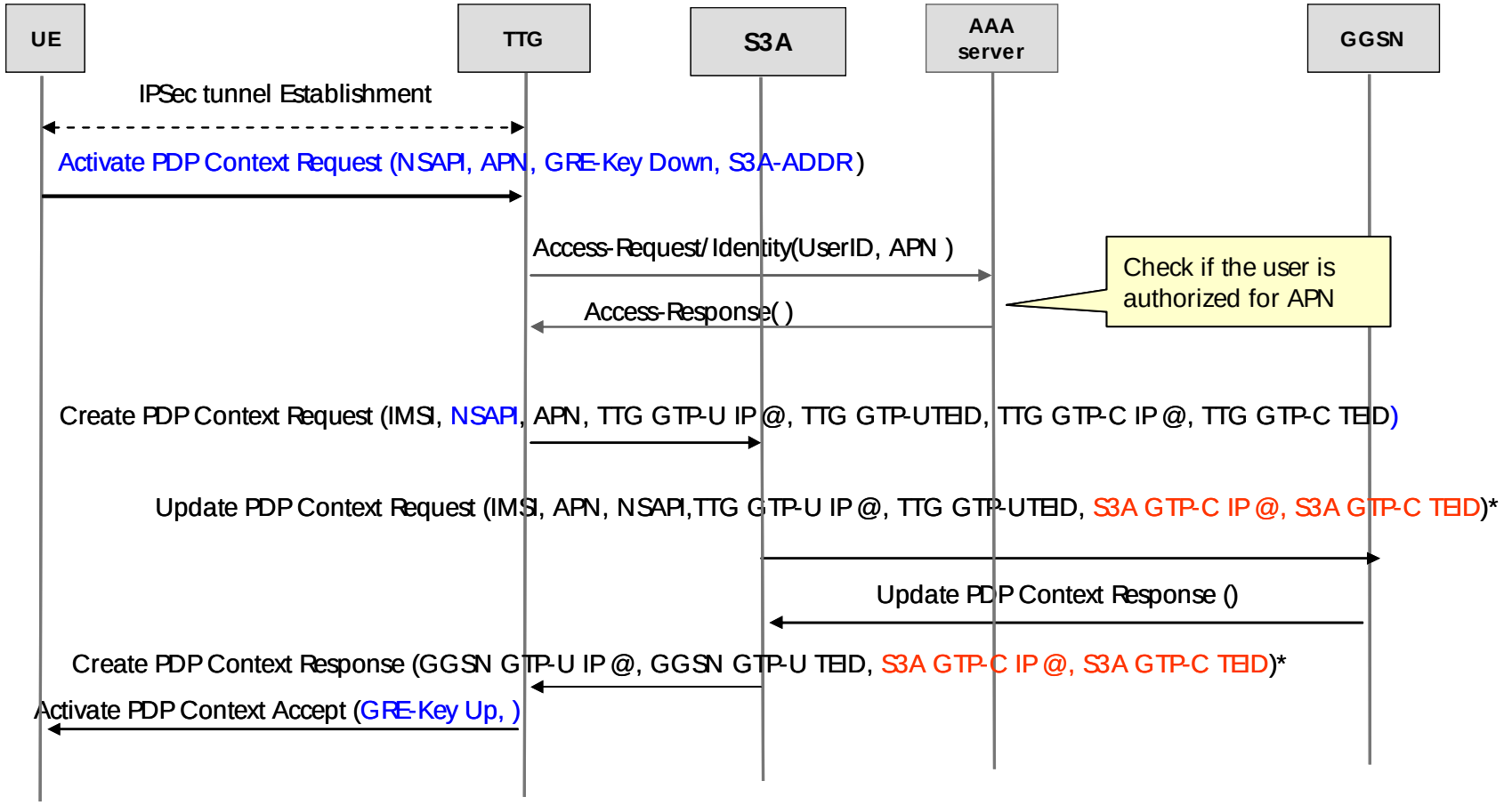



WLAN
Wu'
UE
TTG
Gn
Serving
3gpp
Anchor
GERAN /
UTRAN
Gb / Iu
Gn
Gn
Gn
Packet Core
Gn
GGSN
Other PDN
IMS Core
SGSN
User plane
Control plane

Handover from WLAN to GERAN/UTRAN

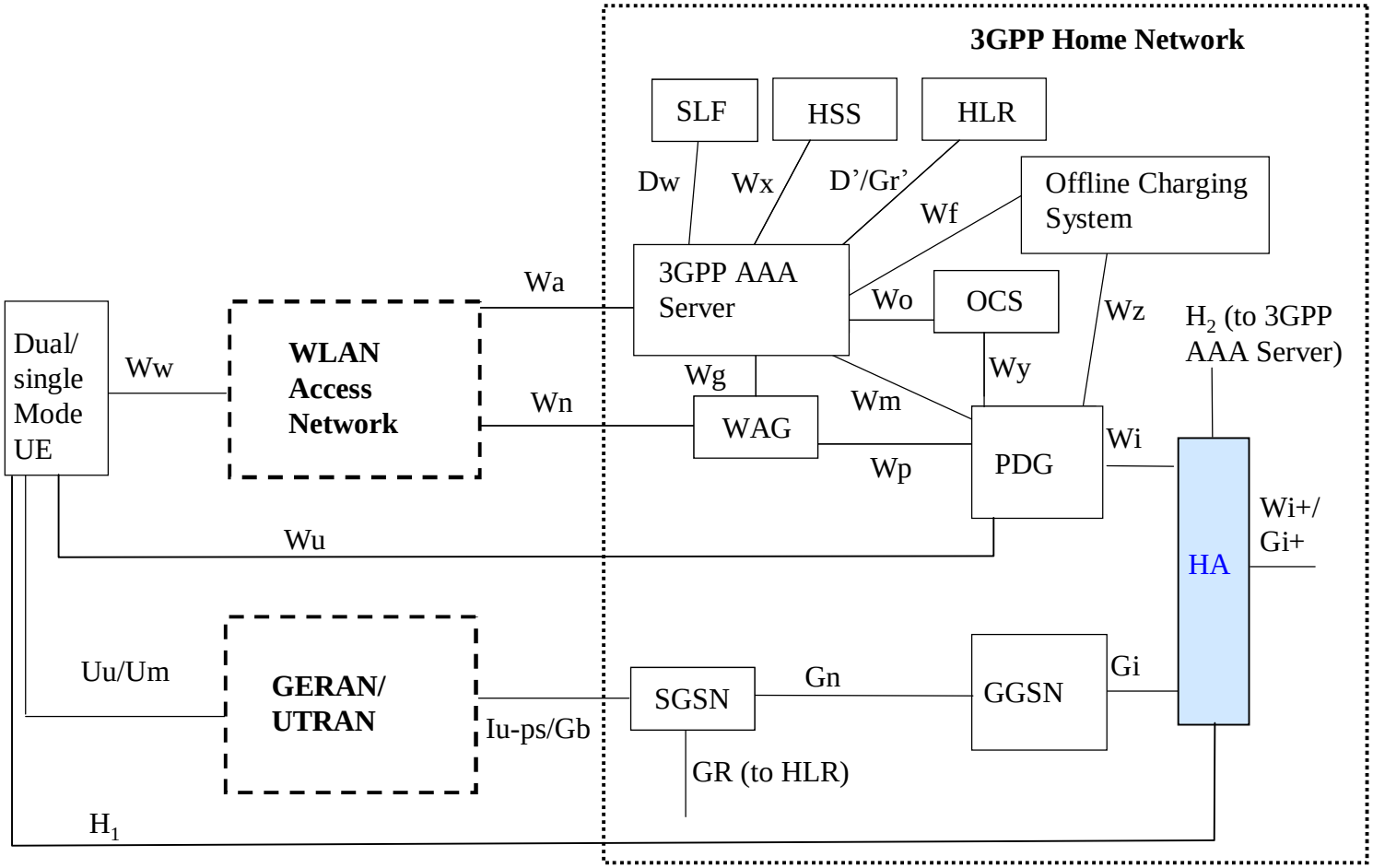


Handover from GERAN/UTRAN to WLAN

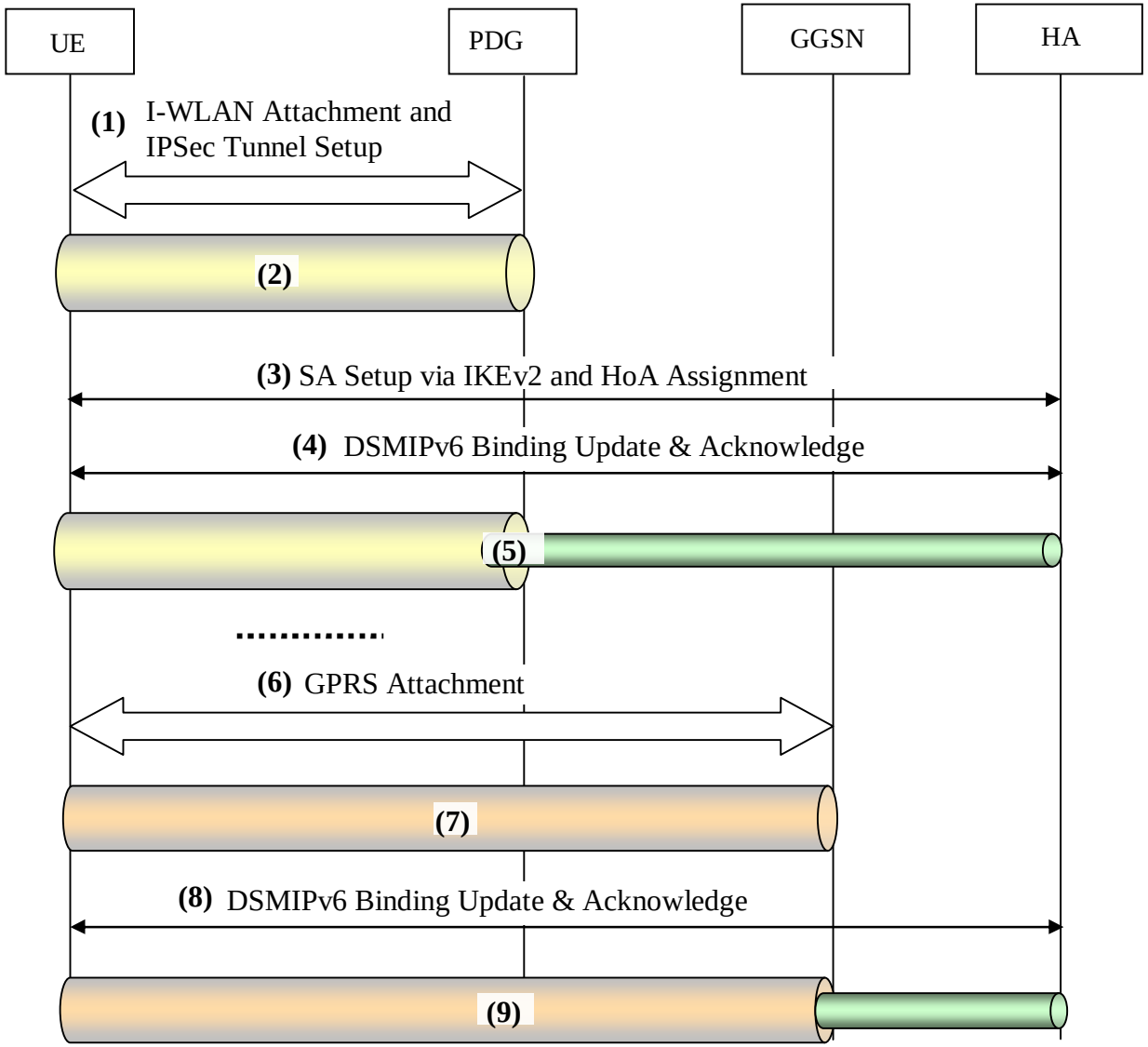


*Depending on operator's configuration with regards to the user plane path rules, the user plane may go through the S3A . In this case, the S3A sends an Update PDP context request / Create PDP context response with its own TEID and IP addresses for control and user planes.

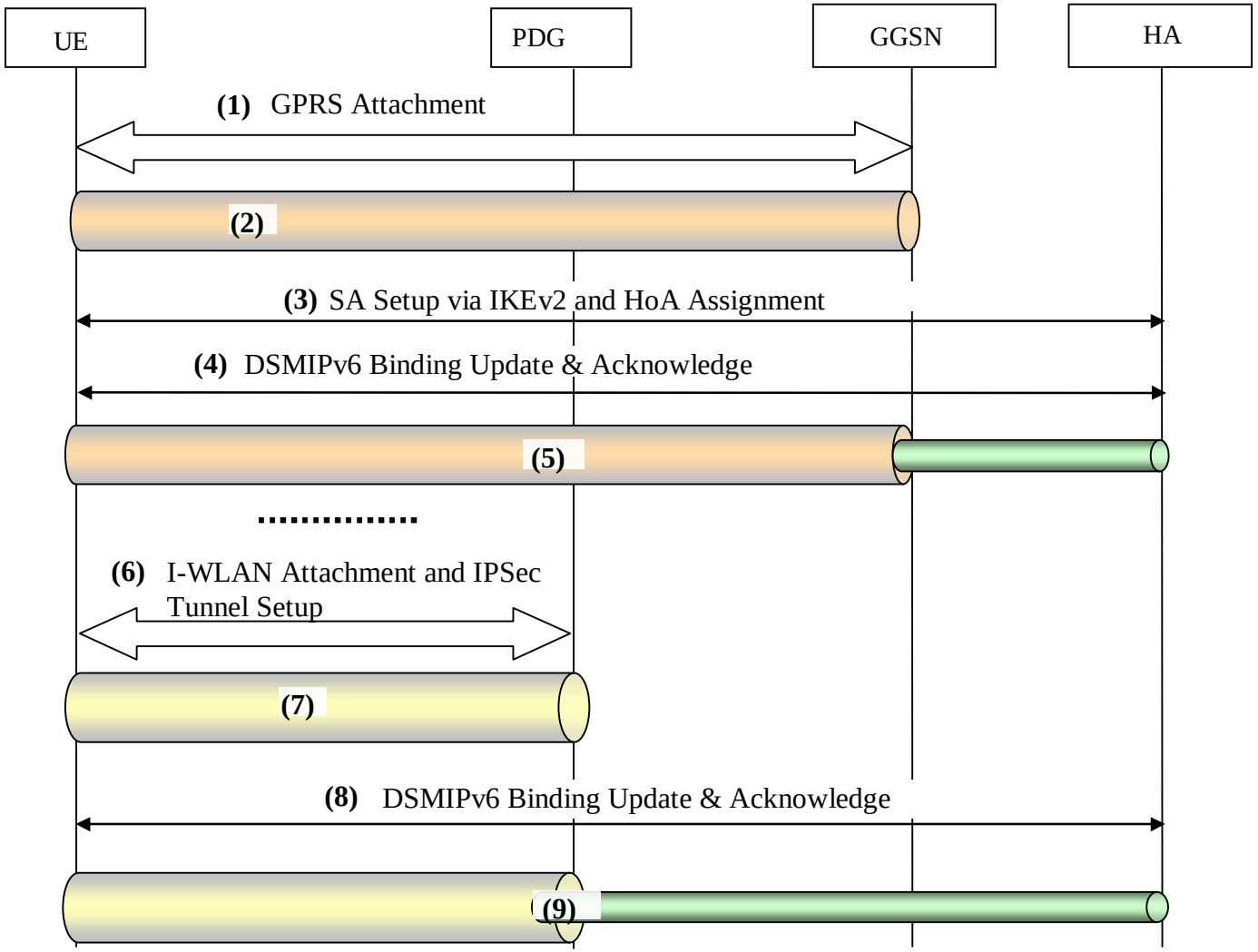
Alternative C：Non-Roaming Architecture for I-WLAN Mobility



Information Flow for Initial Attach in I-WLAN and Subsequent Handover to GPRS



Information Flow for Initial Attach in GPRS and subsequent Handover to I-WLAN



comparison

Same of the Solution A and B：

It is based on GTP tunneling and proposes to use simple mobility mechanisms that are possible because of two simultaneous radios and of IPsec tunneling between UE and network: there is no need for GPRS/UMTS Mobility Management, in particular no need for neither LA/RA nor context transfers. This solution allows the support of multiple PDP contexts (primary and secondary) for a given APN, and also supports multiple APN.

Different of the Solution A and B：

A：Via multiple IPsec tunnels and via triggering PDP context activations. When the UE is in GPRS network, the TTG' either works as a GGSN or a proxy GSN. When the UE is in the WLAN, the TTG' terminates the IPsec tunnel.

B：Via a single IPsec tunnel and via triggering PDP context activations thanks to a simple UE-TTG Session Management protocol. This proposal introduces a NAS Session Management protocol (W-SM) between the UE and the TTG to replace multiple IPsec tunnels by one single IPsec tunnel established at authentication. This solution avoids multiple IPsec tunnel and would allow the maintain of original QoS profile for running sessions when the UE moves between WLAN and GPRS。

Solution C：

(1).Based on the Dual Stack MIPv6

(2).This solution does not include the description of any roaming solution with the associated charging mechanisms.

(3).The solution does not specify any access authentication and authorization procedure.

(4).There are some other drawbacks of this solution, the UE and the HA need to have a DSMIPv6 stack.

(5).The drawback associated with this solution is the lack of commercial implementations available today.