3GPP TSG CN Plenary Meeting #19 **NP-030120**
12th - 14th March 2003. Birmingham, U.K.

Source: **SA2**

Title: **Re. LS on SS barring for SMS transfer over GPRS**

Agenda item: **5.2**

Document for: **INFORMATION**

3GPP TSG-SA2 Meeting #30 *Tdoc S2-030959*
Milan, Italy, 24-28 February, 2003

Response to: S2-030033 = NP-020672, S2-030405 = S1-030241
Release: Rel-6
Work Item: TEI6

To: CN, SA1
Cc: CN1, CN4

Contact Person:
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E-mail Address: igarashi@nw.yrp.nttdocomo.co.jp

Attachments: S2-030415rev2

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1. Overall Description:

SA2 thanks CN and SA1 for their liaison statements on SS barring SMS transfer over GPRS. According to SA1's requirements (S1-030241), SA2 approved the CR to TS23.060 for SS barring for SMS transfer over GPRS (S2-030415rev2).

2. Actions:

None.

3. Date of Next SA2 Meetings:

SA2#31, 7-11 April 2003, Seoul (Korea)
SA2#32, 12-16 May 2002, San Diego (USA)

TSG-SA WG2 #29
San Francisco, USA, 20th–24th January 2003

S2-030415rev21
(Revision of S2-030315)

CR-Form-v7

CHANGE REQUEST

⌘ **23.060** **CR** **423** ⌘ **rev** **2** ⌘ Current version: **5.4.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Addition of interaction between SMS over GRPS and supplementary service
Source:	⌘	NTT DoCoMo
Work item code:	⌘	TEI6
Date:	⌘	20/01/2003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘ The introduction of invocation of Call Barring Supplementary Service (CB SS) for SMS over GPRS was agreed at SA1#18 meeting(S1-022247) and it was pointed out that the minor changes are required to TS23.060 for the introduction of invocation of CB SS for SMS over GPRS(NP-020672). In order to satisfy the SA1 requirement, the definition of interaction between GPRS and Supplementary Service needs to be changed.

NOTE: This CR includes the changes of CR418 (S2-023321) ~~because CR418 is~~which was already approved at SA#18 but has not been implemented in TS23.060v5.4.0~~ even if it was approved by SA#18~~. To help differentiate the changes that were already approved in CR418 from the new changes proposed in this CR, the new changes are highighted in yellow.

Summary of change: ⌘ It is defined that the SGSN checks the subscriber data (e.g. ODB data or Call Barring Info) in case of MO SMS and the HLR checks the (e.g. ODB data or Call Barring Info) in case of MT SMS. Addtitionally, the error procedure when the MO SMS or MT SMS is barred is defined
The definition of invocation of Call Barring Supplementary Service for SMS over GPRS is added and it is clarified that the user control of such supplementary service by using Supplementary Service protocol is ~~outside the scope of 3GPP~~not supported over GPRS.

As part of CR418:
Subclause 16.1 is generalised to cover both the Iu and A/Gb mode in its description of the Point-to-Point Short Message Service over the PS domain. Further, a reference to 24.011 is added in clause 2.

Consequences if not approved:	⌘	

Clauses affected:	⌘	2, 16.1, 16.3			
Other specs affected:	⌘	**Y** / **N**		⌘	23.016, 23.088. 24.088 and 29.002
		X /	Other core specifications		
		/ **X**	Test specifications		
		/ **X**	O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<<First Modified Section>>

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. 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] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 01.61: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); GPRS ciphering algorithm requirements".

[3] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service description; Stage 1".

[4] 3GPP TS 23.003: "Numbering, addressing and identification".

[5] 3GPP TS 23.007: "Restoration procedures".

[5b] 3GPP TS 23.016: "Subscriber data management; Stage 2".

[6] GSM 03.20: "Digital cellular telecommunications system (Phase 2+); Security related network functions".

[7] GSM 03.22: "Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode and group receive mode".

[7b] 3GPP TS 23.122: "Non-Access Stratum functions related to Mobile Station (MS) in idle mode".

[8] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[8b] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2".

[9] 3GPP TS 21.905: "Vocabulary for 3GPP Specifications", (Release 4).

[10] Void.

[11] GSM 03.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[12] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[13] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[13b] 3GPP TS 24.011: "Point to Point (PP) Short Message Service (SMS) support on mobile radio interface".

<<Next Modified Section>>

16.1 Point-to-point Short Message Service

~~16.1.1 Point-to-point Short Message Service (A/Gb mode)~~

It shall be possible for a GPRS-attached MS to send and receive short messages over the PS domain ~~GPRS radio channels~~. An MS that is GPRS-attached and not IMSI-attached shall transfer SMs over the PS domain ~~GPRS channels~~. MSs that are both GPRS-attached and IMSI-attached shall transfer SMs over ~~GPRS channels~~the PS domain or over ~~non-GPRS control channels~~ the CS domain (if ~~non-GPRS control channels are~~ the CS domain is used, then paging for MT SMS may go through the SGSN).

The following two clauses define the operation of mobile-terminated and mobile-originated SMS routeing and transfer over ~~GPRS radio channels~~the PS domain. More detailed definitions are contained in ~~GSM 03.40~~ 3GPP TS23.040 [8].

16.1.1~~.1~~ Mobile-terminated SMS Transfer

Figure 96 and the description below show an example of a successful delivery of an SM to an MS over ~~a GPRS radio channel~~the PS domain.

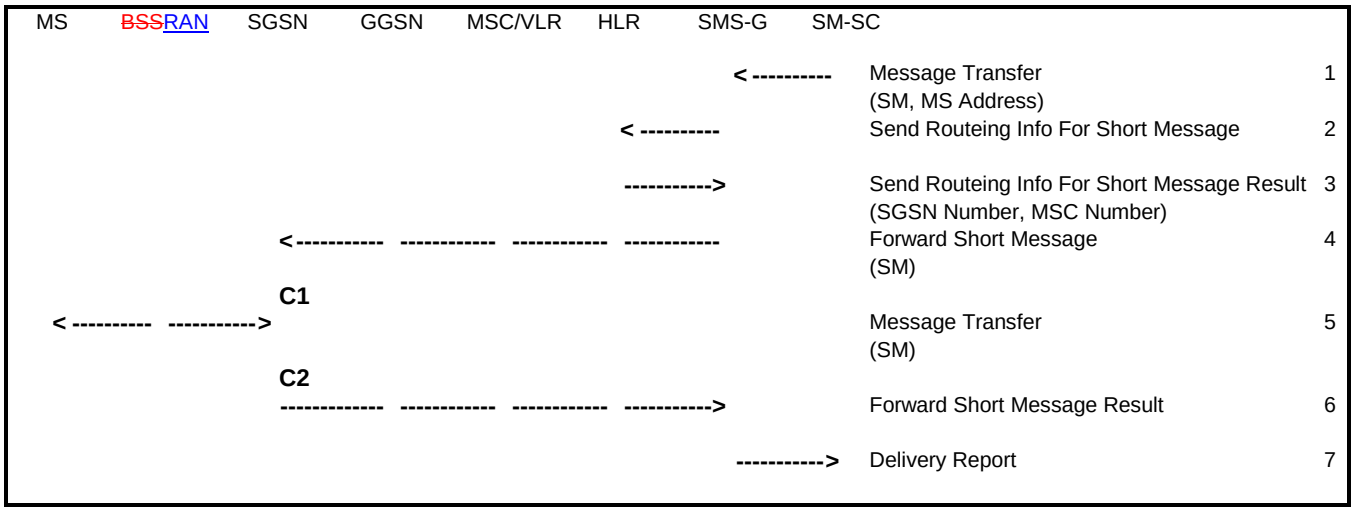

Figure 96: MT SMS Transfer, Successful

1) The short message service centre determines it shall send an SM to an MS. SM-SC forwards the SM to an SMS gateway MSC (SMS-GMSC).

2) SMS-GMSC examines the destination MS Address, and sends a Send Routeing Info For Short Message message to the relevant HLR.

3) HLR checks the subscriber data (e.g. ODB data and Call Barring Info) for the MS and determines that the MS is allowed to receive the SMS. The HLR returns a Send Routeing Info For Short Message Result message to the SMS-GMSC. The result may contain the MS's current SGSN Number, the MSC Number, or both. ~~More detailed procedure of HLR is defined in 3G TS 29.002.~~ If the result does not contain an SGSN Number (i.e., the HLR knows that the MS is not reachable via an SGSN), and if the result does contain an MSC Number, non-GPRS SMS delivery procedures are followed. If the result contains an SGSN Number, the SMS transfer proceeds according to the following events.

NOTE: SMS delivery via the SGSN is normally more radio resource efficient than SMS delivery via the MSC/VLR. The preferred delivery path is selected by SMS-GMSC operator-specific action.

4) SMS-GMSC forwards the SM to the SGSN.

5) SGSN transfers the SM to the MS on the RP~~,~~ and CP~~, LLC~~ layers, as defined in 3GPP TS 24.011.~~GSM 04.11 and GSM 04.64.~~

6) SGSN returns a Forward Short Message Result message to the SMS-GMSC indicating successful delivery of the SM.

7) SMS-GMSC returns a Delivery Report to the SM-SC indicating successful delivery of the SM.

CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

C1) CAMEL_T_SMS_INIT.

The procedure returns as result "Continue".

C2) CAMEL_T_SMS_DELIVERED.

This procedure does not return a result.

16.1.1.1~~.1~~ Unsuccessful Mobile-terminated SMS Transfer

The SGSN or the HLR may not be able to deliver the SM to the MS. This may for example happen when the MS is not attached to GPRS, ~~or~~ when the radio channel conditions are bad, or when the MT SMS is barred.

When the SGSN cannot deliver the SM to the MS, the SGSN sets the Mobile station Not Reachable for GPRS flag (MNRG), and returns a failure report to the SMS-GMSC. Based on the routeing information received from the HLR, the SMS-GMSC shall do one of the following:

- If an MSC/VLR is available for the MS, the SM is forwarded to the MS via the MSC/VLR. A successful delivery report shall be returned to the SM-SC.
- If an MSC/VLR is not available for the MS, the Message Waiting Indication information in the HLR shall be updated and an unsuccessful delivery report shall be returned to the SM-SC.

Figure 97 illustrates one possible traffic scenario when neither the SGSN nor the MSC is able to deliver the SM.

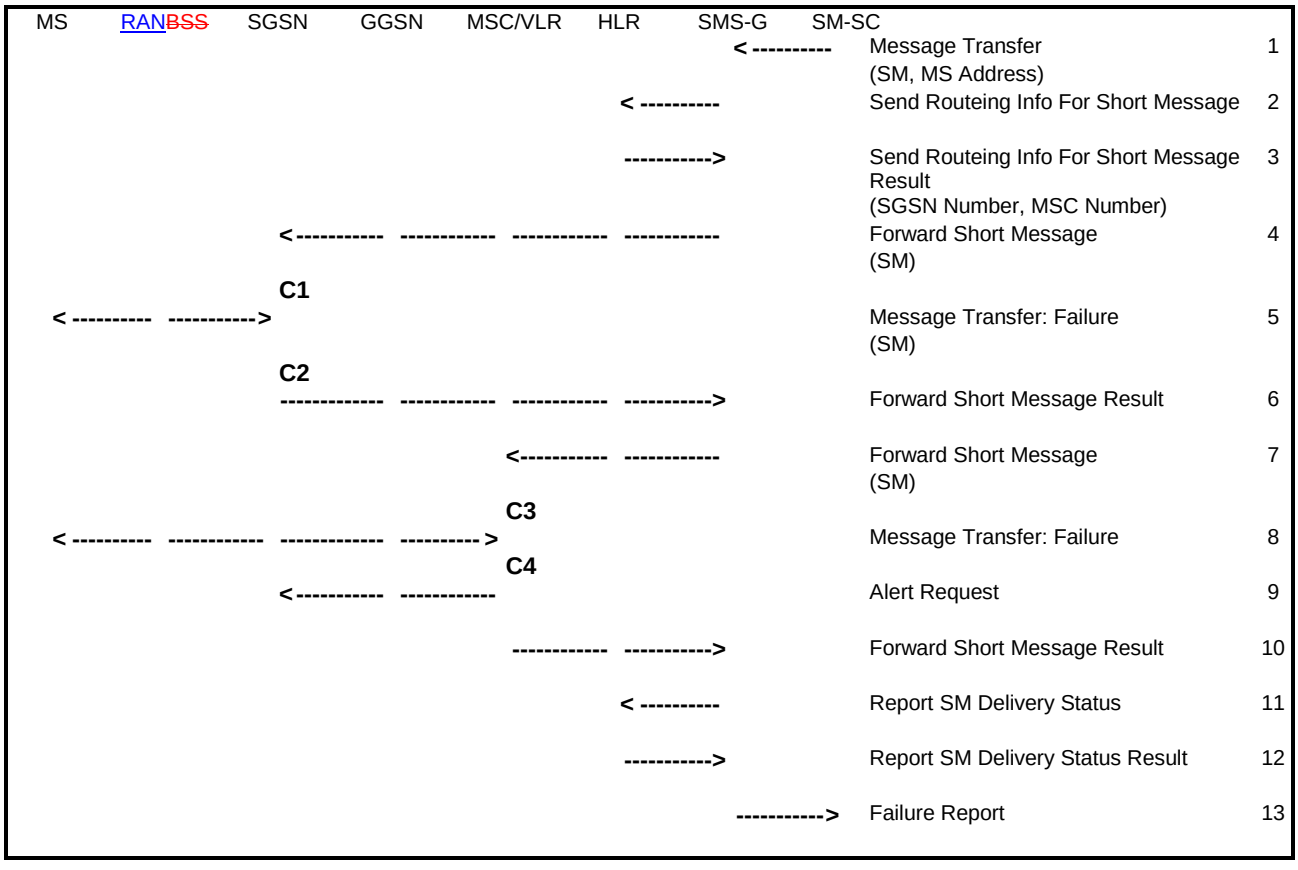

Figure 97: MT SMS Transfer, Unsuccessful

1) The short message service centre determines it shall send an SM to an MS. SM-SC forwards the SM to a SMS-GMSC.

2) SMS-GMSC examines the destination MS Address, and sends a Send Routeing Info For Short Message message to the relevant HLR.

3) HLR checks the subscriber data (e.g. ODB data and Call Barring Info) for the MS ~~and~~to determine~~s~~ whether the MS is allowed to receive the SMS. If the MT SMS is barred, the HLR returns a Send Routing Info for Short Message Error message with an appropriate cause. If the MT SMS is not barred, the HLR returns a Send Routeing Info For Short Message Result message to the SMS-GMSC. The Result contains an SGSN Number and an MSC Number. ~~More detailed procedure of HLR is defined in 3G TS 29.002.~~

4) SMS-GMSC forwards the SM to the SGSN.

5) SGSN attempts to transfer the SM to the MS, but fails.

6) SGSN sets MNRG and returns a Forward Short Message Result message to SMS-GMSC indicating unsuccessful delivery of the SM.

7) SMS-GMSC selects an alternative route for the SMS, and forwards the SM to the MSC/VLR.

8) MSC/VLR attempts to transfer the SM to the MS, but fails.

9) The MSC/VLR requests the setting of the NGAF at the SGSN.

10) VLR sets MNRF and returns a Forward Short Message Result message to the SMS-GMSC indicating unsuccessful delivery of the SM.

11) SMS-GMSC sends a Report SM Delivery message to the HLR.

12) HLR updates its Message Waiting Indication fields and returns a Report SM Delivery Result message to the SMS-GMSC.

13) SMS-GMSC returns a Failure Report to the SM-SC indicating unsuccessful delivery of the SM.

CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

C1) CAMEL_T_SMS_INIT.

The procedure returns as result "Continue".

C2) CAMEL_T_SMS_FAILURE.

This procedure does not return a result.

C3) CAMEL_T_SMS_INIT.

The procedure returns as result "Continue".

C4) CAMEL_T_SMS_FAILURE.

This procedure does not return a result.

Figure 69 shows that the SGSN sends a Ready for SM (MS Reachable) message to the HLR when the MS becomes reachable and MNRG is set in the SGSN. The SGSN indicates also to the MSC/VLR when the MS becomes reachable and NGAF is set in the SGSN. If the MNRF is set at the MSC/VLR, the MSC/VLR sends a Ready for SM (MS Reachable) message to the HLR. Reception of a Ready for SM message or Update Location message when MNRG is set in the HLR shall trigger the SMS alert procedure as defined in ~~GSM 03.40~~3GPP TS 23.040.

MNRG remains set in the SGSN independently of whether the MSC/VLR was successful in delivering the SM or not. This means that the SGSN in certain cases sends a Ready for SM message to the HLR when an MS becomes reachable via the SGSN, even if no SM is waiting. This causes a small amount of duplicate signalling between the SGSN and the HLR only.

16.1. ~~1.~~2 Mobile-originated SMS Transfer

Figure 98 and the description below explain the steps involved in sending an SM from an MS over the PS domain~~a GPRS radio channel~~.

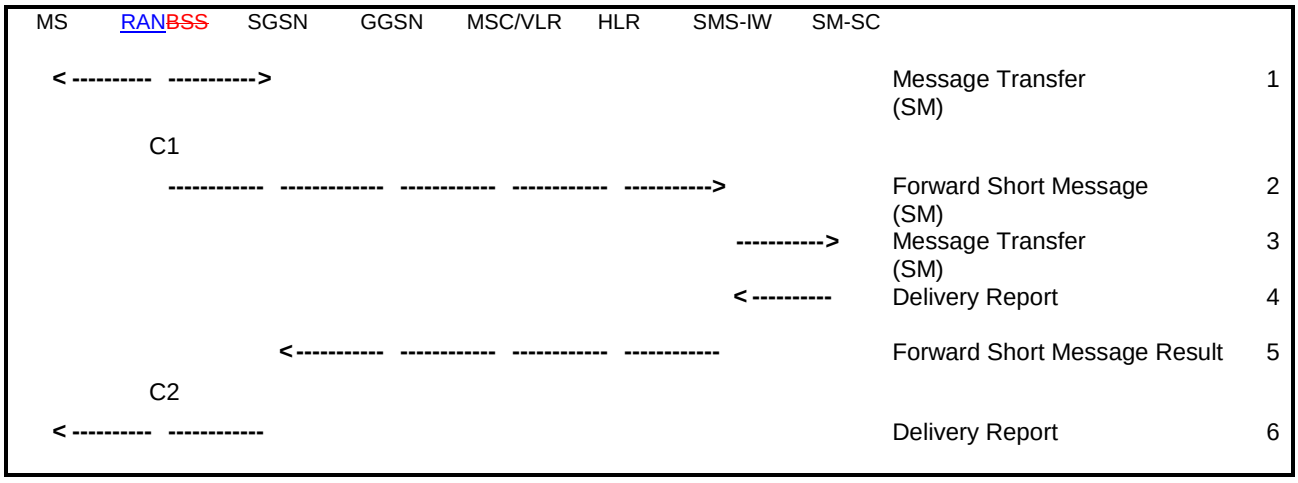

Figure 98: MO SMS Transfer, Successful

1) The MS has an SM to send, and transfers the SM to the SGSN via RP~~,~~ and CP~~, and LLC~~.
2) SGSN checks the MS subscription data (e.g. ODB data and Call Barring Info), and determines that the MS is allowed to originate the SMS. SGSN forwards the SM to a SMS interworking MSC (SMS-IWMSC). If the MS is~~n~~ not allowed to originate the SMS, the SGSN returns ~~the~~an RP Error message with an appropriate cause. ~~More detailed procedure of SGSN is defined in 3G TS29.002.~~
3) SMS-IWMSC passes the SM to the addressed SM-SC.
4) SM-SC returns a Delivery Report to the SMS-IWMSC indicating successful delivery of the SM.
5) SMS-IWMSC returns a Forward Short Message Result message to the SGSN indicating successful delivery of the SM.
6) SGSN returns a Delivery Report to the MS indicating successful delivery of the SM.

CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078.

C1) CAMEL_O_SMS_INIT.

The procedure returns as result "Continue".

C2) CAMEL_O_SMS_SUBMITTED

This procedure does not return a result.

~~16.1.2 Point-to-point Short Message Service (Iu mode)~~

~~SMS shall be supported via the control plane in the packet domain. The Iu mode SMS service is described in 3GPP TS 23.040.~~

<<Next Modified Section>>

16.3 Supplementary Services

For SMS over GPRS, only the invocation of Call Barring Supplementary Service is supported~~.~~ ~~t~~The user control by using the Supplementary Service protocol is not supported over GPRS.

~~No~~Other supplementary services are not defined for GPRS. Supplementary services may be available in the interworked packet data networks, but this is outside the scope of this specification.