



# SLOVENSKI STANDARD SIST ETS 300 524 E1:2003

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European digital cellular telecommunications system (Phase 2); Signalling requirements relating to routing of calls to mobile subscribers (GSM 03.04)

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**ICS:**

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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**(GSM 03.04)**

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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 defines the Signalling requirements relating to routing of calls to mobile subscribers within the European digital cellular telecommunications system (Phase 2). This ETS corresponds to GSM Technical Specification (GSM-TS) GSM 03.04 version 4.0.4

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-TSs (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-TSs). These TSs may have subsequently become I-ETTs (Phase 1), or ETSS (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in GSM ETSS.

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## 1 Scope

When a subscriber wants to call a mobile station (MS), the network needs to know the location of the called MS in order to route the call to the appropriate Mobile Services Switching Centre (MSC) - see Technical Specification GSM 03.12 on location registration. This document describes how the routing process can be performed, and considers the effect on the routing process of the capabilities of the exchanges involved.

This document assumes that the Mobile Station ISDN Number includes a specific National Destination Code which identifies the Home PLMN (HPLMN) of the called MS (referred to below as 'the HPLMN'). If the numbering plan for MSs is fully integrated into the fixed network numbering plan, the method of routing may be different.

In the diagrams in section 6, the originating local exchange is shown as being part of an ISDN. The same routing principles apply if the originating local exchange is part of a PSTN.

Short Messages are routed in the same way as circuit-switched calls; the SMS Gateway MSC must be able to interrogate the HLR of the MS for which the short message is intended, in order to route the short message to the visited MSC.

## 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 telecommunication system (Phase 2); Abbreviations and acronyms".
- [2] GSM 03.07 (prETS 300 525): "European digital cellular telecommunication system (Phase 2); Restoration procedures".
- [3] GSM 03.12 (prETS 300 530): "European digital cellular telecommunication system (Phase 2); Location registration procedures".
- [4] GSM 09.02 (prETS 300 599): "European digital cellular telecommunication system (Phase 2); Mobile Application Part (MAP) specification".

## 3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

## 4 General routing rules

The number dialled by the calling subscriber contains no indication of the location of the called MS. In order to route the call to the MS the network must be aware of the location of the MS and the routing address to be used. The routing address is the Mobile Station Roaming Number (MSRN); the only network entity which can provide the MSRN is the Home Location Register (HLR) of the HPLMN, hence in order to route the call to the visited MSC (VMSC) where the called MS is located it is necessary to interrogate the HLR.

The preferred arrangement for interrogation of the HLR is to direct the call to a Gateway MSC (GMSC) which is part of the HPLMN. This simplifies the process of charging the called subscriber correctly if the call has to be re-routed because the called MS has roamed to a different PLMN or if the call has to be forwarded.

The consequence of this is that the preferred signalling procedure is as follows:

- i) When a subscriber wants to call an MS he dials the MSISDN of the called MS.
- ii) The originating local exchange (LE), or a transit exchange, analyses the dialled number and recognises the NDC which identifies the HPLMN. If the calling subscriber is in a different country from the called MS, this analysis will in general not be performed by the originating LE; when the international prefix is recognised, the call is routed to an outgoing International Switching Centre (ISC) without any further analysis, and the incoming ISC in the destination country recognises the NDC of the HPLMN.
- iii) The call is directed to a GMSC in the HPLMN. The GMSC interrogates the HLR, which returns the MSRN for the called MS. The HLR obtains the MSRN by interrogating the VLR where the called MS is currently registered. This procedure uses the Mobile Application Part of Signalling System CCITT No 7 - see Technical Specification GSM 09.02.
- iv) The GMSC uses the MSRN to route the call to the VMSC.

Section 5 describes the routing of a call from a subscriber served by the HPLMN.

Section 6 describes the routing of a call from a subscriber in the same country as the HPLMN, but not served by the HPLMN.

Section 7 describes the routing of a call from a subscriber in a different country from the HPLMN.

## 5 Routing of a call from a subscriber served by the HPLMN

If the calling subscriber is served by an exchange which is part of the HPLMN, the configuration is as shown in figure 1. The originating MSC is able to interrogate the HLR for an MSRN, and the call is routed within the PLMN. If the called MS has roamed to another PLMN the originating MSC routes the call to the visited PLMN (VPLMN) as shown in figure 2.

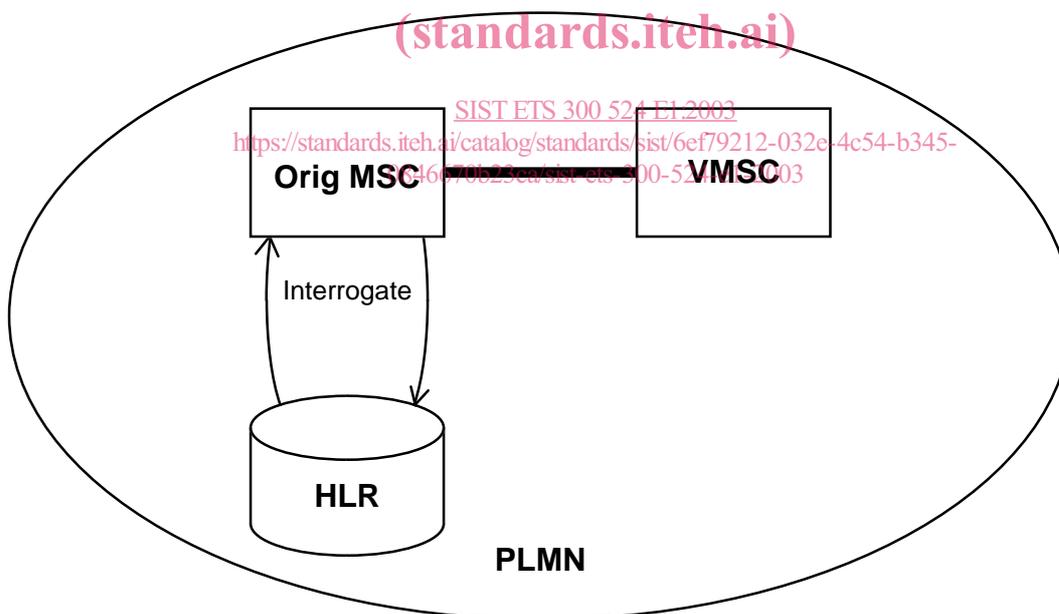


Figure 1: Call from a subscriber in the HPLMN of the called MS

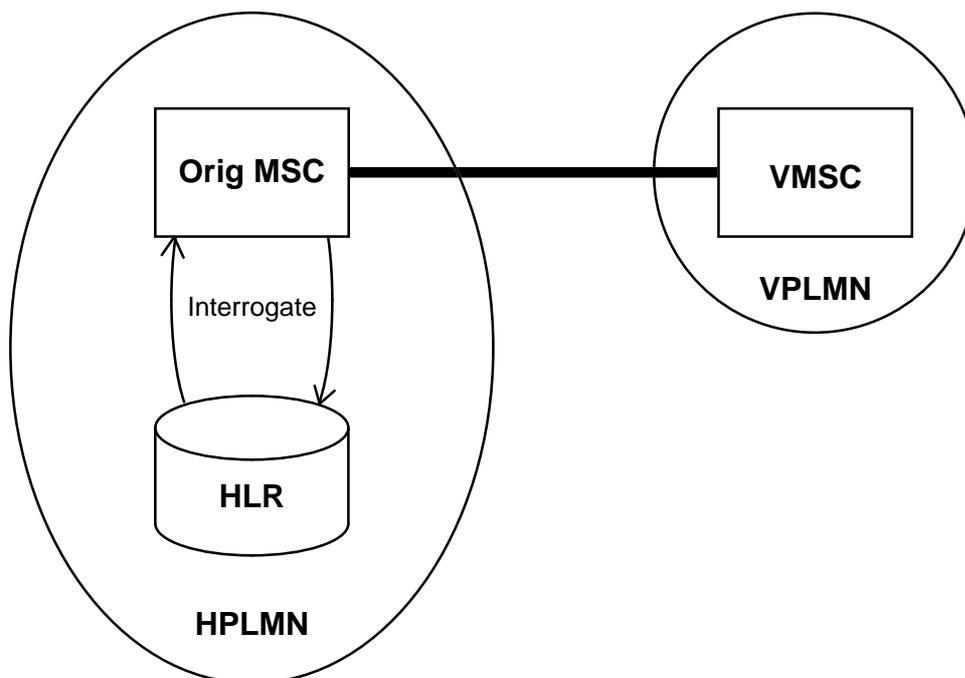


Figure 2: Call from a subscriber in the HPLMN of the called MS; called MS roamed to another PLMN

## 6 Routing of a call from a subscriber in the same country as the HPLMN but not served by the HPLMN

This section considers two configurations: where the HLR is interrogated by a gateway exchange which is part of the HPLMN (the preferred configuration), and where the HLR is interrogated by the originating LE.

### 6.1 Interrogation by a Gateway MSC

If the HLR is interrogated by a gateway exchange which is part of the HPLMN, the configuration is as shown in figure 3. The call is handled as described in section 4. If the called MS has roamed outside its HPLMN the GMSC routes the call to the visited PLMN (VPLMN) as shown in figure 4.