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Technical Specification

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document defines the principal purpose and use of International Mobile station Equipment Identities (IMEI).

3GPP TS 23.003 describes the technical manner of numbering, addressing and identification.

1.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.003: "Numbering, addressing and identification".

[3] ISO/IEC 7812 (1989): "Identification cards - Numbering system and registration procedure for issuer identifiers".

1.2 Definitions and abbreviations

In addition to the following, abbreviations used in the present document are listed in 3GPP TS 21.905.

International Mobile Station Equipment Identity (IMEI) : An "International Mobile Station Equipment Identity" is a unique number which shall be allocated to each individual mobile station equipment in the PLMN and shall be unconditionally implemented by the MS manufacturer.

2 General

An MS can only be operated if a valid "International Mobile Subscriber Identity" (IMSI) is present. An IMSI is primarily intended for obtaining information on the use of the PLMN by subscribers for individual charging purposes.

Besides the IMSI, the implementation of IMEI is found necessary in order to obtain knowledge about the presence of specific mobile station equipment in the network, disregarding whatever subscribers are making use of these equipments.

The main objective is to be able to take measures against the use of stolen equipment or against equipment of which the use in the PLMN can not or no longer be tolerated for technical reasons.

The IMEI is incorporated in an UE module which is contained within the UE. The IMEI shall be unique and shall not be changed after the ME's final production process. It shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software).

NOTE: This requirement is valid for new GSM MEs type approved after 1st June 2002. However, this requirement is applicable to all 3GPP system compatible UEs from start of production.

The manufacturer implementing the IMEI module in the ME is responsible for ensuring that each IMEI within the allocatd range is unique to the ME in which it resides, and is also responsible for keeping detailed records of produced and delivered MEs.

3 Composition of IMEI

The composition of the IMEI shall be such that each individual mobile station equipment can be separately identified.

Information is contained in the IMEI by which the PLMN, after requesting it, can immediately decide whether or not to accept calls made by means of this equipment.

Secondly, the IMEI shall directly or indirectly contain all information which is necessary for the network operator to make relations through its administrative system to trace the equipment to its origin of production. 3GPP TS 23.003 [2] describes the structure of the IMEI in detail.

The IMEI is complemented by a check digit. The check digit is not part of the digits transmitted at IMEI check occasions, as described below. The Check Digit shall avoid manual transmission errors, e.g. when customers register stolen MEs at the operators customer care desk.

NOTE: The Check Digit is not applied to the Software Version Number.

4 Use of the equipment identity register

A network operator can make administrative use of the IMEI in the following manner:

Three registers are defined, known as "white lists", "grey lists" and "black lists". The use of such lists is at the operators' discretion.

The **white list** is composed of all **number series** of equipment identities that are permitted for use.

The **black list** contains all equipment identities that belong to equipment that need to be barred.

Besides the black and white list, administrations have the possibility to use a **grey list**. Equipments on the grey list are not barred (unless on the black list or not on the white list), but are tracked by the network (for evaluation or other purposes).

5 Procedure

It shall be possible to perform the IMEI check at any access attempt, except IMSI detach, and during an established call at any time when a dedicated radio resource is available, in accordance with the security policy of the PLMN operator. It shall also be possible to perform the IMEI check when a UE is IMS registered.

The network shall terminate any access attempt or ongoing call when receiving any of the answers "black-listed" (i.e., on the black list) or "unknown" equipment (i.e., not on the white list) from the EIR. An indication of "illegal ME" shall in these cases be given to the user. Furthermore this is equivalent to an authentication failure hence any call or IMS session establishment or any location updating is forbidden for the MS, it cannot answer to paging, it is just allowed to perform Emergency Calls. Emergency calls must never be terminated as a result of the IMEI check procedure.

6 Use of IMEI in case of emergency calls

Emergency calls can in some PLMNs be made without having to send the subscriber identity (IMSI) to the network. In this case the misuse of MS equipments after placing invalid emergency calls can be restrained by using the equipment identity.

The network request for the equipment identity is sent to the MS after the emergency call has been set-up. The procedure is the same as for normal call set-up.

7 MS Software Version Number (SVN)

A Software Version Number (SVN) field shall be provided. This allows the ME manufacturer to identify different software versions of a given mobile.

The SVN is a separate field from the IMEI, although it is associated with the IMEI. When the network requests the IMEI from the MS, it may also request that the SVN is also sent towards the network.

The white list shall use the IMEI, The Black and Grey Lists may also use the SVN.

Annex A (informative): Change history

Change history											
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**WI**
Jun 1999			GSM 02.16					Transferred to 3GPP SA1	7.0.0		
SA#04			22.016					Transferred to 3GPP SA1		3.0.0	
SP-05	SP-99479	S1-99611	22.016	001		R99	D	Editorial changes for alignment	3.0.0	3.0.1	Editorial changes
SP-06	SP-99601	P-99-777	22.016	002		R99	F	Modification of section 2 to enhance IMEI security	3.0.1	3.1.0	
SP-08	SP-000195	S1-000441	22.016	003	1	R99	F	IMEI coding	3.1.0	3.2.0	
SP-08	SP-000194	S1-000266	22.016	004		R99	F	Modification of section 2 to delete unnecessary information about phases and releases removed	3.1.0	3.2.0	
SP-11	SP-010065	S1-010258	22.016			Rel-4		Transferred to 3GPP Release 4	3.2.0	4.0.0	
SP-15	SP-020045	S1-020457	22.016	006	-	Rel-4	F	Editorial CR to correct terms and references	4.0.0	4.1.0	CORREC T
SP-16	SP-020237	S1-021149	22.016	008		Rel-4	A	Type approval code	4.0.0	4.1.0	TEI
SP-16	SP-020267	S1-021043	22.016			Rel-5		Updated from Rel-4 to Rel5	4.1.0	5.0.0	
SP-26	SP-040744	S1-040997	22.016			Rel-6		Updated from Rel-5 to Rel-6	5.0.0	6.0.0	
SP-34	SP-060768	S1-061444	22.016	0009	-	Rel-7	F	IMEI Check and IMS	6.0.0	7.0.0	TEI7
			22.016			Rel-7		Editorial correction to version identity on front cover	7.0.0	7.0.1	
SP-42	SP-080891	S1-083445	22.016	0010	1	Rel-7	F	Correction of SVN sending when network requests IMEI	7.0.1	7.1.0	TEI7
								Rel-8 version created	7.1.0	8.0.0	
SP-45	SP-090470	S1-093278	22.016	0013	2	Rel-9	A	Clarify that each IMEI shall be unique	8.0.0	9.0.0	TEI9
								2010-04: correct history table	9.0.0	9.0.1	
2011-03	-	-	-	-	-	-	-	Update to Rel-10 version (MCC)	9.0.1	10.0.0	
2012-09								Update to Rel-11 version (MCC)	10.0.0	11.0.0	
2014-10	-	-	-	-	-	-	-	Update to Rel-12 version (MCC)	11.0.0	12.0.0	
2015-12								Update to Rel-13 version (MCC)	12.0.0	13.0.0	
2017-03	-	-	-	-	-	-	-	Updated to Rel-14 by MCC	13.0.0	14.0.0	
2018-06	-	-	-	-	-	-	-	Updated to Rel-15 by MCC	14.0.0	15.0.0	
2020-07	-	-	-	-	-	-	-	Updated to Rel-16 by MCC	15.0.0	16.0.0	