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# Software Requirement Specification Document

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Home Subscriber Server SRS

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Version 1.0

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**Document Information****Document Sign Off****Document Sign Off**

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**Document Purpose**

The information provided in this document explains both functional and non functional requirements for HSS and supported reference points. It clearly identifies the requirements and contains detailed information about it. For complete scope of HSS please see the **Project Proposal**.

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# 1. References & Abbreviations

## 1.1 References

Following is the 3GPP reference document list, which are related to the information present in this document:

[1] 3GPP TS 29.228: " IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents".

[2] 3GPP TS 23.002: "Network Architecture".

## 1.2 Abbreviations

Following are the abbreviations that have been used in the document:

<b>CDR</b>	Charging Data Record
<b>OCS</b>	Online Charging System
<b>3GPP</b>	Third Generation Partnership Protocol
<b>IMS</b>	IP Multimedia Subsystem
<b>CGF</b>	Charging Gateway Function
<b>CDF</b>	Charging Data Function
<b>CTF</b>	Charging Trigger Function
<b>UMTS</b>	Universal Mobile Telecommunications System
<b>HSS</b>	Home Subscriber Server
<b>GPRS</b>	General Packet Radio Service
<b>GSM</b>	Global System For Mobile Communications

## 2. Project Overview

The Home Subscriber Server, in its basic role, is a centralized database for IMS, Packet Switched (PS) and Circuit Switched (CS) entities. These entities include CSCFs, AS, GPRS Support Nodes and MSCs.

The Home Subscriber Server (HSS) is core network entity that plays a very central role in user authentication, authorization and session management. The HSS along with call state control functions completes IMS Control Layer functionality for subscription and session management. The HSS Server supports different interfaces to the IMS network, PS/GPRS network, CS/GSM network and general purpose IP network. The HSS Server contains user information necessary for call control mechanism in IMS and other networks (GPRS, GSM or Internet). The Call State Control Functions query HSS over Cx/Dx DIAMETER Interface in IMS network for retrieving of subscription, authentication, authorization and services profiles related data. This data helps these entities in providing the secure and authorized call control over IMS network. The Application Servers query HSS over Sh Interface for service specific data for a particular subscriber using DIAMETER commands. Similarly the IM-SSF can query HSS over Si DIAMETER interface for CAMEL specific service data. The PS (GPRS) and CS (GSM/UMTS) domains entities interact with HSS over Gr/Gc MAP interfaces. The home subscriber server hosts DIAMETER and MAP applications for communicating with IMS entities and GPRS/GSM/UMTS entities respectively. These applications receive requests and generate response to the caller applications.

In this project we will be implementing the HSS for IMS entities only.

The HSS will be responsible for holding the following user related information for IMS Network:

- User Identification, Numbering and addressing information;
- User Security information: Network access control information for authentication and authorization;
- User Location information at inter-system level
- 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

In addition to providing the Requirement Specifications for the HSS, this document also provides the Requirement Specifications for three Reference points used for communication to/from the HSS/SLF and other IMS entities. These three reference points are the following:

1) Cx Reference Point

The Cx Reference point describes the interface between the I-CSCF/S-CSCF and the HSS.

2) Dx Reference Point

The Dx Reference point describes the interface between the I-CSCF/S-CSCF and the SLF.

3) Sh Reference Point

The Sh Reference point describes the interface between an AS / SCS and the HSS.

## 3. Functional Requirements

Following are the functional requirements of Home Subscriber Server.

### 3.1 Home Subscriber Server

#### Requirement: 1 - 3GPP Compliance

<b>ID</b>	DIM – 00150
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	3GPP compliance.
<b>Description</b>	The HSS will be compliant with the IMS entities standardized by 3GPP.

#### Requirement: 2 - Support for Authentication & Ciphering

<b>ID</b>	DIM – 00156
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support for Authentication & Ciphering.
<b>Description</b>	The HSS implementation will provide full support for following authentication schemes: - Authentication and Key Agreement (AKA). - HTTP Digest.

#### Requirement: 3 - Support for MySQL database

<b>ID</b>	DIM – 00153
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support for MySQL database.
<b>Description</b>	The HSS implementation will natively support the MySQL DBMS as the actual data repository.

#### Requirement: 4 - Support for Routing & Addressing

<b>ID</b>	DIM – 00155
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support for routing & addressing.
<b>Description</b>	The HSS implementation will provide full support for the routing and addressing specified in the 3GPP TS 23.002 specification.

**Requirement: 5 - Support of Authentication & Authorization**

<b>ID</b>	DIM – 00152
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support of authentication & authorization.
<b>Description</b>	The HSS implementation should provide full support for the authentication and authorization functionality specified in 3GPP TS 29.228 specification.

**Requirement: 6 - Support of Cx, Dx and Sh Reference Points**

<b>ID</b>	DIM – 00151
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support of Cx, Dx and Sh Reference Points.
<b>Description</b>	The HSS will fully implement the functionality of Cx, Dx and Sh Reference Points as specified by the 3GPP.

**Requirement: 7 - Support of Subscriber Profiles & Service Profiles**

<b>ID</b>	DIM – 00154.
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Support of Subscriber Profiles & Service Profiles.
<b>Description</b>	The HSS implementation will fully support the storage and retrieval of Subscriber Profiles and Service Profiles.

**3.2 Reference Points Supported****3.2.1 Cx/Dx Reference Point****Requirement: 1 - Features to be implemented on Cx/Dx interfaces**

<b>ID</b>	DIM – 00162
<b>Group Name</b>	Cx/Dx Reference Point.
<b>Name</b>	Features to be implemented on Cx/Dx interfaces.
<b>Description</b>	The following features will be implemented on the Cx/Dx interfaces : a) User Registration Status Query b) SCSCF-Registration/De-Registration Notification c) Network Initiated De-Registration d) User Location Query e) Authentication Procedures

**Requirement: 2 - Primitive operations to be implemented on Cx/Dx reference points**

<b>ID</b>	DIM – 00163
<b>Group Name</b>	Cx/Dx Reference Point.
<b>Name</b>	Primitive operations to be implemented on Cx/Dx reference points.
<b>Description</b>	The following primitive operations will be implemented on the Cx/Dx reference points: a) Cx-Query b) Cx-Select-Pull c) Cx-Put e) Cx-Pull f) Cx-Deregister g) Cx-Location-Query h) Cx-AV-Req

**3.2.2 Sh Reference Point****Requirement: 1 - Features to be implemented on Sh reference point**

<b>ID</b>	DIM – 00164
<b>Group Name</b>	Sh Reference Point.
<b>Name</b>	Features to be implemented on Sh reference point.
<b>Description</b>	The following features will be implemented on the Sh reference point: a) Reading Data b) Data Update c) Subscription To Notifications d) Notifications

**Requirement: 2 - Primitive operations to be implemented on Sh reference point**

<b>ID</b>	DIM – 00165
<b>Group Name</b>	Sh Reference Point.
<b>Name</b>	Primitive operations to be implemented on Sh reference point.
<b>Description</b>	The following primitives will be implemented on the Sh Reference point: a) Sh-Pull b) Sh-Update c) Sh-Subs-Notif d) Sh-Notif

## 4. Non-Functional Requirements

Following are the non-functional requirements of Home Subscriber Server.

### Requirement: 1- Database extensibility for CS and PS domain entities' information requirements

<b>ID</b>	DIM – 00158
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Database Schema extensibility for CS and PS domain entities' information requirements.
<b>Description</b>	The Database design/schema of the HSS will be flexible enough to support the CS and PS entities in the future.

### Requirement: 2 - Easy to use HSS configuration application will be provided

<b>ID</b>	DIM – 00159
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Easy to use HSS configuration application will be provided.
<b>Description</b>	An easy to use application will be provided to configure the HSS.

### Requirement: 3 - Extensibility for other IMS, CS and PS cores related interfaces

<b>ID</b>	DIM – 00157
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Extensibility for other IMS, CS and PS cores related interfaces.
<b>Description</b>	The HSS (design and architecture will be generic/open) for extensibility for further IMS , CS and PS entities specific interfaces to be supported over the same architecture and design

### Requirement: 4 – Performance metrics to be adhered to for HSS

<b>ID</b>	DIM – 00161
<b>Group Name</b>	Home Subscriber Server.
<b>Name</b>	Performance metrics for number of concurrent diameter messages
<b>Description</b>	The HSS will provide acceptable performance without degrading for a maximum of 500 concurrent diameter messages overall all of the reference points implemented on it.

## 5. Operating Environment Requirements

The system will primarily be developed and tested on Linux/Unix based Operating Systems. But our goal is to make it a platform independent solution. The target platforms are:

- Linux ,
- Microsoft Windows &
- Solaris.