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European digital cellular telecommunications system (Phase 2);
Signalling requirements on interworking between the
Integrated Services Digital Network (ISDN) or
Public Switched Telephone Network (PSTN) and the
Public Land Mobile Network (PLMN)
(GSM 09.03)

ETSI

European Telecommunications Standards Institute

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New presentation - see History box

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN) within the European digital cellular telecommunications system (Phase 2).

This ETS correspond to GSM technical specification, GSM 09.03 version 4.0.3.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM Technical Specifications (GSM-TS) (NOTE).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TS). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSs.

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1 Scope

The purpose of this technical specification is to present the general requirements for the Public Switched Telephone Network (PSTN) and the Integrated Services Digital Network (ISDN) as well as for the mobile network to be met in order to ensure a correct integration of the mobile service in the fixed network.

This technical specification covers only the signalling aspects of the interworking. The service requirements have to be covered in a specific specification: only the signalling impacts have to be dealt with here.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1]   GSM 01.04 (ETR 100): "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".

[2]   GSM 03.01 (ETS 300 521): "European digital cellular telecommunications system (Phase 2); Network functions".

[3]   CCITT Recommendation Q.701: "Functional description of the message transfer part (MTP) of Signalling System No.7".

[4]   CCITT Recommendation Q.702: "Specifications of Signalling System No. 7 - Signalling data link".

[5]   CCITT Recommendation Q.703: "Signalling link".

[6]   CCITT Recommendation Q.704: "Signalling network functions and messages".

[7]   CCITT Recommendation Q.705: "Signalling network structure".

[8]   CCITT Recommendation Q.706: "Message transfer part signalling performance".

[9]   CCITT Recommendation Q.707: "Specifications of Signalling System No. 7 - Testing and maintenance".

[10]   CCITT Recommendation Q.711: "Functional description of the signalling connection control part".

[11]   CCITT Recommendation Q.712: "Definition and function of SCCP messages".

[12]   CCITT Recommendation Q.713: "SCCP formats and codes".

[13]   CCITT Recommendation Q.714: "Signalling connection control part procedures".

[14]   CCITT Recommendation Q.771: "Specifications of Signalling System No.7; Functional description of transaction capabilities".

[15]   CCITT Recommendation Q.772 (1988): "Specifications of Signalling System No.7; Transaction capabilities information element definitions".

[16]   CCITT Recommendation Q.773 (1988): "Specifications of Signalling System No.7; Transaction capabilities formats and encoding".

[17]   CCITT Recommendation Q.774 (1988): "Specifications of Signalling System No.7; Transaction capabilities procedures".

[18]   ETS 300 303: "Integrated Services Digital Network (ISDN); ISDN - Global System for Mobile communications (GSM) Public Land Mobile Network (PLMN) signalling interface".

3   Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

4   General signalling requirements

4.1   Requirements for the mobile network

In order to be integrated in the fixed network the PLMN must comply with the following requirements:

a)   The Mobile Application Part (MAP) which supports information exchanges between the nodes of the mobile service uses the facilities of Transactions Capabilities (TC) of Signalling System No. 7 (SS7). Therefore the equipments of the mobile network must comply with the specifications of the interface between TC and the application user. If TC functions are integrated in the mobile network equipments, the latter must comply with the relevant specifications (CCITT Recommendations Q.771 to Q.774).

b)   For MAP messages routing purpose, the mobile nodes must provide the Signalling Connection Control Part (SCCP) via TC with an address complying with the relevant specifications (CCITT Recommendations Q.711 to Q.714).

c)   For call set-up, the Mobile-services Switching Centres (MSCs) must interface with the fixed exchanges. In the detailed interworking specifications, the fixed network signalling considered are the SS7 and its User Parts (Telephone User Part (TUP) or Integrated Services Digital Network User Part (ISUP)). The MSCs must comply with the same signalling interface specifications as the fixed exchanges.

d)   The Public Land Mobile Network (PLMN) and the signalling on the radio path must provide the information needed to ensure a correct interworking with the fixed network. The interworking in the MSCs must occur with a minimum loss of information.

e)   The PLMN nodes must interface with the SS7 signalling network. For that, they must comply with the Message Transfer Part (MTP) specifications (CCITT Recommendations Q.701 to Q.707).

f)   The signalling interface between ISDN and PLMN is described in ETS 300 303.

5 Impact of the off-air call set-up (OACSU) on the interworking

The use of OACSU in the PLMN has an impact on the interworking with the fixed network. Both outgoing and incoming calls have to be considered: the consequences are not the same.

The use of the OACSU procedure is optional and must be limited to national telephone calls only (see GSM 03.01).

5.1 Definition of OACSU

To save the radio resources, the radio traffic channel may be allocated to the communication only when both calling and called parties are present, ie. at the answer instant. This method called "Off-Air Call Set-Up" (OACSU) has some implication on the interworking with the fixed network. But the consequences are not the same whether the mobile subscriber is the calling or the called party.

5.2 Outgoing call from a mobile station

Upon initiation of an outgoing call, a traffic channel is allocated to the communication when the called subscribers answer is received in the MSC. In some cases, no idle traffic channel may be available when necessary. Therefore an appropriate announcement must be given to the called party when no idle traffic channel is available within a certain interval upon receipt of the called party's answer.

Whenever the announcement is used, it must always be played through in its entirety, even if a traffic channel becomes available before it is completed, except if the called party clears, in which case the call should be cleared forward.

If the ADDRESS COMPLETE message (ACM) indicates that there will possibly be no ANSWER message upon the connection of the called party (e.g. ACM without any information), the radio path must be established immediately upon receipt of the ACM. This applies in all cases on receipt of the ADDRESS COMPLETE message in TUP and ISUP (e.g. also in case the value "subscriber free" is received.

Due to interworking constraints coming from the characteristics of the different signalling systems used in the countries, the OACSU technique should only be used for national calls.

5.3 Incoming call to a mobile station

For incoming calls, the impact is not so important, but some rules must be applied in order to limit the influence on the service quality.

Concerning the sending instant of the answer message, the normal operating rules apply. If the call is successfully set-up to the mobile station, the answer message must be sent to the originating exchange only when the traffic channel is established upon recognition of the called party connection.

History

Document history	
February 1995	First Edition
November 1995	Converted into Adobe Acrobat Portable Document Format (PDF)