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Universal Short Message Service (uSMS) - IN architecture and functionality

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

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1 Scope

The present document gives guidance on the network architecture and functionality to support a Point-Point Short Message Service (PP-SMS) feature to users access network services via PSTN, ISDN, PLMN and IP as it is defined in DES/SPAN-110093 (see Bibliography).

2 References

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

- 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] GSM 09.02: "European digital telecommunications system; Mobile Application Part (MAP) specification".
- [2] GSM 03.40: "Technical realization of the Short Message Service (SMS) Point-to-Point (PP)".
- [3] CCITT Recommendation E.213: "Telephone and ISDN numbering plan for land mobile stations in public land mobile networks (PLMN)".
- [4] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in GSM 09.02 [1] apply.

msIsdn: this parameter refers to one of the ISDN numbers assigned to a mobile subscriber in accordance with CCITT Recommendation E.213 [3]

sm-RP-PRI: this parameter is used to indicate whether or not delivery of the short message shall be attempted when a service centre address is already contained in the Message Waiting Data file

ServiceCentreAddress: this parameter represents the address of a Short Message Service Centre

Sm-RP-UI: this parameter represents the user data field carried by the short message service relay sub-layer protocol

MoreMessagesToSend: this parameter is used to indicate whether or not the service centre has more short messages to send

MwStatus: this parameter indicates whether or not the address of the originator service centre is already contained in the Message Waiting Data file. In addition, it contains the status of the Memory Capacity Exceeded Flag (MCEF) and the status of the Mobile subscriber Not Reachable Flag (MNRF)

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CLI	Calling Line Identity
CUSF	Call Unrelated Service Function
FT	Fixed Terminal
GSM	Global System for Mobile communication
HLR	Home Location Register
INAP	Intelligent Network Application Protocol
IWF	InterWorking Function
IWU	InterWorking Unit
MAP	Mobile Application Protocol
MCEF	Mobile Station Memory Capacity Exceeded Flag
MNRF	Mobile Not Reachable Flag
MWD	Message Waiting Data
PT	Portable Terminal
SC	Service Control
SCF	Service Control Function
SCFh	SCF home (network)
SCFv	SCF visited (network)
SCUAF	Service Call Unrelated Agent Function
SDF	Service Data Function
SMS	Short Message Service
SMSC	Short Message Service Centre
VLR	Visited Location Register

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4 uSMS service requirements

The uSMS service requirements are specified in DES/SPAN-110093 (see Bibliography).

In line with the HLR in GSM networks, the supporting network shall have some predefined data fields for uSMS parameters. For example,

The HLR contains (optional):

- Message Waiting Data (MWD):
 - MSIsdn-Alert;
 - SC address 1;
 - SC address 2;
 - ...;
 - SC address n;
- Mobile Not Reachable Flag (MNRF);
- Mobile Station Memory Capacity Exceeded Flag (MCEF).

The VLR contains (optional):

- Mobile Not Reachable Flag (MNRF).

The case where MWD, MNRF and MCEF are not implemented in the HLR is also described in GSM 03.40 [2].

5 uSMS Functional Architecture

5.1 ISDN/IN Infrastructure

This section describes the architecture for uSMS based on an ISDN/IN supporting infrastructure. It covers these cases where the user is in his/her home network or in a visited network. The implementation of uSMS should deliver the SMS with the same (or higher) QoS as for the GSM SMS.

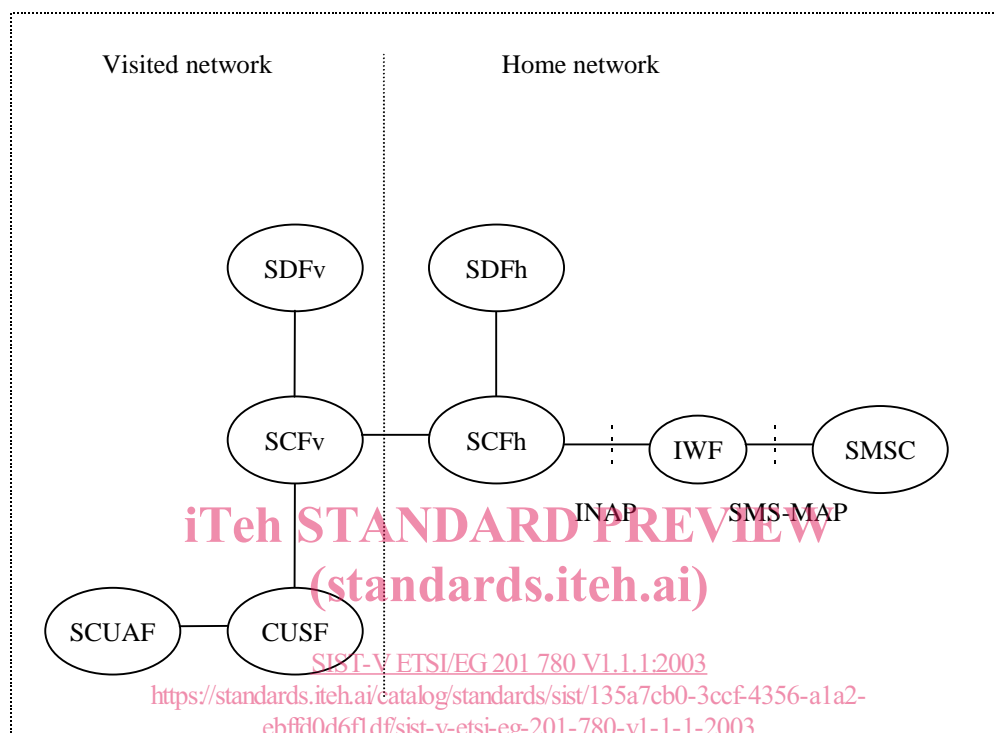


Figure 1: Architecture for uSMS in ISDN/IN

5.2 Packet Service Infrastructure

This is for further study.

6 Point-Point uSMS Procedures and Information Flows

This section displays for each procedure information flows; the mapping of these flows to specific protocol messages is outside the scope of the present document.

The following procedures are relevant for the uSMS service:

- Short Message terminal originated (normal and exception procedure);
- Short Message terminal terminated (normal and exception procedure);
- Short Message delivery notification.

NOTE: In the present document the SMS is defined following the GSM procedures (i. e. it is assumed that the terminals are able to store SMS messages).

6.1 Terminal originated uSMS normal transfer procedure

In the terminal originated case, a short message is sent from the terminal (portable or fixed) towards the short message service centre. This short message is sent along with the E.164 [4] number of the recipient, and possibly the Calling Line Identity of the originating terminal (CLI) in case the recipient should receive this information as in the GSM SMS service. The CLI may be replaced by the calling user number e.g. in the case of virtual calling card, UPT.

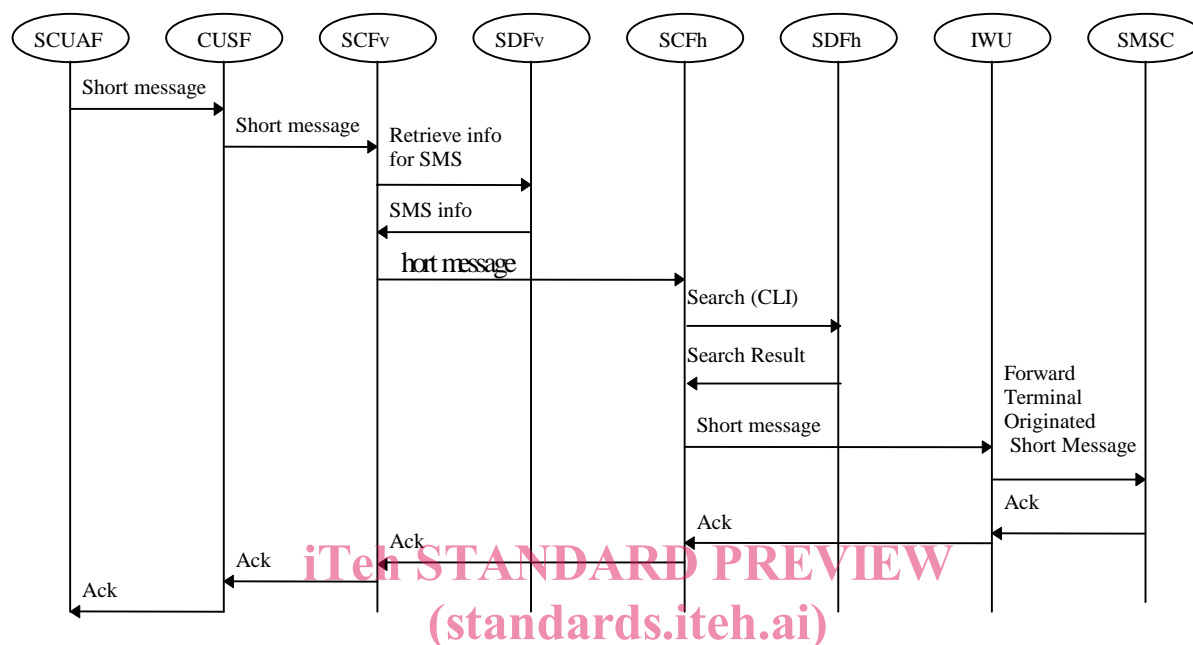


Figure 2: Terminal originated short message transfer

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Information flow	Interface	Parameters needed
Short message	SCUAF-CUSF	<ul style="list-style-type: none"> Called Party E.164 [4] Calling Party E.164 [4] (CLI) ServiceCentreAddress sm-RP-UI
Short message	CUSF-SCFv	<ul style="list-style-type: none"> Called Party E.164 [4] Calling Party E.164 [4] (CLI) ServiceCentreAddress sm-RP-UI
Retrieve info for SMS	SCFv-SDFv	<ul style="list-style-type: none"> CLI
SMS info	SDFv-SCFv	<ul style="list-style-type: none"> SCFh id (Note 2)
Short message	SCFv-SCFh	<ul style="list-style-type: none"> Called Party E.164 [4] Calling Party E.164 [4] (CLI) ServiceCentreAddress sm-RP-UI
Search	SCFh-SDFh	<ul style="list-style-type: none"> CLI (Note 1)
Search Result	SDFh-SCFh	<ul style="list-style-type: none"> Ack (ServiceCentreAddress)
Short message	SCFh-IWU	<ul style="list-style-type: none"> Called Party E.164 [4] Calling Party E.164 [4] (CLI) ServiceCentreAddress sm-RP-UI
ForwardMOShortMessage	IWU-SMSC	<ul style="list-style-type: none"> Called Party E.164 [4] Calling Party E.164 [4] (CLI) ServiceCentreAddress (optional) sm-RP-UI

NOTE 1: In order to retrieve and check the SMS access rights of the user, when the user originates a uSMS procedure, the SCFh queries the SDFh.

NOTE 2: Another possibility could be to use serviceCentreAddress, and forward the short message directly to the IWU, and bypass the SCFsl.

6.2 Terminal terminated uSMS normal transfer procedure

In the terminal terminated case, a short message is sent from the short message service centre towards the user. Also the ServiceCentreAddress is included in the transfer. The moreMessagesToSend information element allows for concatenation of SMS messages.

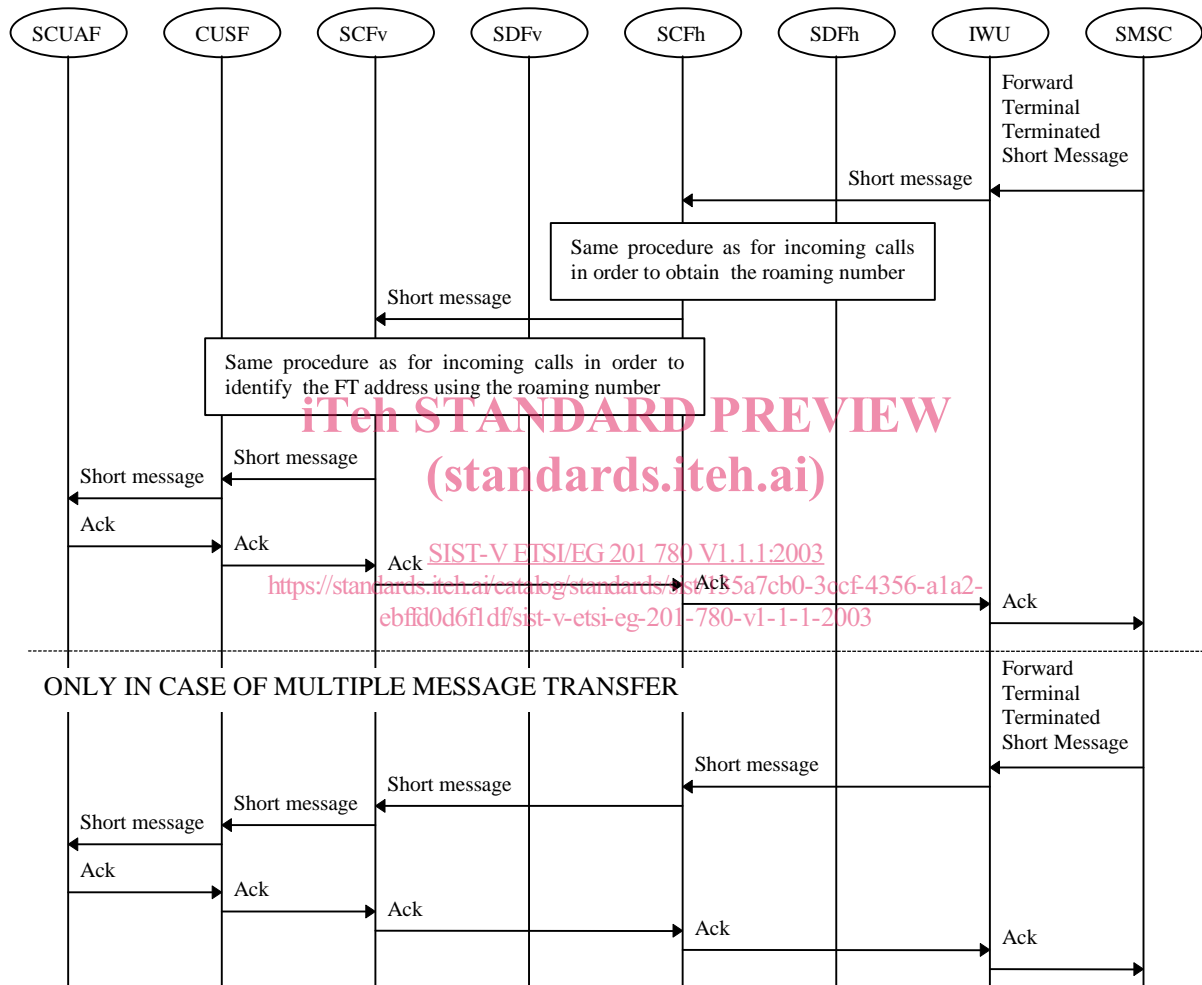


Figure 3: Terminal terminated uSMS procedure - single and multiple short message transfer