IMS Profile for Voice over HSPA
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1 Introduction

1.1 Overview

The IP Multimedia Subsystem (IMS) Profile for Voice and SMS, documented in this Permanent Reference Document (PRD), defines a profile that identifies a minimum mandatory set of features which are defined in 3GPP specifications that a wireless device (the User Equipment (UE)) and network are required to implement in order to guarantee an interoperable, high quality IMS-based telephony service over High-Speed Packet Access (HSPA) radio access. The scope includes the following aspects:

- IMS basic capabilities and supplementary services for telephony [Chapter 2]
- Real-time media negotiation, transport, and codecs [Chapter 3]
- HSPA radio and (evolved) packet core capabilities [Chapter 4]
- Functionality that is relevant across the protocol stack and subsystems [Chapter 5].
- Additional features that need to be implemented for the UEs and networks that wish to support concurrent Circuit Switched (CS) coverage [Chapter 6].
- Additional features that only a subset of the IMS telephony operators needs to support in certain markets [Chapter 7].

The main body of this PRD is applicable for a scenario where IMS telephony is deployed over HSPA (Packet Switched (PS)-only) in a standalone fashion or in a combination with Long Term Evolution (LTE) access with HSPA without relying on any circuit switched infrastructure. In this case the UEs and networks must be compliant with all of the normative statements in the main body.

Annex A defines the profile for an alternative approach where IMS telephony is deployed with a certain degree of reliance on an existing 3GPP circuit switched network infrastructure. Whenever there are additional requirements to the main profile, these are explicitly stated. In order to be compliant with the functionality described in Annex A, the UEs and networks must be compliant with all of the normative statements in Annex A including all of the normative statements in the main body of the PRD that are unaltered by Annex A.

1.2 Relationship to existing standards

1.2.1 3GPP Specifications

This profile is solely based on the open and published 3GPP specifications as listed in Section 1.5. 3GPP Release 8, the first release supporting LTE, is taken as a basis. It should be noted, however that not all the features specified in 3GPP Release 8 are required for compliance with this profile.

Conversely, some features required for compliance with this profile are based on functionality defined in 3GPP Release 9 or higher releases.

All such exceptions are explicitly mentioned in the following sections along with the relevant Release 8 or higher 3GPP release specifications, respectively.

Unless otherwise stated, the latest version of the referenced specifications for the relevant 3GPP release applies.

1.3 Scope

This document defines a voice over HSPA IMS profile by profiling a number of HSPA, (Evolved) Packet Core, IMS core, and UE features which are considered essential to launch interoperable IMS based voice on HSPA. This document is based on the IMS Voice and SMS profile described in PRD IR.92. The defined profile is compliant with 3GPP

specifications. The scope of this version of the profile is the interface between UE and network.

The profile does not limit anyone, by any means, to deploy other standardized features or optional features, in addition to the defined profile.

1.4 Definition of Terms

Term	Description
3GPP	3rd Generation Partnership Project
AM	Acknowledged Mode
AMR	Adaptive Multi-Rate
AMR-WB	Adaptive Multi-Rate Wideband
APN	Access Point Name
AVP	Audio Video Profile
AVPF	AVP Feedback Profile
CB	Communication Barring
CDIV	Communication Diversion
CDIVN	CDIV Notification
CFNL	Communication Forwarding on Not Logged-in
CFNRc	Communication Forwarding on Not Reachable
CN	Core Network
CS	Circuit Switched
CW	Communication Waiting
DRX	Discontinuous Reception
DTX	Discontinuous Transmission
E-DCH	Enhanced Dedicated Transport Channel
F-DPCH	Fractional Dedicated Physical Channel
GBR	Guaranteed Bit Rate
GRUU	Globally Routable User agent URI
GSM	Global System for Mobile communications
HS-DSCH	High-Speed Downlink Shared Channel
HSPA	High-Speed Packet Access
ICS	IMS Centralized Services
ICSI	IMS Communication Service Identifier
IM	IP Multimedia
IMPU	IP Multimedia Public Identity
IMS	IP Multimedia Subsystem
IMS-AKA	IMS Authentication and Key Agreement
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
ISIM	IM Services Identity Module
LTE	Long Term Evolution
MMTel	Multimedia Telephony
MO	Managed Object
MS	Mobile Station
MS-ISDN	Mobile Subscriber ISDN Number
MWI	Message Waiting Indication
NGBR	Non Guaranteed Bit Rate
PCC	Policy and Charging Control
PCRF	Policy and Charging Rules Function
P-CSCF	Proxy - Call Session Control Function
PDN	Packet Data Network
PDP	Packet Data Protocol

PS	Packet Switched
QCI	Quality of Service Class Indicator
RAT	Radio Access Technology
RLC	Radio Link Control
RoHC	Robust Header Compression
RTCP	RTP Control Protocol
RTP	Real Time Protocol
SCC AS	Service Centralization and Continuity Application Server
SDP	Session Description Protocol
SigComp	Signalling Compression
SIP	Session Initiation Protocol
SMS	Short Message Service
SMSoIP	SMS over IP
SR-VCC	Single Radio Voice Call Continuity
TAS	Telephony Application Server
TFO	Tandem-Free Operation
THP	Traffic Handling Priority
TrFO	Transcoder-Free Operation
UDP	User Datagram Protocol
UE	User Equipment
UICC	Universal Integrated Circuit Card
UM	Unacknowledged Mode
URI	Uniform Resource Identifier
UTRAN	Universal Terrestrial Radio Access Network
VoIP	Voice Over IP
XCAP	XML Configuration Access Protocol
XML	eXtensible Markup Language

1.5 Document Cross-References

Ref	Document Number	Title
1	3GPP TS 24.229	IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3
2	3GPP TS 24.305	Selective Disabling of 3GPP User Equipment Capabilities (SDoUE) Management Object (MO)
3	GSMA PRD IR.92	IMS Profile for Voice and SMS.
4	3GPP TS 25.323	Packet Data Convergence Protocol (PDCP) specification
5	RFC 3095	RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed
6	RFC 4815	RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095
7	3GPP TS 25.331	Radio Resource Control (RRC); Protocol specification
8	3GPP TS 34.108	Common test environments for User Equipment (UE); Conformance testing
9	3GPP TS 25.321	Medium Access Control (MAC) protocol specification
10	3GPP TS 25.322	Radio Link Control (RLC) protocol specification
11	3GPP TS 23.107	Quality of Service (QoS) concept and architecture
12	3GPP TS 24.008	Mobile radio interface layer 3 specification; Core Network protocols; Stage 3
13	3GPP TS 23.060	General Packet Radio Service (GPRS); Service description; Stage 2
14	3GPP TS 25.306	UE Radio Access capabilities
15	3GPP TS 23.167	IP Multimedia Subsystem (IMS) emergency sessions
16	3GPP TS 23.221	Architectural requirements

17	3GPP TS 23.237	IP Multimedia Subsystem (IMS) Service Continuity; Stage 2
18	3GPP TS 24.237	IP Multimedia Subsystem (IMS) Service Continuity; Stage 3
19	3GPP TS 23.216	Single Radio Voice Call Continuity (SRVCC); Stage 2

2 IMS feature set

2.1 General

The IMS profile part lists the mandatory capabilities, which are required over the Gm and Ut reference points.

2.2 Support of generic IMS functions

2.2.1 SIP Registration Procedures

The UE and the IMS core network must follow the Session Initiated Protocol (SIP) registration procedures defined in 3GPP TS 24.229 [1]. Selective Disabling of 3GPP User Equipment Capabilities as defined in 3GPP TS 24.305 [2] is not mandated in this profile, therefore in the case where TS 24.305 Managed Object (MO) is not deployed, it is assumed that IMS is enabled in the terminal.

Note: IR.92 [3] contains explicit statements when the UE must register with the IMS. Currently 3GPP specifications do not have similar statements regarding VoHSPA. It is for further study if explicit statements can be created for VoHSPA.

2.2.2 Authentication

The UE and the network must fulfil the requirements on IMS feature set specified as specified in section 2.2.2 of GSMA PRD IR.92 [3].

2.2.3 Addressing

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.2.3 of GSMA PRD IR.92 [3].

2.2.4 Call Establishment and Termination

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.2.4 of GSMA PRD IR.92 [3].

2.2.5 Forking

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.2.5 of GSMA PRD IR.92 [3].

2.2.6 Tracing of Signalling

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.2.6 of GSMA PRD IR.92 [3].

2.2.7 The use of Signalling Compression

UE and IMS core network must follow the Session Initiated Protocol (SIP) compression procedures defined in 3GPP TS 24.229 [1].

Note 1: 3GPP TS 24.229 expects UE to use compression.

2.3 Supplementary Services

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.3 of GSMA PRD IR.92 [3].

2.4 Call Set-up Considerations

2.4.1 SIP Precondition Considerations

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.4.1 of GSMA PRD IR.92 [3].

2.4.2 Integration of resource management and SIP

2.4.2.1 Loss of PDN connectivity

The UE and the network must fulfil the requirements as specified in section 2.4.2.1 of GSMA PRD IR.92 [3].

2.4.2.2 Void

2.4.2.3 Loss of media bearer and Radio Connection

If a Guaranteed Bit Rate (GBR) bearer used for voice fails to get established, or is lost mid-session, then the network must terminate the session associated to the voice stream according to the procedures in section 5.2.8 in TS 24.229 [1] (P-CSCF must be informed about loss of bearer by the PCRF).

Note 1: The loss of GBR bearer may be due to loss of radio connection indicated by a Iu release with relevant cause and then followed by the SGSN Initiated Dedicated Bearer/Secondary Packet Data Protocol (PDP) context Deactivation procedure for the GBR bearer used for voice. Or, the GBR bearer may be lost or not established, due to the current resource and radio situation. However, termination of the SIP session due to loss of the voice GBR bearer is the only way for the system to stop the IMS level charging (quickly) when the UE loses radio connection.

Note 2 : If other media types are used, and a GBR bearer used for another media type fails to get established, or is lost mid-session, then the network, based on its policies, has the option to either allow the session to continue as is, or terminate the SIP session that the GBR bearer is associated with. (The network can handle loss of video in a video call in such a way that the session continues as voice-only).

If a SIP session includes media streams, and if a dedicated bearer/secondary PDP context for any media stream fails to get established, or is lost mid-session, the UE must, based on its preferences, modify, reject or terminate the SIP session that the dedicated media bearer/ secondary PDP context is associated with, according to section 6.1.1 in 3GPP TS 24.229 [1]. The UE can act differently per media type.

Note 3: In the case where voice bearer is lost or fails to get established, the network will, in normal cases, release the session as described in the beginning of the section. As a complement to this, the UE must have internal logic to react to the detection of loss of bearer/radio connection to handle its internal state. In the case of multimedia communication, if the radio connection is not lost, but a bearer not used for voice is lost, then the UE must decide if the session should be maintained as is, should be modified, or should be released.

If the UE, having lost radio connectivity, then regains radio connectivity, the UE must perform a new initial registration to IMS in case the IMS registration expired during the absence of radio connectivity.

2.4.3 Voice Media Considerations

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.4.3 of GSMA PRD IR.92 [3].

2.4.4 Multimedia Considerations

The UE and the network must fulfil the requirements on IMS feature set as specified in section 2.4.4 of GSMA PRD IR.92 [3].

2.5 SMS over IP

The UE and network must fulfil the requirements on IMS feature set as specified in section 2.5 of GSMA PRD IR.92 [3].

3 IMS media

The UE and the network must fulfil the requirements on IMS feature set as specified in section 3 of GSMA PRD IR.92 [3].

4 Radio and packet core feature set

4.1 Robust Header Compression

The UE and the network must support Robust Header Compression (RoHC) as specified in 3GPP TS 25.323 (Packet Data Convergence Protocol (PDCP) [4], IETF RFC 3095 [5] and IETF RFC 4815 [6]. The UE and network must be able to apply the compression to packets that are carried over the radio bearer dedicated for the voice media. At minimum, UE and network must support "RTP/UDP/IP" profile (0x0001) to compress Real Time Protocol (RTP) packets and "UDP/IP" profile (0x0002) to compress RTP Control Protocol (RTCP) packets. The UE and network must support these profiles for both IPv4 and IPv6.

The network should always include the RoHC target mode in Radio Resource Control (RRC) messages (IE “PDCP RoHC target mode” in 3GPP TS 25.331[7]) and set it to “O-mode”.

4.2 HSPA Radio Capabilities

4.2.1 Radio Bearers

The UE and the network must support a PS Conversational Radio Access Bearer (RAB) and PS Interactive RABs that uses the transport channel parameters for the uplink according to section 6.10.2.4.6.6.1.1.1 of TS 34.108 [8] and for the downlink according to 6.10.2.4.6.6.2.1.1 of 3GPP TS 34.108 [8], using the 3GPP Release 7/8 L2 configurations with flexible Radio Link Control (RLC) for DL/UL respectively.

The Acknowledged Mode (AM) Interactive PS RAB is utilized for Universal Mobile Telecommunications System (UMTS) bearer with interactive traffic class associated with Traffic Handling Priority (THP) 1 and Signalling Indication. Unacknowledged Mode (UM) PS RAB is utilized for UMTS bearer with conversational traffic class. The above mentioned radio bearers and signalling radio bearers are mapped to High-Speed Downlink Shared Channel (HS-DSCH) and Enhanced Dedicated Channel (E-DCH) transport channels.

Evolved Packet System (EPS) bearer/PDP context usage is described in section 4.3.

4.2.2 UE Discontinuous Reception (DRX) and Discontinuous Transmission (DTX) Mode of Operation

In order to maximize lifetime of the UE battery and increase uplink capacity, UE DRX and DTX method for HSPA as specified in 3GPP TS 25.331 [7] and TS 25.321 [9] must be deployed. Support of UE DRX and UE DTX together with Rel-7 enhanced Fractional Dedicated Physical Channel (F-DPCH) is mandatory for both UE and network.

4.2.3 RLC configurations

Radio Link Control (RLC) entity must be configured to perform data transfer in the following modes as specified in TS 25.322 [10]:

- Unacknowledged Mode (UM) for UMTS bearers with conversational traffic class

- Acknowledged Mode (AM) for UMTS bearers with interactive class associated with THP 1 and Signalling Indication

Voice service can tolerate error rates on the order of one per cent (1%), while benefiting from reduced delays, and is mapped to a radio bearer running the RLC protocol in unacknowledged mode (UM).

EPS bearer/PDP context usage is described in section 4.3.

4.2.4 Conversational Traffic Class handling

Voice is one of the HSPA services that requires UMTS bearer with conversational traffic class, although it is a very low data rate compared to HSPA peak rates, as described in 3GPP TS 23.107 [11]. UMTS bearer deploying conversational class requests dedicated network resources related to the conversational traffic class for Adaptive Multi-Rate (AMR) codec values. The network resources associated with the UMTS bearer supporting conversational traffic class shall provide required GBR and transfer the voice frames within the allowed delay budget. In UL it is the UE's responsibility to comply with conversational traffic class requirements.GBR in uplink (UL) is provided by non-scheduled High Speed Uplink Packet Access (HSUPA) transmission.

4.3 Bearer Management

4.3.1 EPS Bearer/PDP Context Considerations for SIP Signalling and XCAP

The IMS application must use the IMS well known Access Point Name (APN) as defined in PRD IR.88; any other application must not use this APN.

The UE shall establish a PDN connection to the well-known IMS APN by activating a PDP context with the Interactive Traffic Class (TC) with the Traffic Handling Priority THP=1. It is used for SIP signalling. The UE shall also indicate that the request be prioritized over the radio interface by setting the Signalling Indication attribute within the Quality of Service (QoS) information element as described in 3GPP TS 24.008 [12].

To enable the transport of XCAP, the home network and the UE must support the functionalities as described in section 4.3.1 in GSMA PRD IR.92 [3].

In General Packet Radio Service (GPRS) architecture when based on Gn/Gp interfaces PDP context exists between UE, Serving GPRS Support Node (SGSN) and Gateway GPRS Support Node (GGSN).

In GPRS architecture when based on S4/S5/S8 interfaces (also called (EPC architecture) PDP context exists between UE and SGSN, and EPS bearer is used between SGSN, SGW and PGW instead of PDP context.

4.3.2 EPS Bearer/PDP Context Considerations for Voice

For an IMS session request for a Conversational Voice call (originating and terminating), a PDP context for IMS-based voice must be created utilising interaction with dynamic Policy Control & Charging (PCC). The network must initiate the creation of a PDP context to transport the voice media. The packet core shall support the Network Requested Secondary PDP Context Activation Procedure as described in 3GPP TS 23.060 [13]. The PDP context shall be created with the Conversational TC with Source Statistics Descriptor set to speech. The network must not create more than one PDP context for voice media. Therefore, the UE and network must be able to multiplex the media streams from multiple concurrent voice sessions.

Note 1: A single PDP context is used to multiplex the media streams from multiple concurrent voice sessions; this is necessary in some supplementary services (for example CW, CONF).

Note 2: The sharing of a single PDP context for voice means that different traffic classes and/or ARP values are not possible for different voice streams.

For IMS session termination of a Conversational Voice call, the PDP context must be deleted utilising interaction with dynamic PCC. The network must initiate the deletion of the PDP context.

In GPRS architecture when based on Gn/Gp interfaces PDP context exists between UE, SGSN and GGSN.

In GPRS architecture when based on S4/S5/S8 interfaces (also called (EPC architecture) PDP context exists between UE and SGSN, and EPS bearer is used between SGSN, SGW and PGW instead of PDP context.

4.4 P-CSCF Discovery

The UE and the packet core must support the procedures for P-CSCF discovery via GSM EDGE Radio Access Network / UMTS Terrestrial Radio Access Network (GERAN/UTRAN) access. This is described in 3GPP TS 24.229 Annex B.2.2.2 as option II for P-CSCF discovery [1].

4.5 Mobility to and from LTE

If the UE supports both HSPA and evolved UMTS Terrestrial Radio Access (E-UTRA), and both HSPA and E-UTRA support IMS voice, the UE and the network shall support the Inter-RAT PS handover to and from E-UTRA feature as described in 25.331 [7] and 25.306 [14]. Depending on the duplexing division supported by the UE (E-UTRA Frequency Division Duplex (FDD), E-UTRA Time Division Duplex (TDD) or both) the UE must set to TRUE the respective capability IEs (“Support for Inter-RAT PS Handover to E-UTRA FDD” or “Support for Inter-RAT PS Handover to E-UTRA TDD”).

Furthermore, the UE and network shall support the EUTRAN measurement and reporting in connected mode as described in Annex E of 25.331 [7].

5 Common functionalities

5.1 IP Version

The UE and the network shall support both IPv4 and IPv6 for all protocols that are used for VoIP: SIP, SDP, RTP, RTCP and XCAP/HTTP. A UE that supports both versions of the protocol shall set the requested PDP Type to IPv4v6 as described in Release 9 of 3GPP TS 23.060 [13]. If both IPv4 and IPv6 addresses are assigned for the UE, the UE must prefer to IPv6 address type when the UE discovers the P-CSCF.

After the UE has discovered the P-CSCF and registered to IMS with a particular IP address (IPv4 or IPv6), the UE must use that same address for all SIP, SDP and RTP/RTCP communication, as long as the IMS registration is valid.

Note: There are certain situations where interworking between IP versions is required. These include, for instance, roaming and interconnect between networks using different IP versions. In those cases, the network needs to provide the interworking in a transparent manner to the UE.

5.2 Emergency Service

UEs and network deployments must support emergency services in the IMS domain.

The UE and the network must support the Release 9 IMS emergency services as specified in TS 24.229 [1], TS 23.167, chapter 6 and Annex H [15], and Release 9 emergency procedures as specified in TS 23.060 [13].

Recognizing that some network operators will continue a parallel CS network whilst their IMS network is deployed, and that support of Emergency calls with CS support may be a local regulatory requirement, Emergency calls in the CS domain are addressed in Annex A.

UEs and networks compliant with this profile must implement support for the 3GPP IM CN subsystem XML body as defined in section 7.6 of 3GPP TS 24.229 [1].

Note 1: This body is used to re-direct emergency calls to the CS domain.

The usage of the 3GPP IM CN subsystem XML body in the network is an operator option.

Note 2: This implies that the P-CSCF must support also the option that the XML body is not used.

5.3 Roaming Considerations

The UE and the network must fulfil the requirements on IMS feature set as specified in section 5.3 of GSMA PRD IR.92 [3].

Annex A: Complementing IMS with CS

A.1 General

To offer customers a seamless service, an operator may wish to complement the IMS VoIP capable radio coverage by utilising the CS radio access for voice and SMS. The IMS VoIP coverage may be less or more extensive than the concurrent Circuit Switched (CS) coverage. This Annex describes the additional features that need to be implemented for the UEs and networks that wish to support such a deployment scenario.

The voice related requirements in this annex are applicable if the UE has the setting of “IMS PS Voice preferred, CS Voice as secondary”.

A.2 Domain Selection

The UE and the network must support the IMS voice over PS supported indication as specified in TS 24.008 [12] and TS 23.060 (section 5.3.8) in 3GPP Release 8 [13].

A UE must perform voice domain selection for originating sessions with the setting of “IMS PS Voice preferred, CS Voice as secondary” as specified in TS 23.221, Section 7.2a (UTRAN applicable sections) [16].

A UE must reject the incoming request if the UE is unable to support speech media on current PS access as specified in 3GPP TS 23.237 [17] and 3GPP TS 24.237 [18].

A.3 SR-VCC

The network must support the Single Radio Voice Call Continuity (SR-VCC) procedures for handover from HSPA to UTRAN / GERAN as described in TS 23.216 [19] and TS 23.237 [17]. The UE detects that the network support SR-VCC from the reply from the SGSN on the Attach request message (TS 23.216 section 6.3.1) [19].

The UE must support the SR-VCC procedures from HSPA to UTRAN/GERAN for single active call only as described in TS 23.216 [19], TS 24.008 [12], TS 24.237 [18] section 9.2.1, and TS 23.060 [13].

Note 1: The mechanisms to perform transfer of additional session / held state / conference call state / alerting calls are out of scope of the present version of this profile.

Note 2: UEs using IMS Centralized Services (ICS) capabilities are out of scope of the present version of this profile.

A.4 IMS Voice service settings management when using CS access

The UE must use service setting management as defined in section 2.3.2 of GSMA PRD IR.92 [3].

Note: This applies also when UE is using CS network for voice service

A.5 Emergency Service

This section modifies the requirements defined in section 5.2 in the following ways:

The UE must and the network can support the procedures and capabilities defined in section 5.2.

If the support of one or more of the following scenarios is required, then the network must support the procedures in section 5.2:

- Deployment scenarios where the IMS VoIP capable radio coverage is not complemented by CS radio coverage.
- Provide voice service on HSPA to UE with incompatible CS domain.

- Provide voice service on HSPA to UE supporting HSPA only.

When emergency service support via CS domain is required, the UE and network must support the CS emergency service as used today.

The UE must be able to perform domain selection for emergency calls, and automatically be able to retry in the other domain if an emergency session attempt fails, as defined in TS 23.167 chapter 7.3 [15] and TS 24.229 [1]. The UE must be able to detect if the network is not supporting IMS emergency sessions as defined in TS 23.060 [13], then select the CS domain for UE detected emergency sessions.

The network must be able to reject an IMS emergency session attempt such that the UE can retry in the CS domain, as defined in 3GPP TS 24.229 [1] and 3GPP TS 23.167, chapter 6.2.1 [15].

The UE must support SR-VCC for IMS emergency sessions from HSPA to UTRAN/GERAN as specified in 3GPP Release 9 TS 23.216 [19] and TS 23.237 [17]. The SR-VCC UE which supports IMS emergency service must support SIP instance ID as per the procedures in 3GPP TS 24.237 section 7.2 [18].

If the network supports the procedures and capabilities defined in section 5.2, then the network must support SR-VCC for IMS emergency sessions from HSPA to UTRAN/GERAN as specified in 3GPP Release 9 TS 23.216 [19] and TS 23.237 [17]. The network must support the SIP instance ID as described in 3GPP TS 24.237 [18].

UE that is CS voice capable and in limited service state should behave as described in Annex A.5 in GSMA PRD IR.92 [3].

A.6 Roaming Considerations

The UE and the network must fulfil the requirements on IMS feature set as specified in section A.6 of GSMA PRD IR.92 [3].

A.7 SMS Support

This section modifies the requirements defined in section 2.5 in the following ways:

The UE and network must fulfil the requirements as specified in Annex A.7 of GSMA PRD IR.92 [3], where "SMS over SGs" is interpreted as "SMS over NAS signalling" and where 3GPP TS 24.301 is replaced with 3GPP TS 24.008 [12].

Note: Sending of SMS over IP is enabled or disabled in the UE regardless of the access technology used. Therefore, if sending SMS over IP is disabled in a UE supporting SMS in multiple access technologies, then the UE will never send SMS over IP – that is when the UE is attached to UTRAN/GERAN, the UE will send SMS using NAS signalling, and when the UE is attached to E-UTRAN, the UE will send SMS using SMS over SGs.

Annex B: Features Needed In Certain Markets

B.1 General

This annex describes features that only a subset of the IMS telephony operators needs to support in certain markets. These features typically are operationally required due to national regulatory requirements.

B.2 Global Text Telephony

The UE and the network must fulfil the requirements on IMS feature set specified in Annex B.2 of GSMA PRD IR.92 [3].

Document Management

Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
0.1	27.6.2011	New PRD (RILTE Doc 18_011).	RILTE #18	Miikka Poikselkä/NSN
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