3GPP TSG CN Plenary Meeting #15   **NP-020083**
6th – 8th March 2002. Cheju, Korea.

Source:	**TSG CN WG3**
Title:	**CR to Rel-5 on Work Item SCUDIF**
Agenda item:	**9.13**
Document for:	**APPROVAL**

Introduction:

This document contains **2** CRs on **Rel-5** to Work Item **"SCUDIF"**, that have been agreed by **TSG CN WG3**, and are forwarded to TSG CN Plenary meeting #15 for approval.

Doc-2nd-	Subject	Spec	CR	Rev	Cat	Phase	Versi	Workitem
N3-020090	Service Change and Fallback from UDI Multimedia	27.001	071	5	C	Rel-5	5.0.0	SCUDIF
N3-020091	Service Change and Fallback from UDI Multimedia	29.007	046	4	C	Rel-5	5.0.0	SCUDIF

CR-Form-v6.1

CHANGE REQUEST

	⌘	**27.001** CR **71**	⌘**rev**	**5**	⌘	Current version:	**5.0.0**	⌘

Spec Title: General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)   ⌘

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Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network ☐   Core Network **X**

Title:	⌘	Service change and fallback for UDI/RDI multimedia calls
Source:	⌘	TSG_CN WG3
Work item code: ⌘		SCUDIF *Date:* ⌘ 2002-01-18

Category:	⌘	**C**	*Release:* ⌘	REL-5

Use <u>one</u> 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 <u>TR 21.900</u>.

Use <u>one</u> 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)*

Reason for change:	⌘	Allow service change and fallback for UDI/RDI 3G.324M multimedia calls
Summary of change: ⌘		Support for multimedia calls is updated.
Consequences if not approved:	⌘	Limited CS multimedia functionality

Clauses affected:	⌘	8.3.3.1, 8.3.3.2

Other specs affected:	⌘	**X** Other core specifications	⌘	TS 24.008, TS 29.007, TR 23.972
		☐ Test specifications		
		☐ O&M Specifications		

Other comments:	⌘	

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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.

*** Start of Modified Section ***

8.3.3 Indication of Compatibility Requirements to the PLMN

8.3.3.1 Indication in case of Mobile terminating calls

In support of:

- PSTN originated calls; and

- ISDN originated calls using 3,1 kHz audio Bearer Capability (BC); as well as

- ISDN originated calls using unrestricted digital Bearer Capability but not specifying all parameters for deducing a Bearer Service.

Mobile specific requirements to be dealt with in the Bearer Capability information element the call confirmed message has been introduced in the call control protocol (3GPP TS 24.008). This also allows for renegotiation of specific parameters at the beginning of the connection set-up process. The specific parameters are:

a) mobile specific requirements:

- Connection element (transparent/non transparent);

- Structure (note 1);

- Synchronous/Asynchronous (note 8);

- Rate adaptation/other rate adaptation (note 9);

- User information layer 2 protocol (note 1);

- Intermediate rate (note 2), (note 3);

- Modem Type (note 1), (note 3);

- User Rate (note 3);

- Compression ,

- Fixed network user rate, (note 3) (note 4);

- Other modem type, (note 3) (note 4);

- User initiated modification indication (note 4).

The following parameters are indicated by the MS to the network, only:

- Radio Channel Requirement;

- Acceptable channel codings (note 5);

- Maximum number of traffic channels, (note 5);

- Wanted air interface user rate (note 6) (note 7);

- Asymmetry preference indication (note 7).

NOTE 1: This parameter is correlated with the value of the parameter connection element.

NOTE 2: For non-transparent services this parameter is correlated with the value of the parameter negotiation of intermediate rate requested.

NOTE 3: Modification of these parameters may be proposed by the MS. The Network may accept it or not.

NOTE 4: This parameter shall be included by the MS only in case it was received from the network.

NOTE 5: This parameter shall be included only in case the parameter 'fixed network user rate' is included.

NOTE 6: This parameter shall be included only for non-transparent services and in case the parameter 'fixed network user rate' is included.

NOTE 7: This parameter has to be included if EDGE channel coding(s) are included in Acceptable channel codings. In cases where this parameter would not otherwise be included, the value is set to 'Air interface user rate not applicable' or 'User initiated modification not requested' or "No preference".

NOTE 8: For FTM and PIAFS, this parameter may be negotiated as in table B.4e. How the subscription for BS20 is assured, is an operator matter.

NOTE 9: For FTM, PIAFS or Multimedia, this parameter may be negotiated as in table B.4f.

b) requirements with effects at the partner terminal:

- Number of data bits;

- Number of stop bits;

- Parity.

The MS indicates the radio channel requirement in the call confirmed message. If the MS indicates the support of "dual" (HR and FR channels) the final decision, which radio channel is chosen, is done by the network in an RR message. The radio channel requirement is ignored in UTRAN Iu mode, see Table B.5a in Annex B.

If the network proposes optional support of both transparent and non transparent connection elements, but does not indicate a user information layer 2 protocol, the MS shall set the appropriate value, if choosing non transparent in the call confirmed message and out-band flow control is not requested, see B.1.1.2.

Additionally the values of the parameters structure, modem type and intermediate rate have to be set in conformance with the values of the parameters radio channel requirements, negotiation of intermediate rate requested and connection element.

Subclause B.1.1.2 and table B.1 in the annex B describe the negotiation procedure. Annex B table B.4 describes the selection of the modem type and the dependence on the value of the parameter connection element. Annex B table B.4 describes the selection of the intermediate rate and user rate and their dependence upon the value of the NIRR parameter and the equipment capabilities.

The following MT cases can be deduced from the individual call set-up request conditions:

a) If the set-up does not contain a BC information element, the MS in the call confirmed message shall include any BC information (single or multiple BC-IE). In case of multiple BC-IEs one BC-IE shall indicate the information transfer capability "speech". A ~~speech~~ 3,1 kHz multimedia BC-IE together with a ~~3,1kHz multimedia~~ speech BC-IE indicates the support of a fallback to speech. A UDI/RDI multimedia BC-IE together with a speech BC-IE indicates the support of service change and fallback (ref. to 3GPP TS 29.007 and 3GPP TS 24.008).

b) If the set-up message contains a single BC-IE, the MS in the call confirm message shall use either a single BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified in annex B, no BC-IE, if it agrees with the requested ones.

c) If the set-up contains a multiple BC-IE, the MS in the call confirmed message shall use either a multiple BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified in annex B, no BC-IE, if it agrees with the requested ones.

- In case of a 3,1kHz multimedia setup the MS may either accept the possibility of a fallback to speech by responding with two BC-IEs, or with no BC-IEs, or turn the call to a speech call by sending only a speech BC-IE in the call confirm message or turn the call to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE, in the call confirm message.

- In case of a UDI/RDI multimedia setup, the MS may either accept the possibility of service change by responding with two BC-IEs, or with no BC-IEs, or turn the call to a speech call by sending only a speech BC-IE in the call confirm message, or turn the call to a multimedia call by sending only a multimedia BC-IE in the call confirm message.

- •⎯-Alternatively, a single BC-IE, containing fax group 3 only, shall be used if a multiple BC-IE requesting speech alternate fax group 3 is received and the MS is not able to support the speech capability. Annex B, table B.7, describes the negotiation rules.

If the BC-IE contains 3,1 kHz ex PLMN, the MS is allowed to negotiate all mobile specific parameter values listed above. If the BC-IE contains facsimile group 3, the MS is allowed to negotiate the connection element (transparent/non transparent) only. In any case, if the set-up message requests a "single service", the MS shall not answer in the call confirmed message requesting a "dual service" and vice versa.

However, for dual services with repeat indicator set to "circular (alternate)" or to "service change and fallback", the MS may change the sequence of dual BC-IEs within the call confirmed message (preceded by the same value of the repeat indicator), if it wants to start with a different Bearer Capability than proposed by the network as the initial one.

In addition, the MS may propose to the network to modify User Rate, Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call.

If the BC-IE received from the network contains the parameters 'fixed network user rate', 'other modem type' and possibly the 'user initiated modification', the MS may either:

a) if in A/Gb mode, discard these parameters; or

b) include the possibly modified values for the 'fixed network user rate' and 'other modem type' in the BC-IE of the call confirmed message. The network might accept or reject the modified values. In this case the MS shall also include the parameters 'maximum number of traffic channels' and 'acceptable channel codings'. Additionally for non-transparent services, the MS shall also include the parameters 'wanted air interface user rate' and the 'user initiated modification indication'.

In case a), the MS shall use the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

In A/Gb mode case b), a single slot configuration shall be used by the MS, in case the 'maximum number of traffic channels' is set to "1 TCH" and the 'user initiated modification indication' is set either to "user initiated modification not required" or to "user initiated modification up to 1TCH may be requested"; other wise the MS shall use a multislot configuration (reference 3GPP TS 44.021).

In case the 'acceptable channel codings' is indicated by the MS, the decision which channel coding is used is done by the network and indicated to the mobile station with a RR message. This RR message may also assign an asymmetric channel coding. The 'acceptable channel codings' parameter takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. Also the intermediate rate and user rate per traffic channel in a multislot configuration are not indicated by the 'intermediate rate' and 'user rate' parameters of the BC-IE, but depend on the chosen channel coding only.

If the MS receives a BC-IE in the SETUP message containing the parameters 'fixed network user rate', 'other modem type', the MS may include these parameters in the BC-IE of the CALL CONFIRMED message (i.e. octets 6d, 6e, 6f, and 6g ref. 3GPP TS 24.008), with parameter values negotiated according to Annex B. If no BC-IE is received in the SETUP message, the MS may include these parameters in the CALL CONFIRMED message. However, in this case, the network may release the call if it does not support these parameters.

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (ref. to 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T V.80 inband signaling) in order to cause the TE to use stuffing to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.2 Indication in case of Mobile originating calls

In support of mobile originating calls the values of BC-IE parameters are requested in the set-up message from the MS. If the MS indicates the support of both transparent and non transparent connection elements the network shall return its choice in the call proceeding message. The MS is not allowed to indicate support of both transparent and non transparent, if the MS also requests out-band flow control, i.e. it does not indicate a layer 2 protocol.

Additionally the value of the parameter modem type has to be set depending on the value of the parameter connection element as described in annex B, table B.4a.

The set-up message contains a single or multiple BC-IE. In case of multiple BC-IEs one BC-IE shall indicate the information transfer capability "speech".

In case of a 3,1 kHz multimedia call, the setup message contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a 3,1 kHz multimediaspeech BC-IE and a speech3,1kHz multimedia BC-IE to indicate the support/request of a fallback to speech (ref. 3GPP TS 29.007 and 3GPP TS 24.008).

In case of UDI/RDI multimedia call, the setup message contains either a multimedia BC-IE indicating a multimedia only call request, or both a multimedia BC-IE and a speech BC-IE (in any order) to indicate the support of service change and fallback (ref. 3GPP TS 29.007 and 3GPP TS 24.008). The latter is not applicable to multimedia calls with FNUR = 32.0 kbit/s.

If the set-up message requests a "single service", the network shall not answer in the call proceeding message requesting a "dual service" and vice versa. Alternatively the network shall answer with a single BC-IE containing fax group 3 if a multiple BC-IE requesting speech alternate fax group 3 is received but the network does not allow the use of this alternate service. Annex B, table B.7, describes the negotiation rules.

-If the MS requests a "dual service", the network is not allowed to change the sequence of the service.

If the setup message requests a multimedia service with fallback, the network may return both BC-IEs in the same order, or a single BC-IE if fallback, service change or one of the requested services are not allowed.

If the set-up message indicates that negotiation of intermediate rate is requested then the network shall behave as described in annex B, table B.4b.

Unless otherwise specified in annex B, if no BC-IE parameter needs negotiation it is up to the network if it sends a CALL PROC message (with or without a BC-IE) towards the MS or not.

For multislot, TCH/F14.4, and EDGE operations and in UTRAN Iu mode the MS shall include an appropriate set of the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH' and 'acceptable channel codings' in the BC-IE of the SETUP message. If EDGE channel coding(s) are included in ACC in case of transparent calls, the 'Wanted air interface user rate'-parameter shall be set to 'Air interface user rate not applicable' and the 'User initiated modification indication'-parameter to 'User initiated modification not requested'. In a non-transparent multislot operation, the MS shall also include the parameters 'wanted air interface user rate' and 'user initiated modification indication' in the BC-IE of the SETUP message. In a non-transparent TCH/F14.4 or EDGE operation or in UTRAN Iu mode the MS shall also include the parameter 'wanted air interface user rate'. In non-transparent EDGE operation the MS shall also include the parameter 'asymmetry preference indication'. It shall also set the other parameters of the BC-IE (i.e. 'user rate') to values identifying fall-back values. Depending on the network two situations can be distinguished:

a) The network supports the requested operation:

- in this case the network shall include the parameter 'fixed network user rate', 'other modem type' and possibly 'user initiated modification' in the BC-IE(s) of the CALL PROCEEDING message, irrespective whether or not they contain modified values or just a copy of the received ones;

- the 'acceptable channel codings' indicated by the MS in the SETUP message takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. The intermediate rate per traffic channel and the user rate per traffic channel is dependent on the chosen channel coding only. The chosen channel coding is indicated to the mobile station by the network with an RR message.

b) The network does not support the requested operation:

- in this case, in A/Gb mode, the BC-IE of the CALL PROCEEDING message does not contain the parameters fixed network user rate' and 'other modem type' or no BC-IE is included in the CALL PROCEEDING message at all. The mobile station shall then discard the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH', 'acceptable channel codings' 'wanted air interface user rate' and 'user initiated modification indication' sent with the SETUP message and apply the fall-back bearer service.

In case a), a single slot configuration shall be used by the MS, in case the 'maximum number of traffic channels' is set to "1 TCH" and the 'user initiated modification indication' is set either to "user initiated modification not requested" or to "user initiated modification up to 1TCH may be requested".

In case b), The MS shall use the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (ref. to 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T V.80 inband signaling) in order to cause the TE to use stuffing to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.3 Differences in validity of BC parameter values in A/Gb mode and UTRAN Iu mode

The validity of a BC parameter value, either in the SETUP or CALL CONFIRM message, may differ from A/Gb mode to UTRAN Iu mode. Certain parameters are irrelevant in UTRAN Iu mode and any value given is valid and ignored. These parameters may be available in the BC IE. For those parameters that are relevant in UTRAN Iu mode and A/Gb mode, certain values may be invalid in one of the systems. Invalid parameter values may cause rejection of the BC and subsequent release of the call.

Parameters that are ignored in UTRAN Iu mode may be set to default values, or to specific values in view of an eventual handover to A/Gb mode. Parameter values that are invalid in one system may result in unsuccessful handover from the other system.

Table B.5a in Annex B lists parameters that are ignored in UTRAN Iu mode and parameter values which validity is different in A/Gb mode and UTRAN Iu mode.

*** End of Modified Section ***

CR-Form-v6.1

CHANGE REQUEST

| ⌘ | **29.007** CR **46** | ⌘rev | **4** | ⌘ | Current version: | **5.0.0** | ⌘ |

Spec Title: General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Service change and fallback for UDI/RDI multimedia calls
Source:	⌘	TSG_CN WG3
Work item code: ⌘	SCUDIF	*Date:* ⌘ 2002-01-18
Category:	⌘ **C**	*Release:* ⌘ REL-5

Use one of the following categories:
 F *(correction)*
 A *(corresponds to a correction in an earlier release)*
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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)

Reason for change:	⌘	Allow service change and fallback for UDI/RDI 3G.324M multimedia calls
Summary of change: ⌘	The support for multimedia calls is updated
Consequences if not approved:	⌘	Limited CS multimedia functionality

Clauses affected:	⌘	10.4

Other specs affected:	⌘	**X** Other core specifications	⌘	TS 24.008, TS 27.001, TR 23.972
		☐ Test specifications		
		☐ O&M Specifications		

Other comments:	⌘	

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*** Start of Modified Section ***

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10.4   3G-H.324/M calls over UDI/RDI

3G-H.324/M calls provide UDI/RDI (e.g. 32 kbit/s transparent data, 56 kbit/s transparent data or 64 kbit/s transparent data). H.223 and H.245 flow is not terminated in the MSC.

3G-H.324 calls over 64 kbit/s transparent data and 56kbit/s transparent data can be connected to H.324/I calls over UDI/RDI. H.223 protocol is transparent to IWF.

In case of 3G-H.324M calls over 32 kbit/s, IWF which performs rate adaptation between 64kbit/s and 32kbit/s is used. Rate adaptation is based on ITU-T I.460.

The support of IWF which transcodes the multiplexes and the content of control, audio, video and data in MSC is FFS.

10.4.1   Mobile originated multimedia call

10.4.1.1   Call setup

The setup message sent by the MS contains either a multimedia BC-IE indicating a multimedia only call request (*i.e.* no fallback / service change allowed) or both a speech BC-IE and a multimedia BC-IE to indicate the support of fallback and service change (ref. to TS 27.001 and TS 24.008).

The MSC shall not accept a requested service to which the user is not provisioned for. Provided that the user is provisioned for the BS30 bearer service – and/or speech the following applies :

- in case of a multimedia only BC-IE, the MSC shall either accept the setup as such or with modifications sent to the MS in the call proceeding message (ref. to 3GPP TS 27.001) ;

- in case of both a speech BC-IE and a multimedia BC-IE in either order, the MSC shall either accept the possibility of fallback or service change by responding with the two BC-IEs in the same order as received or no BC-IEs, or turn the call to a speech call by sending only a speech BC-IE in the call proceeding message, or turn the call to a multimedia only call by sending only the multimedia BC-IE in the call proceeding message (ref. to 27.001).

10.4.1.2   Fallback after setup

If the MSC has accepted the possibility of a fallback and service change, and the transit network or the terminating side does not allow one of the bearers, the MSC shall initiate an In-Call Modification procedure (ref. to 3GPP TS 24.008) in order to fallback to the allowed mode. As a result of the procedure, the radio and network resources are modified and the relevant channel is set up between the calling MS and the fixed network. If the fallback fails, *e.g.* due to an unsuccessful In-Call Modification procedure, the MSC shall clear the call.

10.4.1.3   User initiated service change after setup

If the MSC has accepted the possibility of a service change and the user initiates an In-Call Modification procedure (ref. to 3GPP TS 24.008) in order to change the service either from speech to multimedia or vice-versa, the MSC shall invoke the service change as an In-Call Modification procedure. As a result of the procedure, the radio and core network resources are modified in order to comply with the requested service change.

10.4.2   Mobile terminated multimedia call

10.4.2.1   Call setup

If the user is provisioned to use both the transparent bearer service (for multimedia) and the speech teleservice, and if the network supports both services and the service change functionality, the MSC shall send both a multimedia BC-IE

and a speech BC-IE in the setup message to the mobile station. In case the MSC receives a multimedia call, the multimedia BC-IE is prioritised (first BC). In case the MSC receives a speech call, the speech BC is prioritised.

If the user is provisoned to use only the transparent bearer service and if the network supports the multimedia service, the MSC shall only send a multimedia BC-IE, which results in a fallback to multimedia if the call was a speech call.

If the user is provisioned to use only the speech teleservice, the MSC shall only send a speech BC-IE, which results in a fallback to speech if the call was a multimedia call.

In case both a speech BC-IE and a multimedia BC-IE are included in the setup message, the mobile station shall either accept the service change capability by responding with two BC-IEs in the same or reversed order, or with no BC-IEs, or turn the call to a speech call by sending only a speech BC-IE in the call confirm message, or to a multimedia only call (*i.e.* no service change allowed) by sending only a multimedia BC-IE in the call confirm message.

In case of a multimedia only BC-IE in the setup, the MS may accept the setup as such or with modifications sent to the MSC in the call confirm message.

10.4.2.2   User initiated service change after setup

If the MSC supports the possibility of a service change and the user initiates an In-Call Modification procedure (ref. to 3GPP TS 24.008) in order to change the service either from speech to multimedia or vice-versa, the MSC shall invoke the service change as an In-Call Modification procedure. As a result of the procedure, the radio and core network resources are modified in order to comply with the requested service change.

*** End of Modified Section ***