Subscriber Data Management

Release 9.1

Feature Notice

910-6694-001 Revision A
April 2013

Tekelec

Subscriber Data Management (SDM) - IMS/LTE Home Subscriber Server (HSS) Copyright, Notice, Trademarks, and Patents

Subscriber Data Management (SDM) - Next-generation Home Location Register (HLR) Copyright, Notice, Trademarks, and Patents

Subscriber Data Management (SDM) - User Data Repository (UDR) Copyright, Notice, Trademarks, and Patents

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1

Subscriber Data Management

Topics:

This document includes a brief description on the SDM Product, an overview of the hardware platform, an overview of the software architecture, new feature descriptions, and explains how to find customer documentation on the Customer Support Site.

Introduction

Subscriber Data Management is used to consolidate and manage cross-domain subscriber data as a single logical profile. Data is stored in the back-end database, which supports multiple front-end applications.

Feature notices are distributed to customers with each new release of software.

This *Feature Notice* includes the following topics:

- *SDM Description*
- *Hardware Platform Overview*
- *Software Architecture*
- *New and Enhanced Features*

For further details on the SDM product and on each feature covered in this document, refer to the SDM Customer Documentation set's Product Description. The SDM Documentation Roadmap should be your document of reference to get the list of all the SDM Customer Documents available and a description of each of their purpose. This will map you to the right document based on the type of information you need. For instructions on how to locate the SDM Customer Documentation, go to this section: *Locate Product Documentation on the Customer Support Site*

SDM Description

The Tekelec Subscriber Data Management (SDM) product family is a multi-profile subscriber management system, designed with an objective to consolidate all the information (or profiles) of a mobile subscriber. It enables centralization of subscriber information/data in one logical place and convergence of subscriber's registration, authentication and call termination at the core of the network, regardless of the access domain (including GSM/UMTS, IMS, SIP, LTE, and others).

The evolved Subscriber Data Management (SDM) solution features a distributed and layered architecture that provides a scalable back-end database, the Subscriber Data Server (SDS), which centralizes subscriber data from multiple front ends such as these applications: 3GPP ngHLR and AuC functions, MNP, SIP-AS, IMS-HSS, LTE-HSS, EIR, LTE-EIR, ENUM, 3GPP AAA (WiMAX AAA), and SPR. In other releases, it can also include other functional elements, or network applications, as depicted in this figure.
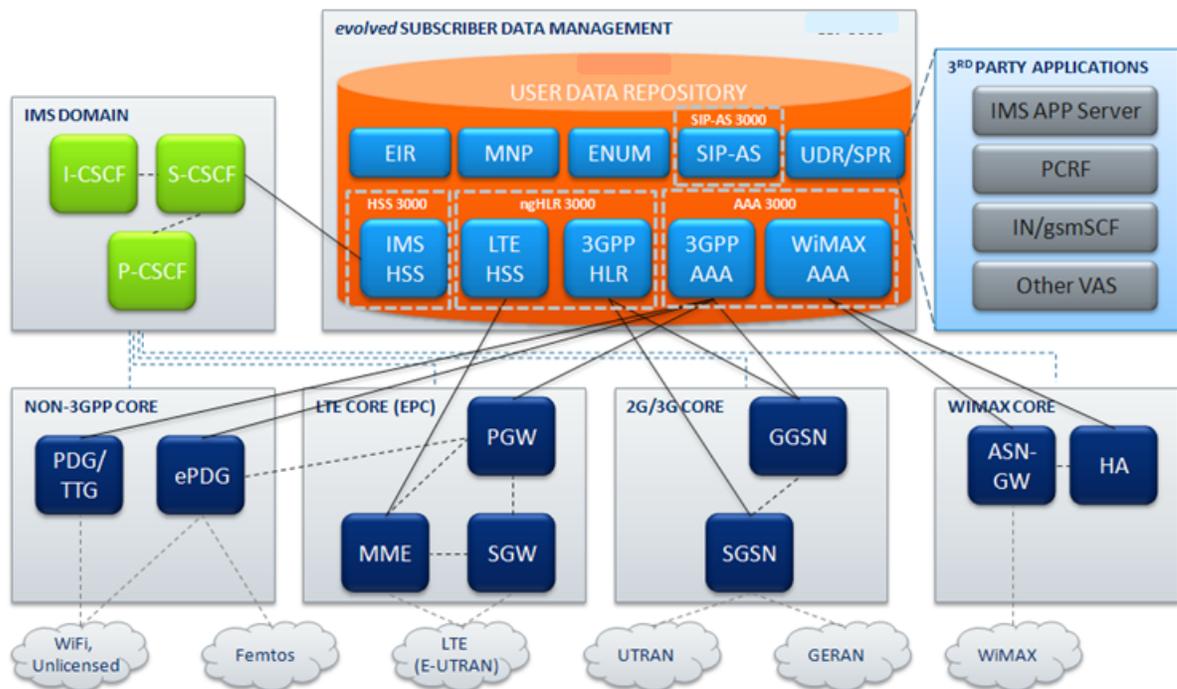
Figure 1: The SDM and typical network architecture

Hardware Platform Overview

The Tekelec Subscriber Data Management (SDM) software solution supports one software stream and can use one of the following hardware platforms:

The EAGLE XG hardware used for the Subscriber Data Management (SDM) application is available for AC and DC power. The hardware consists of the following cabinets and components depending on customer-specific configurations:

- Cabinets

  - HP Enterprise cabinet (AC)
  - Telect CoreMAX seismic cabinet (DC)

- Power distribution units (AC) or panels (DC)

  - HP AC PDU
  - Telect 100A 4-Position Demarcation DC PDP
  - Telect 100A Dual feed DC PDP

- Cisco 4948E/4948E-F aggregation switch
- HP c7000 enclosure with

  - Onboard Administrator
  - Cisco 3020 blade switch
  - HP BL460 G6/Gen8 blade server
  - D2200sb storage blade

- HP DL360 G6 rackmount server
- HP DL380 G6/Gen8 rackmount management/application server
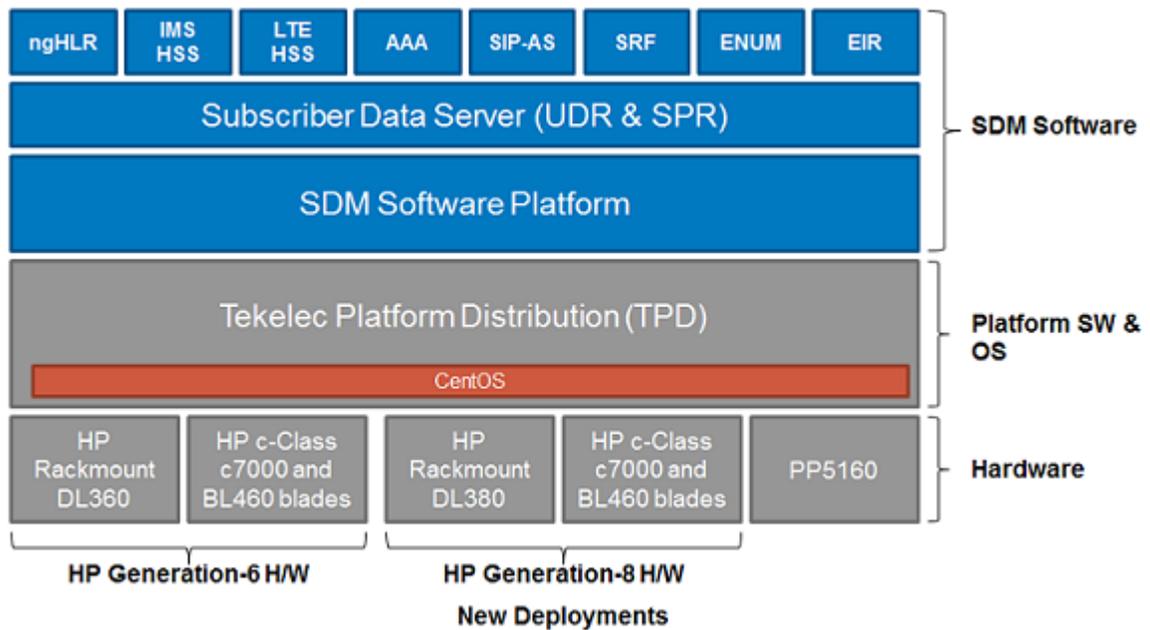
Figure 2: Hardware Platforms

Software Architecture

The figure shows a high level view of the SDM software architecture.
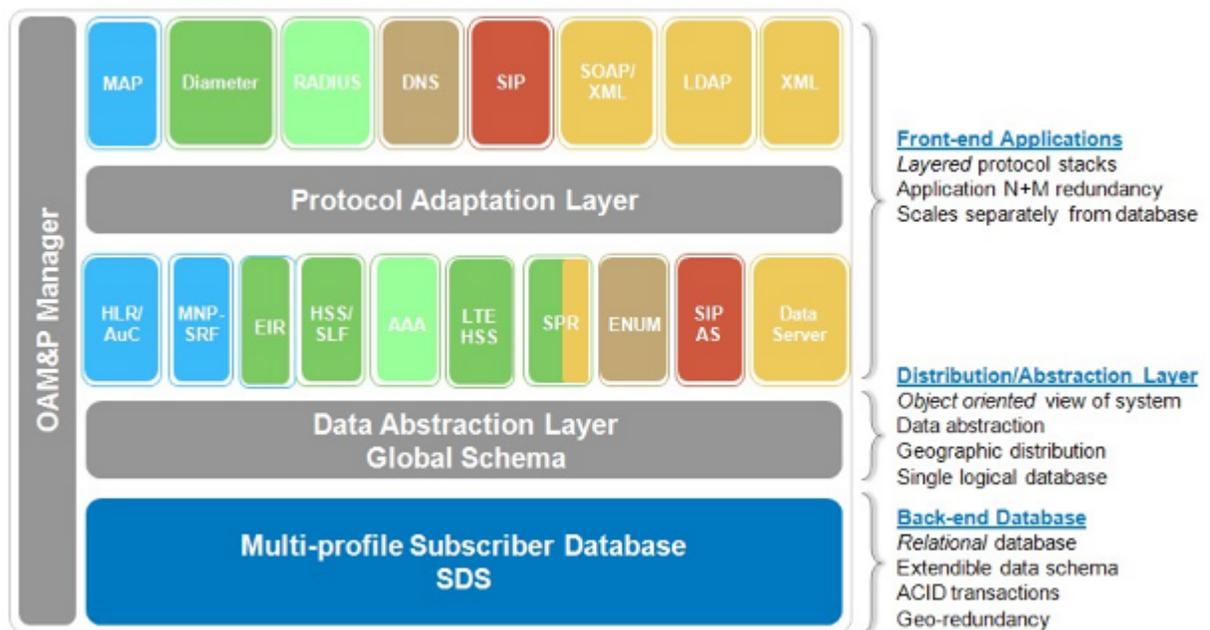
Figure 3: SDM high level software architecture

The system can be composed of up to 2 slots for rackmount Single Board Computers (SBC), and up to 16 slots for blade SBCs. This means that up to two or sixteen slots can have assigned SBCs that offer services.

Note: The number of HP server/storage blades supported depends on the configuration of the system.

Chapter

2

New and Enhanced Features

Topics:

Mobile Terminated Roaming Retry

The *Mobile Terminated Roaming Retry* feature enhances the ngHLR to support Mobile Terminating Roaming Retry (MTRR) calls for Send Routing Information (SRI) messages in the following scenarios:

• After successful retrieval of routing information
• During retrieval of routing information

This is in accordance with capabilities outlined in *sections 5.2.1 and 5.2.2 of the 3GPP standard TS 23.018 version 9.4.0 (Release 9).*

In the ngHLR this feature adds two major changes:

• In the provide roaming number (PRN) message, the ngHLR will forward the mobile terminated (MT) Retry Supported informational element (IE) that was received in the SRI message
• Incoming SRI messages for a subscriber will be held, in the ngHLR, until the update location (UL) message for that subscriber has completed

This feature covers SRI messages only.

By default the mobile terminated retry feature is unavailable. The network operator needs to call Customer Care to make it available. Once available it can be dynamically activated or deactivated by the network operator.

This table indicates the feature impact on the system:

New Alarms	New Error Messages	New Counters	New Hardware	New Configuration tables/attributes	New Subscriber Provisioning tables/attributes	New Network/Subscriber Provisioning interfaces
N	N	N	N	Y/Y	N/N	N/N

For more information about this feature, refer to the *Mobile Terminated Roaming Retry* section in the *Product Description* of your SDM 9.1 documentation set.

SLh Interface Support for Location Services

The *Diameter SLh Interface* connects the Gateway Mobile Location Center (GMLC) and the Home Subscriber Server (HSS).

It allows the GMLC to request routing information from the HSS. The routing information can include the H-GMLC address, the address of the visited MSC/MSC server, SGSN or the MME for a particular target user equipment (UE) whose location has been requested.

This feature enhances the LTE-HSS to support Diameter LCS Routing Info Request (RIR) and LCS Routing Info Answer (RIA) response exchanges.

Using the GMLCNodeList the operator can define valid GMLC nodes that will be allowed to query the HSS. These nodes are used to validate the GMLC number contained in the RIR (Routing Info Request) to ensure it belongs to a network authorized to request User Equipment (UE) information.

This table indicates the feature impact on the system:

New Alarms	New Error Messages	New Counters	New Hardware	New Configuration tables/attributes	New Subscriber Provisioning tables/attributes	New Network/Subscriber Provisioning interfaces
N	N	Y	N	Y/Y	N/N	N/N

For more information about this feature refer to the *LTE-HSS interfaces* section in the *Product Description* of your SDM 9.1 documentation set.

Logging Mechanism for the LTE-HSS

Diameter messages are processed by the LTE-HSS. This feature provides a mechanism to log events associated with diameter messages in real time. The operator can dynamically activate or deactivate LTE-HSS logging.

When LTE-HSS logging has been activated, a line describing the event is added to a log file when one of the following types of diameter message query is received by the LTE-HSS:

- Location Update Request
- Authentication Information Request
- Notify Request
- Purge UE Request
- Cancel Location Request

The log file is in comma-separated values (CSV) format and is stored on the front end blade of the LTE-HSS. When LTE-HSS logging is deactivated no log file is created.

This table indicates the feature impact on the system:

New Alarms	New Error Messages	New Counters	New Hardware	New Configuration tables/attributes	New Subscriber Provisioning tables/attributes	New Network/Subscriber Provisioning interfaces
N	N	N	N	Y/Y	N/N	N/N

For more information about the Logging Mechanism for the LTE-HSS , refer to the *LTE-HSS logs* section in the *Product Description* of your SDM 9.1 documentation set.

Multiple Realm Support for the LTE-HSS

The *multiple realm* feature allows the LTE-HSS to support multiple realms and can be used when interacting with nodes in more than one network. It is dynamically activated or deactivated by the network operator. It does not need to be activated before the new LTE-HSS Realms table is provisioned.

In the LTE-HSS Realms table a host, an IMSI range and a realm may be defined. Each IMSI range is associated with a specific host and realm value.

When the feature is activated diameter requests are handled as follows:

- When the LTE HSS receives a diameter request message and that message contains a destination host and destination realm these values are used as the origin host and original realm in the response. The LTE-HSS Realms table is not used.
- When the LTE HSS receives a diameter request message and that message does not contain a destination host then the LTE-HSS searches the LTE-HSS Realms table and uses the best match algorithm IMSI to find the host name that will be used in the response as the origin host. If no host is found then the LTE-HSS will use the default host as the origin host in the response.
- The LTE-HSS initiates some request messages. Examples of these are IDR (Insert Subscriber Data Request), DSR (Delete Subscriber Data Request) and CLR (Cancel Location Request). In this case, the LTE-HSS uses the IMSI in the request message, to look up the table using the best match IMSI algorithm to find the origin host and original realm values to send in the request message.

When the feature is deactivated, and the LTE-HSS receives a diameter request message from a peer node, the LTE-HSS does not look at the LTE-HSS Realms table. The diameter response contains the default host and default realm values that are defined in the LTE-HSS configuration.

This table indicates the feature impact on the system:

New Alarms	New Error Messages	New Counters	New Hardware	New Configuration tables/attributes	New Subscriber Provisioning tables/attributes	New Network/Subscriber Provisioning interfaces
N	N	N	N	Y/Y	N/N	N/N

For more information about Multiple Realm Support for the LTE-HSS, refer to the *LTE-HSS* section in the *Product Description* of your SDM 9.1 documentation set.

Enhanced SCCP Allowed PLMN

When the ngHLR receives a MAP message that is from a VLR or an SGSN the way it is handled depends on the MAP message numbering plan of the SCCP called party address. If the SCCP called party address message numbering plan is E.164 or E. 214 and there is no match between the country code (CC) or national destination code (NDC) of the called party SCCP address and the HLR Global Title (GT) Number then the message is rejected.

With this feature the SCCP country code (CC) and national destination code (NDC) is compared to a new Allowed PLMN CC/NDC list that is associated with each Intra PLMN IMSI Range. The Allowed PLMN CC/NDC list consists of all the HPLMN nodes that are type" HPLMN Check and Allowed PLMN" or "Allowed PLMN".

If there is no match between the CC/NDC and the Allowed PLMN list then the message is rejected and an error message is sent.

If there is a match between the CC/NDC, and one HPLMN in the Intra PLMN IMSI range, the message is allowed. The associated HLR number is the calling party address in the response.

If there is a match between the CC/NDC, and more than one HPLMN in the Intra PLMN IMSI range, the message is allowed. The default HLR Number (with the lowest HlrNumberConfigId) is the calling party address in the response.

This table indicates the feature impact on the system:

New Alarms	New Error Messages	New Counters	New Hardware	New Configuration tables/attributes	New Subscriber Provisioning tables/attributes	New Network/Subscriber Provisioning interfaces
N	N	N	N	Y/Y	N/N	N/N

For more information about the Enhanced SCCP Allowed PLMN, refer to the *Enhanced SCCP Allowed PLMN* section in the *Product Description* of your SDM 9.1 documentation set.

Chapter

3

Tekelec Resources and Services

Topics:

Tekelec provides a number of resources for SDM family. These include the availability of product documentation online, customer training, and access to the Customer Care Center.

Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

  Phone:

  1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

  1-919-460-2150 (outside continental USA and Canada)

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

  Phone:

  +1-919-460-2150

  TAC Regional Support Office Hours (except Brazil):

  10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

  - **Argentina**

    Phone:

    0-800-555-5246 (toll-free)

  - **Brazil**

    Phone:

    0-800-891-4341 (toll-free)

    TAC Regional Support Office Hours:

    8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

  - **Chile**

Phone:

1230-020-555-5468

- **Colombia**

Phone:

01-800-912-0537

- **Dominican Republic**

Phone:

1-888-367-8552

- **Mexico**

Phone:

001-888-367-8552

- **Peru**

Phone:

0800-53-087

- **Puerto Rico**

Phone:

1-888-367-8552 (1-888-FOR-TKLC)

- **Venezuela**

Phone:

0800-176-6497

- **Europe, Middle East, and Africa**

Regional Office Hours:

8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

- **Signaling**

Phone:

+44 1784 467 804 (within UK)

- **Software Solutions**

Phone:

+33 3 89 33 54 00

- **Asia**

- **India**

Phone:

+91-124-465-5098 or +1-919-460-2150

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

- **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Customer Training

Tekelec offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate, and maintain Tekelec products. To enroll in any of the courses or for schedule information, contact the Tekelec Training Center at (919) 460-3064 or E-mail `training@tekelec.com`.

A complete list and schedule of open enrollment can be found at `www.tekelec.com`.

Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at www.adobe.com.

1. Log into the *Tekelec Customer Support* site.

   Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Glossary

#

3GPP

    3rd Generation Partnership Project. The standards body for wireless communications.

A

AAA

    Authentication, Authorization, and Accounting (Rx Diameter command)

AS

    Application Server

    A logical entity serving a specific Routing Key. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The AS contains a set of one or more unique Application Server Processes, of which one or more normally is actively processing traffic.

AuC

    Authentication Center

C

CC

    Country Code

CSV

    Comma-separated values

    The comma-separated value file format is a delimited data format that has fields separated by the comma character and records separated by newlines (a newline is a special character or sequence

C

of characters signifying the end of
a line of text).

E

EIR   Equipment Identity Register

A network entity used in GSM
networks, as defined in the 3GPP
Specifications for mobile networks.
The entity stores lists of International
Mobile Equipment Identity (IMEI)
numbers, which correspond to
physical handsets (not subscribers).
Use of the EIR can prevent the use
of stolen handsets because the
network operator can enter the IMEI
of these handsets into a 'blacklist'
and prevent them from being
registered on the network, thus
making them useless.

ENUM   T**E**lephone **NU**mber **M**apping

G

GSM   Global System for Mobile
                                               Communications

H

HSS   Home Subscriber Server

A central database for subscriber
information.

I

IMS   IP Multimedia Subsystem

These are central integration
platforms for controlling mobile
communications services, customer
management and accounting for
mobile communications services
based on IP. The IMS concept is
supported by 3GPP and the UMTS
Forum and is designed to provide
a wide range of application

I

scenarios for individual and group communication.

| IMSI | International Mobile Subscriber Identity |

L

| LTE | Long Term Evolution |

The next-generation network beyond 3G. In addition to enabling fixed to mobile migrations of Internet applications such as Voice over IP (VoIP), video streaming, music downloading, mobile TV, and many others, LTE networks will also provide the capacity to support an explosion in demand for connectivity from a new generation of consumer devices tailored to those new mobile applications.

M

| MAP | Mobile Application Part |

| MNP | Mobile Number Portability |

| MT | Mobile Terminated |

All transmissions that reach the mobile station and are accepted by it, such as calls or short messages.

N

| NDC | Network destination code |

R

| realm | A fundamental element in Diameter is the realm, which is loosely referred to as domain. Realm IDs are owned by service providers and are used by |

R

Diameter nodes for message routing.

S

SBC

Single-board computer

SDM

Subscriber Data Management

SGSN

Serving GPRS Support Node

SIP

Session Initiation Protocol

SPR

Subscriber Profile Repository

A logical entity that may be a standalone database or integrated into an existing subscriber database such as a Home Subscriber Server (HSS). It includes information such as entitlements, rate plans, etc. The PCRF and SPR functionality is provided through an ecosystem of partnerships.

SRI

Send_Route_Information Message

U

UE

User Equipment

UMTS

Universal Mobile Telecommunications System

The standard for 3G used by GSM service providers. UMTS includes voice and audio services, for fast data, graphic and text transmissions, along with transmission of moving images and video.

V

V

VLR   Visitor Location Register

A component of the switching subsystem, within a GSM network. The switching subsystem includes various databases which store individual subscriber data. One of these databases is the HLR database or Home Location Register; and the VLR is another.