

3GPP
Technical Specification Group Core Networks
Meeting #3, *Yokohama*, 21st - 23rd April 1999

Document **NP-99099**

Source: <SMG3 WPC>
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Title: set of six Liaison Statements to various 3GPP
Working Groups

Document for: Information

Attention: Agenda item <n>

The document gathers six Liaison Statements agreed during the 3GPP CN2 meeting held in Issy-les-Moulineaux, in the week 22 - 26 March 1999. In the interest of readability, every LS starts with a new page.

**3GPP TSG-N WG2
ETSI STC SMG3 Working Party 'C'
Joint Meeting
Issy-les-Moulineaux, FRANCE
22 - 26 March 1999**

Tdoc 3GPP N2-99224

**To: 3GPP TSG S1
ETSI SMG1**

Source: Vodafone

Title: Proposed Liaison statement on CAMEL triggering criteria

The joint meeting of ETSI SMG3 WP'C' and 3GPP TSG N2 considered a change request to GSM 03.78 for CAMEL phase 2. This change request proposed a change to the text of GSM 03.78 to align the requirements for triggering criteria with those in GSM 02.78 v6.3.0. One of the changes, to refine the definition of a match between a dialled number and the stored dialled number string in the criteria so that the type of number for each of the two numbers has to be the same, was straightforward. However there was some concern about the restriction that the type of number which can be stored in the triggering criteria can be only "international" or "unknown". This was felt to be too tight a constraint, because the protocol for the transport of the dialled number from the MS to the network allows the transport of other types of number. Even though the MMI specified in GSM 02.30 defines only the possibility to instruct the MS to send numbers in "unknown" or "international" format, automatic applications running in the MS or an attached terminal could cause the MS to send a number in format other than "unknown" or "international".

We recognised that for CAMEL phase 2 it is probably too late to specify a relaxation of the constraints to allow other types of number to be specified in the triggering criteria, because this would destabilise the CAMEL phase 2 specifications. However:

For CAMEL phase 2, we recommend that the stage 1 specification should include a "health warning" to service designers, that the MS might send a number which is not in "international" or "unknown" format, and this would cause unexpected results if triggering criteria are set to handle only "international" or "unknown" format numbers;

For CAMEL phase 3, we recommend that the stage 1 specification should be extended to allow the use of a larger (but still finite) set of number formats in the definition of triggering criteria, to recognise all the number formats which the access protocol can transport from the MS to the network. If TSG-S1 agree to this principle, TSG-N2 will produce a list which enumerates the possible number formats which the MS can send to the network. This list can then be used to define the number formats which can be used for triggering criteria.

The text of a possible "health warning" for CAMEL phase 2 follows.

Service designers should note that the MS can send dialled numbers to the network in other formats besides "international" or "unknown". If triggering criteria rely on the MS sending only "international" or "unknown" format numbers, the service behaviour will be unexpected if the MS sends a number which is not in "international" or "unknown" format.

In view of the need to stabilise the CAMEL phase 2 specifications, SMG1 are asked to include the "health warning" in the stage 1 specification for CAMEL phase 2 as a matter of urgency, so that it can be approved by SMG #29.

TSG-S1 are asked to agree to the principle of allowing additional number formats to be used in triggering criteria as a matter of urgency, so that TSG-N2 can progress the stage 2 definition at their next meeting, which is in the week 17 - 21 May.

3GPP CN WG2/ETSI SMG3 WPC
Issy-les-Moulineaux, France
22 - 26 March, 1999

Tdoc 3GPP N2-99248

To **TSG-SA2**
CC

Title: **Proposed Liaison Statement on Turbo-Charger and Super-Charger**

Source: **Nortel Networks**

It has been brought to TSG-CN2s attention that UMTS 23.20 details three mechanisms for reducing the signalling load associated with roaming subscribers. The three mechanisms are the GLR, Turbo-Charger and Super-Charger. At the last TSG-CN2 meeting a draft GLR feasibility study was reviewed.

TSG-CN2 kindly requests TSG-SA2 to provide guidance on whether similar studies should be initiated for Turbo-Charger and Super-Charger, and to provide work items for these studies if necessary.

**3GPP TSG-CN WG2
ETSI SMG3 Working Party 'C'
Joint Meeting
Issy-les-Moulineau, France
22 - 26 March, 1999**

Tdoc 3GPP N299264

To: TSG-SA2

Source: NEC

Title: Proposed LS on out-of-band transcoder control

TSG-CN2 would like to inform TSG SA2 that TSG CN2 is currently studying the feasibility of out-of-band transcoder control in the UMTS/CN. A copy of the 1st draft of the TR on out-of-band transcoder control is attached to this LS.

Source: NEC
Title: Technical Report on out-of-band transcoder control
Version: 0.0.1

This is the first draft of the technical report on out-of-band transcoder control in the UMTS CN. This report is made based on the N2-99153 report (Summary report of TSG-N plenary meeting) such as presented in the 3GPP TSG-CN WG2 meeting held in 22nd of March 1999.

1. Intellectual Property Rights

[Editor's note: TBD]

2. Foreword

[Editor's note: TBD]

3. Introduction

In order to improve voice quality for mobile-to-mobile calls (MS-MS calls) in GSM Phase 2+ networks, Tandem Free Operation (TFO) using in-band signalling has been specified. The TFO mode of operation could also be used to reduce the transmission bandwidth between Mobile services Switching Centres (MSC). The equivalent function in Japan's PDC (Personal Digital Cellular) network is known as Transcoder Bypass. But, this function is created based on the out-of-band signalling (i.e. by the PDC-MAP protocol).

On the other hand, the UMTS may be going to provide many transcoder types. In order to accommodate to this enhancement, the in-band transcoder control may have a limit to handle multiple transcoder types since this method uses the limited unused spare area in PCM coded form.

This TR introduces the out-of-band transcoder control to be supported for UMTS.

The UMTS Phase 1 network operator should have the option to implement the Transcoder Control by In-band control, out-of-band control or both.

4. Scope

This TR provides the procedure of out-of-band transcoder control and the expected benefits and expected complexities in order to provide this function for the UMTS/IMT-2000.

5. Reference

- | | |
|---------------------|--|
| GSM 02.53 ver.7.0.0 | Digital cellular telecommunications system (Phase 2+); Tandem Free Operation (TFO); Service description; Stage1 |
| GSM 03.53 ver.7.0.0 | Digital cellular telecommunications system (Phase 2+); Tandem Free Operation (TFO); Service description; Stage 2 |

6. Definitions and Abbreviations

Transcoder: The equipment to convert the signal format between radio related signalling (mobile side) and general signalling format used in the PLMN. An example of the transcoder is voice codec equipment.

Transcoder Control: In case of mobile to mobile call, two transcoders intervened in the PLMN may be freed or may be needed depending on a call situation. The method for both freeing the transcoders and inserting the transcoders in the PLMN network is defined as the transcoder control.

7. The capabilities required for out-of-band transcoder control

The following three items are required to support out-of-band transcoder control;

1. Negotiation

In case of mobile to mobile call, the negotiation executed between two MSCs to exchange transcoder type information being used. Generally, This negotiation is executed during the call establishment phase.

2. Transcoder freeing

In accordance with the negotiation (described above), the action in the MSCs to free two intervened transcoders in a call and configures through connection between two mobiles. Generally, This procedure is executed after the negotiation procedure.

3. Transcoder insertion

After a call has been configured the transcoder through connection by transcoder freeing, the transcoders in the two MSCs are inserted in a call and configure the two transcoder intervened connection. This procedure is executed in case the communication environment has been changed by any reasons and encountered with difficulties to continue the transcoder through connection service. (Ex. Call interruption caused by supplementary service)

8. Procedure of out-of-band transcoder control

[Editor's note: Under studying.]

9. The cost benefits

[Editor's note: The cost benefits with comparing to the in-band transcoder control on the following views will be included.

-Advantage to accommodate with further transcoder type expansion.

-Other possible cost benefits.]

10. Modification of the 3GPP specification

[Editor's note: Under studying]

3GPP TSG-CN WG2
Issy Les Moulinaux, France
22 - 26 March 1999

Tdoc 3GPP N2-99 275

Source: TSG-CN-WG2
Title: LS on Called Party Number Modification Check in CAMEL
To: TSG-SA1

In Stage 2 specification for CAMEL ph2 there is a check whether the Called Party Number, delivered to network from CSE in response to report of unsuccessful cases and of call disconnection from B-Side, is different from the one used for call set up.

If it is different, call set up is pursued with modified parameters.

If the Called Party Number received in the network is the same, normal call handling is continued, i.e. call is released or forwarded as appropriate.

This check was introduced to prevent any looping that could be caused by CSE sending to VPLMN/IPLMN repeatedly the same Called Party Number.

With the introduction of NA Equal Access Parameters in CAMEL ph2 the problem is arisen that this check prohibits consecutive trials to set-up the call with a different carriers used.

TSG-CN-WG2 inform TSG-SA1 that they do not intend to change the behaviour of CAMEL ph2.

TSG-CN-WG2 ask TSG-SA1 to consider whether there is any service requirement which would lead to a change in the handling and to update the stage 1 specification for CAMEL appropriately.

Issy-les-Moulineaux, France
22 - 26 March, 1999

To SA1
CC
Title: **Liaison Statement on Service Requirements for DTMF user interaction**
Date 24-MAR-1999
Source N2

1. Background

In order to allow a CAMEL phase 3 subscriber to initiate certain operations performed by the CSE, DTMF user interaction has to be detected during a call, analysed and reported to the CSE.

During some detailed technical discussions in WG2, it could not be clarified from the current CAMEL phase 3 draft stage 1 what the exact service requirements on user interaction via DTMF were. The question arose, whether the mid call detection point can be reached only when a connection is in the active state, i.e. Answer has been received, or whether that DP can also be reached from the Alerting state.

2. Discussion

It has been recognized that in the mobile environment it is generally not possible to send DTMF before the MS has received an Answer message.

There are however situations where the mobile station is in an answered state, but due to preceding IN call handling another party is not in an answered but in the alerting state. This happens for instance if after an inband user interaction with an SRF a new connection is initiated. A user could possibly wish to act upon that connection even before it is answered by a B party, e.g. put it on hold. Depending on the technical solution there would be the service restriction, that the Call Party Handling operation can be invoked via DTMF only after the B Party has answered the call.

3. Conclusion

We ask TSG-SA1 to consider the latter scenario and indicate whether there is a service requirement for DTMF user interaction during the alerting phase of a connection. The benefit of accepting the service restriction (an example of which was given above) is a reduced technical specification effort for CAMEL phase 3.

3GPP TSG-CN WG2
ETSI STC SMG3 Working Party 'C'
Issy les Moulineaux, FRANCE
22nd -26th March 1999

Tdoc 3GPP N2-99 277

Title: Liaison Statement on the Pre-paging Feasibility Report

To: TSG SA WG2

Copied to: TSG SA WG1, TSG CN WG1

From: NEC Technologies (UK), Fujitsu Telecom Europe (UK)

TSG CN WG2 would like to inform TSG SA WG2 that TSG CN WG2 is currently studying Pre-paging Work Item i.e. the application of pre-paging to the UMTS CN. A copy of the first draft of the Pre-paging Feasibility Report is attached to this LS.

The schedule for this Work Item is that the completed Pre-paging Feasibility Report will be presented for approval at the Edinburgh meeting of TSG CN WG2 in May and at the TSG CN meeting in June.

3GPP TSG-CN WG2
ETSI STC SMG3 Working Party 'C'
Issy les Moulineaux, FRANCE
22nd -26th March 1999

Tdoc 3GPP N2-99 176
Tdoc SMG3 3C99-476

Title: Draft Technical Report: Pre-paging in the UMTS CN

Source: NEC Technologies (UK), NTC (Nippon Telecommunications Consulting)

Agenda Item: 6.6

This is the first draft of the technical report on Pre-paging in the UMTS CN.

1. Intellectual Property Rights

2. Foreword

3. Introduction

In a GSM mobile terminated call, the called mobile station is not paged until after the SRI/PRN procedure is completed. This results in a call path being set up through the GSM network between the GMSC and the VMSC before the mobile station has been paged. In some circumstances this call path may turn out to have been unnecessary if the mobile station does not accept the call (e.g. because the mobile was out of coverage). This represents an inefficient use of network resources.

Pre-paging has been proposed as a means of using network resources in a more efficient manner. In this context, Pre-paging in GSM/UMTS networks refers to the case where the called mobile is paged during the SRI/PRN procedure, i.e. before the MSC/VLR returns the PRN to the GMSC.

Also, this report will study whether Pre-paging is a suitable mechanism to improve the accuracy of location and status information for CAMEL. If so, this could lead to improved services for CAMEL subscribers.

4. Scope

The purpose of this ETR is to study:

- 1) The potential applications of Pre-paging in GSM/UMTS networks
- 2) The impact of Pre-paging on the GSM/UMTS specifications.
- 3) The interaction of Pre-paging with the work carried out by SMG2 and SMG3 on Classmarks for UMTS (i.e. Service Classmark and Terminal classmark).

5. References

6. Definitions and Abbreviations

7. Applications of Pre-paging

The potential applications of Pre-paging in UMTS are as follows:

1. Basic Pre-paging (i.e. the more efficient use of network resources when mobile terminated calls do not complete)
2. Signalling of terminal capabilities to the GMSC in Mobile Terminated calls
3. Signalling of current radio environment related capabilities (i.e. GSM, UTRAN coverage area) to the GMSC.
4. Support of active location information retrieval for the CAMEL Any Time Interrogation (ATI) service

5. Extension of the scope of Early Call Forwarding on:
 - not reachable (mobile not responding)
 - subscriber busy
 - radio congestion

7.1 Basic Pre-paging

Pre-paging in GSM/UMTS networks refers to the case where the called mobile is paged during the SRI/PRN procedure, i.e. the MSC/VLR returns the PRN to the GMSC after the mobile has responded to the paging message. This is illustrated by the following diagram:

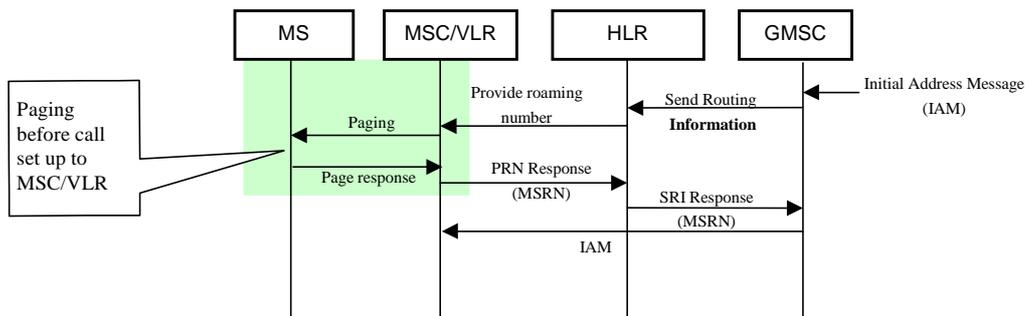


Figure 1 Basic Pre-paging in the GSM/UMTS network

The Pre-paging procedure will need to have the capability to control

- When the radio connection in the access network is to be released.
- Define the value of a supervision timer to manage the allocated radio bearer
- Control whether other normal MM/RR procedures (authentication, ciphering) can continue in parallel with incoming call setup after the initial Page Response is received from the MS. This will allow faster incoming call set-ups as access procedures in VMSC are executed in parallel with the core network procedures in GMSC.

The above control information will need to be transferred in the forward direction to the MSC/VLR. Thus the SRI and PRN messages will need to carry additional parameters.

The actual contents of the control parameters sent to the MSC/VLR are for further study.

7.2 Signalling of terminal capabilities to the GMSC/GGSN in Mobile Terminated Transactions

The ability to contact the MS for Pre-paging offers opportunities to obtain additional information from the MS in real-time very efficiently as part of generic Pre-paging procedures. This is an example of an enhanced service to CAMEL subscribers. Existing messages will be used where ever possible to “piggy-back” the additional information. The early sending of the MS terminal capabilities will be developed. This will enable decisions to be made in the core network at the earliest opportunity based on the actual status of the MS.

The Pre-paging procedures are likely to be part of the MM procedures (GSM 04.08) which are normally performed in response to Paging from the core network. This will be a one way flow of information of the MS terminal capabilities from the MS towards the core network.

The MS terminal capability information received in the core network (3G MSC/ 3G SGSN) will be transported transparently to the interrogating node in the core network (3G HLR and subsequently 3G GMSC / 3G GGSN) as part of the existing MAP procedures (GSM 09.02, GSM 03.18)

Thus the MS Terminal Capabilities will be transported to the core network in the following messages:

- Page Response (DTAP signalling)
- PRN Response (MAP signalling)
- SRI Response (MAP signalling)
- Also PSI Response (MAP), ATI Response (MAP) and Initial DP (CAP) will be affected.

The actual contents of the MS Terminal Capabilities fields are for further study. Its relationship to the similar features in GSM will need to be considered – e.g. MS Classmark, MExE Classmark etc.

The interaction with GSM Location Services (LCS) will need to be considered. It may be possible to also return the information of the actual location of the MS as part of the generic Pre-paging procedures.

7.3 Signalling of current radio environment related capabilities (i.e. GSM, UTRAN coverage area) to the GMSC/GGSN.

The ability to contact the MS for Pre-paging offers opportunities to obtain additional information from the serving BSS / RNS in real-time very efficiently as part of general Pre-paging procedures. This is an example of an enhanced service to CAMEL subscribers. Existing messages will be used where ever possible to “piggy-back” the additional information. The early sending of the RNS capabilities will be developed. This will enable decisions to be made in the core network at the earliest opportunity based on the actual status of the serving RNS.

This feature will enable the core network to determine the capability of the access network serving the MS i.e. whether GSM or UMTS coverage serves the MS. This real time information may be useful in the core network when there are functional differences in the access network (for example the location of the Transcoder).

These procedures are likely to be part of the BSSMAP/ RANAP procedures (GSM 08.08) which are normally performed in response to Paging from the core network. This will be a one way flow of information of the serving RNS capabilities from the RNC towards the core network.

The RNS capability information received in the core network (3G MSC/ 3G SGSN) will be transported transparently to the interrogating node in the core network (3G HLR and subsequently 3G GMSC / 3G GGSN) as part of the existing MAP procedures (GSM 09.02, GSM 03.18)

Thus the RNS Capabilities will be transported to the core network in the following messages:

- Complete Layer 3 message [Page Response] (BSSMAP/RANAP signalling)
- PRN Response (MAP signalling)
- SRI Response (MAP signalling)
- Also PSI Response (MAP), ATI Response (MAP) and Initial DP (CAP) will be affected.

The actual contents of the RNS Capabilities field are for further study. Its relationship to the similar features in GSM will need to be considered – e.g. MS Classmark, Network Node Capability (e.g. MSC capability) etc.

The interaction with GSM Location Services (LCS) will need to be considered. It may be possible to also return the information of the actual location of the MS as part of the generic Pre-paging procedures.

7.4 Support of active location information retrieval for the CAMEL Any Time Interrogation (ATI) service

[Editor's note: this application will be described in detail within this sub-section.]

This is an example of an enhanced service to CAMEL subscribers.

7.5 Extension of the scope of Early Call Forwarding

The scope of Early Call Forwarding could be extended by Pre-paging to include Early Call Forwarding on:

- not reachable (mobile not responding)
- subscriber busy
- radio congestion

This is an example of an enhanced service to CAMEL subscribers.

8. Interaction of Pre-paging with Existing Services

8.1 Interaction with OR-LCF

[Editor's note: The impact of Pre-Paging on the Optimal Routing for Late Call Forwarding service needs further study. It is possible that Pre-Paging may make some cases of OR-LCF redundant. But Pre-Paging will not replace OR-LCF for (CFNRy) Call Forwarding on No Reply.]

The Pre-paging procedure has some similarities with the OR-LCF procedures. However there are some significant differences between the two, i.e.:

- Pre-paging does not make use of the MAP message Resume Call Handling
- In Pre-paging the call is forwarded without routing to the visited network.

8.2 Interaction With Location Services

9. Compatibility of Pre-paging with GSM Release 98 Specifications

[Editor's note: This will study the compatibility of Pre-paging with GSM specifications.]

The existing GSM specifications are likely to be impacted by Pre-paging work item. Enhancements to the following specifications may be necessary:

- GSM 03.18
- GSM 03.78
- GSM 04.08
- GSM 08.08
- GSM 09.02

9.1 Basic Pre-paging

GSM 09.02 specifies the PRN timer within the HLR to have a value of 15-30 seconds. It is for further study whether this timer is suitable for Pre-paged calls.

10. Impact of Pre-paging on GSM Release 99 Specifications

[Editor's note: Describes the detailed changes required in GSM Release 99 to implement basic Pre-paging]

11. Conclusions