Technical Specification Group Services and System Aspects **TSGS#27(05)0104**
Meeting #27, 14 - 17 March 2005,Tokyo, Japan

Source: **TSG SA WG2**

Title: **CR(s) to 23.002**

Agenda item: **7.2.3**

Document for: **APPROVAL**

S2 Tdoc	Title	Spec	CR	Rev	Cat	C_Ver	Rel	WI
S2-050063	Inclusion of WLAN functionality in HSS description	23.002	148	2	F	6.6.0	Rel-6	WLAN
S2-050522	Generalising Subscriber Location Function (SLF) to support WLAN and Removal of WLAN charging reference points and functional entities	23.002	153		F	6.6.0	Rel-6	WLAN

3GPP TSG-SA2 Meeting #44
26 January – 2 February, 2005

Tdoc S2-050063

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.002** **CR** **148** ⌘ **rev** **2** ⌘ Current version: **6.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Inclusion of WLAN functionality in HSS description
Source:	⌘	3GPP TSG_SA WG2
Work item code:	⌘	WLAN
Date:	⌘	07/01/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change:	⌘	Add support via the Wx or D/Gr interfaces to the description of the HSS. Additionally, correct the inclusion of the D'/Gr/ interface to reflect actual specification.
Summary of change:	⌘	Subclause 4.1.1.1.1 is amended to include support for D'/Gr' interface functionality, and subclause 4.1.1.1.3 is amended to include support for Wx interface functionality. Subclause 6a.9.1 is amended with regard to the release the HLR is addressed at.
Consequences if not approved:	⌘	Essential functionality provided by the HLR and HSS to WLAN entities is not included in the description of those entities.

Clauses affected:	⌘	4.1.1.1.1, 4.1.1.1.3, 6a.9.1

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

NEXT CHANGE

4.1.1.1 The Home Subscriber Server (HSS)

The HSS is the master database for a given user. It is the entity containing the subscription-related information to support the network entities actually handling calls/sessions.

A Home Network may contain one or several HSSs: it depends on the number of mobile subscribers, on the capacity of the equipment and on the organisation of the network.

As an example, the HSS provides support to the call control servers in order to complete the routing/roaming procedures by solving authentication, authorisation, naming/addressing resolution, location dependencies, etc…

The HSS is responsible for holding the following user related information:

- User Identification, Numbering and addressing information.
- User Security information: Network access control information for authentication and authorization
- User Location information at inter-system level: the HSS supports the user registration, and stores inter-system location information, etc.
- User profile information

The HSS also generates User Security information for mutual authentication, communication integrity check and ciphering.

Based on this information, the HSS also is responsible to support the call control and session management entities of the different Domains and Subsystems (defined in section 3.3 and 3.3a) of the operator as shown in Figure 0-a.

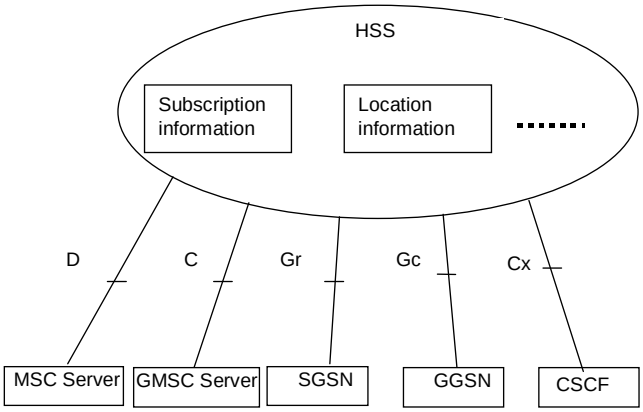


Figure 0-a: Example of a Generic HSS structure and basic interfaces

The HSS may integrate heterogeneous information, and enable enhanced features in the core network to be offered to the application & services domain, at the same time hiding the heterogeneity.

The HSS consists of the following functionalities:

- IP multimedia functionality to provide support to control functions of the IM subsystem such as the CSCF. It is needed to enable subscriber usage of the IM CN subsystem services. This IP multimedia functionality is independent of the access network used to access the IM CN subsystem.
- The subset of the HLR/AUC functionality required by the PS Domain.

- The subset of the HLR/AUC functionality required by the CS Domain, if it is desired to enable subscriber access to the CS Domain or to support roaming to legacy GSM/UMTS CS Domain networks.

The organisation of the subscriber data is outlined in 3GPP TS 23.008 [5]. It also indicates which numbers, addresses and identifiers specified in TS 23.003 [3] are stored in HSS.

4.1.1.1.1 The Home Location Register (HLR)

The HLR is shown in the Reference Architecture up to and including R4.

The HLR can be considered a subset of the HSS that holds the following functionality:

- The functionality required to provide support to PS Domain entities such as the SGSN and GGSN, through the Gr and Gc interfaces, and the 3GPP AAA Server for the I-WLAN through the D'/Gr' interface. It is needed to enable subscriber access to the PS Domain services.

- The functionality required to provide support to CS Domain entities such as the MSC/MSC server and GMSC/GMSC server, through the C and D interfaces. It is needed to enable subscriber access to the CS Domain services and to support roaming to legacy GSM/UMTS CS Domain networks.

4.1.1.1.2 The Authentication Centre (AuC)

The AuC is shown in the Reference Architecture up to and including Rel-4.

The AuC can be considered a subset of the HSS that holds the following functionality for the CS Domain and PS Domain:

- The AuC is associated with an HLR and stores an identity key for each mobile subscriber registered with the associated HLR. This key is used to generate security data for each mobile subscriber:

  - data which are used for mutual authentication of the International Mobile Subscriber Identity (IMSI) and the network;

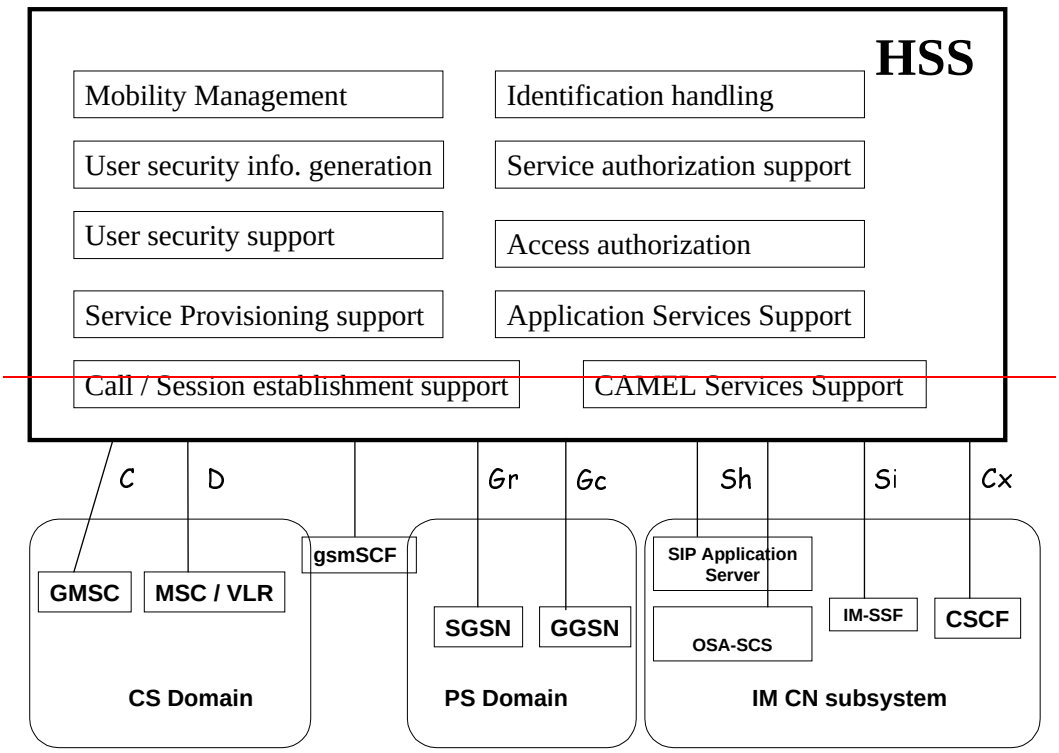
  - a key used to check the integrity of the communication over the radio path between the mobile station and the network;

  - a key used to cipher communication over the radio path between the mobile station and the network.

- The AuC communicates only with its associated HLR over a non-standardised interface denoted the H-interface. The HLR requests the data needed for authentication and ciphering from the AuC via the H-interface, stores them and delivers them to the VLR and SGSN which need them to perform the security functions for a mobile station.

4.1.1.1.3 HSS logical functions

This section provides a high level and not exhaustive description of HSS functionality.



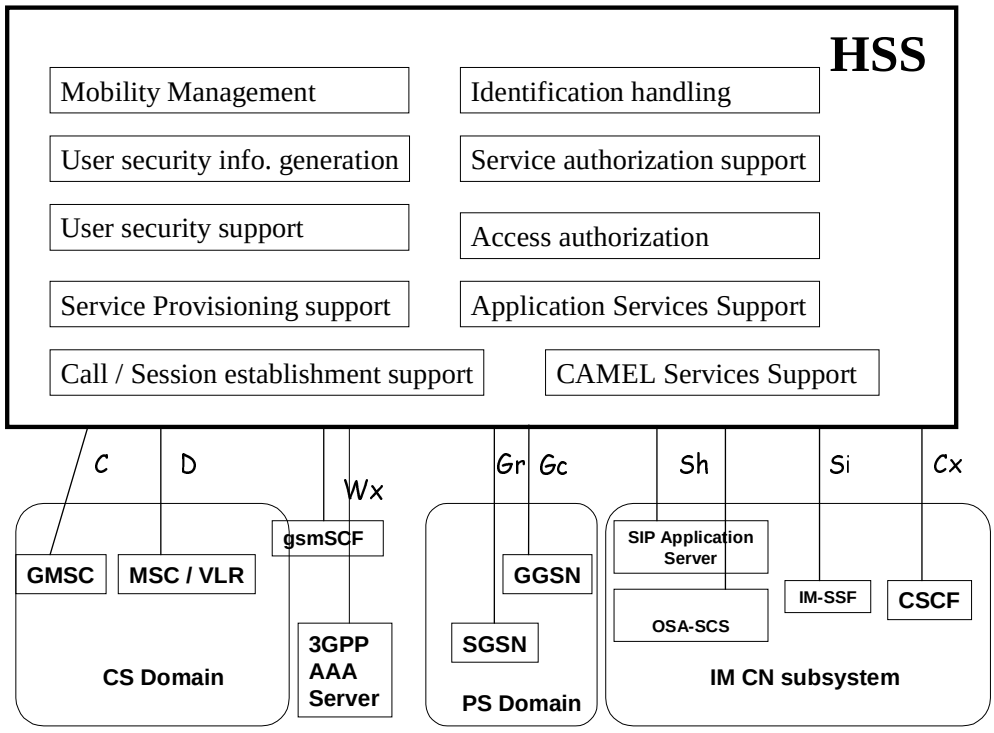


Figure 0.b – HSS logical functions

- Mobility Management

  This function supports the user mobility through CS Domain, PS Domain and IM CN subsystem.

- Call and/or session establishment support

The HSS supports the call and/or session establishment procedures in CS Domain, PS Domain and IM CN subsystem. For terminating traffic, it provides information on which call and/or session control entity currently hosts the user.

- User security information generation

- The HSS generates user authentication, integrity and ciphering data for the CS and PS Domains and for the IM CN subsystem. User security support

  The HSS supports the authentication procedures to access CS Domain, PS Domain and IM CN subsystem services by storing the generated data for authentication, integrity and ciphering and by providing these data to the appropriate entity in the CN (i.e. MSC/VLR, SGSN, 3GPP AAA Server or CSCF)..

- User identification handling

  The HSS provides the appropriate relations among all the identifiers uniquely determining the user in the system: CS Domain, PS Domain and IM CN subsystem (e.g. IMSI and MSISDNs for CS Domain; IMSI, MSISDNs and IP addresses for PS Domain, private identity and public identities for IM CN subsystem).

- Access authorisation

  The HSS authorises the user for mobile access when requested by the MSC/VLR, SGSN, 3GPP AAA Server or CSCF, by checking that the user is allowed to roam to that visited network.

- Service authorisation support

  The HSS provides basic authorisation for MT call/session establishment and service invocation. Besides, the HSS updates the appropriate serving entities (i.e., MSC/VLR, SGSN, 3GPP AAA Server, CSCF) with the relevant information related to the services to be provided to the user.

- Service Provisioning Support

- The HSS provides access to the service profile data for use within the CS Domain, PS Domain and/or IM CN subsystem.Application Services and CAMEL Services Support

  The HSS communicates with the SIP Application Server and the OSA-SCS to support Application Services in the IM CN subsystem. It communicates with the IM-SSF to support the CAMEL Services related to the IM CN subsystem. It communicates with the gsmSCF to support CAMEL Services in the CS Domain and PS Domain.

NEXT CHANGE

6a.9.1 Reference point 3GPP AAA Server - HLR (D'/Gr' Reference Point)

This is the reference point between the 3GPP AAA server and the ~~pre-Rel6~~ HLR up to and including R4 and the HSS in Rel 5. The functionality of this reference point is similar to that of the Wx reference point. For more information see TS 23.234 [67].

3GPP TSG-SA2 Meeting #44
26 January – 2 February, 2005

Tdoc S2-050522

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.002** **CR** **153** ⌘ **rev** ⌘ Current version: **6.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: | UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Generalising Subscriber Location Function (SLF) to support WLAN and Removal of WLAN charging reference points and functional entities
Source:	⌘	3GPP TSG_SA WG2
Work item code:	⌘	WLAN
Date:	⌘	07/01/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	[H1 3GPP 23.234 and 29.234 are now making use of the optional SLF functionality to find the appropriate HSS when multiple ones of these exist. Therefore, the SLF should not be defined as an IMS entity (as subclause 4a.7.5). Instead, it should be generalised, and moved to 23.002 subclause 4.1.1, the same subclause as the HSS. 3GPP TS 23.002 does not show existing charging interfaces, and these are left to other documentation. It is therefore inappropriate that charging interfaces are shown for wireless LAN operation, either for the online charging or for the offline charging. These are currently shown in figure 8 (OCS and CGw/CCF functional entities and Wo and Wf reference points). The WLAN architecture and WLAN reference points also need updating.
Summary of change:	⌘	Subclause 4.1.1 is revised to include a new subclause defining the SLF. The SLF definition is removed from subclause 4a.7. The SLF is added to figure 8, accessed using the Dw reference point, and the charging entities are removed. Subclause 6a.9 is revised to include the Dw reference point.
Consequences if not approved:	⌘	Definition of the SLF in 3GPP TS 23.002 is inconsistent with the approved definition in 3GPP TS 23.234.

Clauses affected:	⌘	4.1.1.7 (new), 4a.7.5, 5.7, 6a.9.12(new)
Other specs	⌘	Y: ☐ N: **X** Other core specifications ⌘

affected:		X	Test specifications
		X	O&M Specifications
Other comments:	⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

ADDED TEXT

4.1.1.7 Subscription Locator Function (SLF)

The SLF:

- Is queried by the I-CSCF during the Registration and Session Setup to get the name of the HSS containing the required subscriber specific data. Furthermore the SLF is also queried by the S-CSCF during the Registration.
- Is queried by the AS in conjunction with the Sh interface operation to get the name of the HSS containing the required subscriber specific data.
- Is queried by the 3GPP AAA server to get the name of the HSS containing the required subscriber specific data.
- Is accessed via the Dx interface by the CSCF, via the Dh interface by the AS, and via the Dw interface by the 3GPP AAA Server.

The SLF is not required in a single HSS environment. An example for a single HSS environment is a server farm architecture. Use of SLF is not required when AS are configured/managed to use pre-defined HSS.

NEXT CHANGE

4a.7.5 ~~Subscription Locator Function (SLF)~~Void

~~The SLF:~~

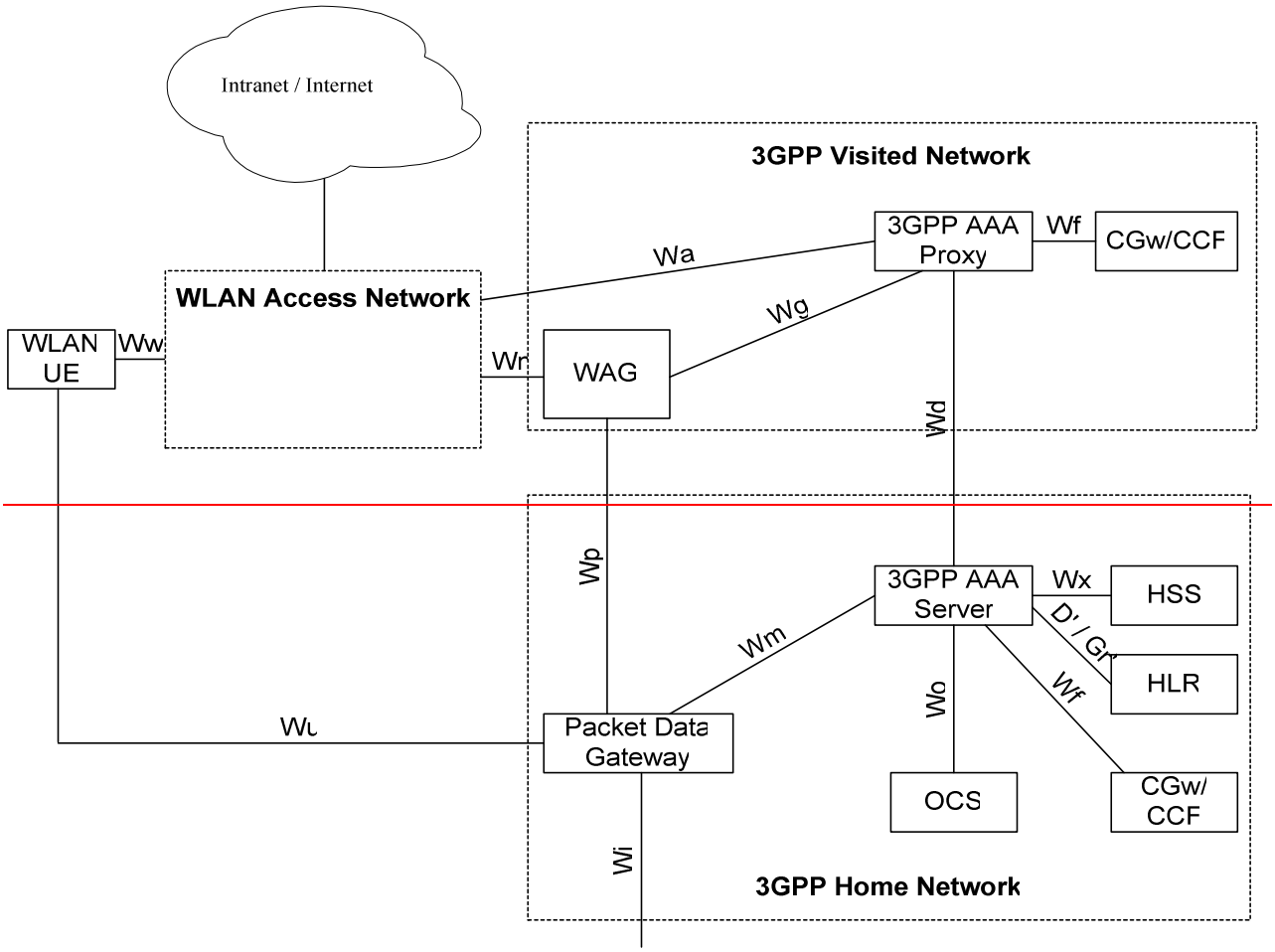
- ~~Is queried by the I-CSCF during the Registration and Session Setup to get the name of the HSS containing the required subscriber specific data. Furthermore the SLF is also queried by the S-CSCF during the Registration.~~
- ~~Is queried by the AS in conjunction with the Sh interface operation to get the name of the HSS containing the required subscriber specific data.~~
- ~~Is accessed via the Dx interface by the CSCF and via the Dh interface by the AS~~

~~The SLF is not required in a single HSS environment. An example for a single HSS environment is a server farm architecture. Use of SLF is not required when AS are configured/managed to use pre-defined HSS.~~

NEXT CHANGE

5.7 Configuration of 3GPP/WLAN Interworking

The configuration of the 3GPP/WLAN interworking function is presented in figure 8. The figure shows all network entities and reference point for the roaming scenario when a WLAN UE accesses PS based services in the home network. PS based services in the visited network are accessed via a Packet Data Gateway in the visited 3GPP network. Reference point Ww between WLAN UE and WLAN is outside the scope of 3GPP and only shown for completeness.


Intranet / Internet
3GPP Visited Network
3GPP AAA Proxy
Wf
CGw/CCF
Wa
WLAN Access Network
Wg
WLAN UE
Ww
Wr
WAG
Wd
Wp
3GPP AAA Server
Wx
HSS
Wm
D' / Gr'
HLR
Wo
Wf
Wu
Packet Data Gateway
OCS
CGw/ CCF
Wi
3GPP Home Network

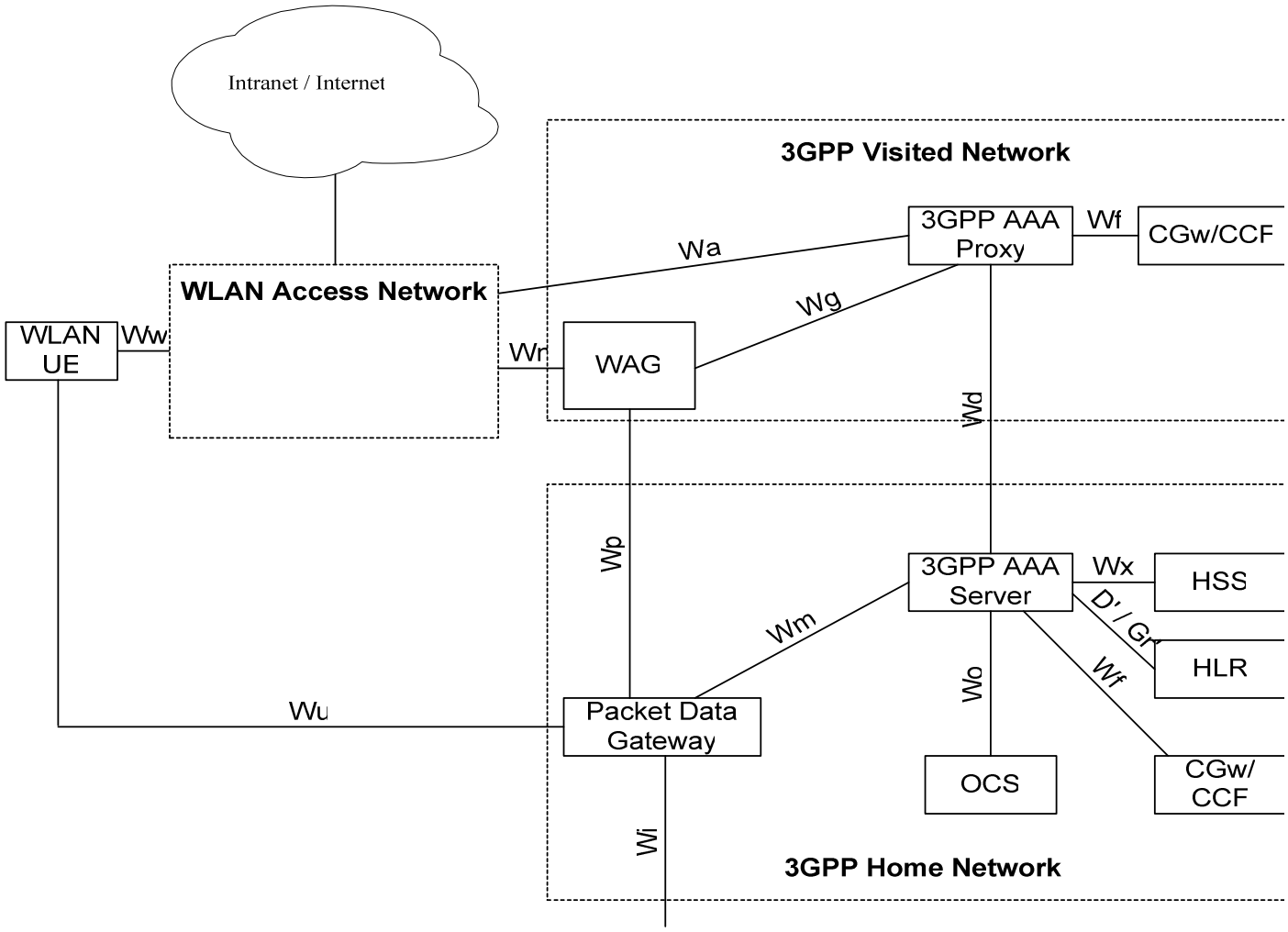


Figure 8:Configuration of a 3GPP/WLAN interworking function

NEXT CHANGE – ADDED TEXT

6a.9.12 Reference point 3GPP AAA Server - SLF (Dw reference point)

This reference point is between the 3GPP AAA Server and the SLF. The prime purpose of the protocol(s) crossing this reference point is to enable the 3GPP AAA Server to find the address of the HSS which holds the subscriber data for a given user identity in a configuration with multiple separately addressable HSSs.