

TSG-RAN Meeting #13
Beijing, China, 18 - 21, September, 2001

TSGRP#13(01) 0595

Title: Agreed CRs to TS 25.415

Source: TSG-RAN WG3

Agenda item: 8.3.3/8.3.4/9.4.3

RP Tdoc	R3 Tdoc	Spec	CR_Num	Rev	Release	CR_Subject	Cat	Cur_Ver	New_Ver	Workitem
RP-010595	R3-012528	25.415	062	3	Rel-4	lu UP version handling (Rel 4)	F	4.1.0	4.2.0	TrFO

CHANGE REQUEST

⌘ **25.415 CR 062** ⌘ rev **3** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ lu UP version handling (Rel 4)		
Source:	⌘ R-WG3		
Work item code:	⌘ TrFO	Date:	⌘ 2001-08-29
Category:	⌘ F	Release:	⌘ Rel-4
<p>Use <u>one</u> of the following categories:</p> <p>F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>	

Reason for change:	⌘ The MSC-Server shall, as a consequence of the OoB negotiation, request the appropriate user plane version(s) instead of (all) the user plane mode versions supported by the MGW to ensure that the proper user plane version supporting TrFO will be initialised.
	The CN shall therefore request the user plane version(s) that support TrFO and not all supported by the MGW.
	Consequently, the RNC shall indicate, within the initialisation frame, all the user plane versions it supports among those that have been requested by the CN.
	<u>In the split Rel4 cs architecture (MSC-Server – MGW) the peer lu UP entity within the CN (i.e. MGW) shall be pre-configured. This can be done with the lu-UP-CONFIG primitive, as described within Annex B2. This primitive shall provide information about the set of required UP versions as well. This is reflected within changes for section B.2.1.</u>
	This CR is in line with approved CRs to 23.153 (CR024r1, N4-010683) and 29.232 (CR007r1, N4-010691), where the issue raised above was corrected.
Summary of change:	⌘ The RNC shall indicate, within the initialisation frame, all the user plane versions it supports among those that have been requested by the CN.
Consequences if not approved:	⌘ The RNC might initialise a user plane version that do not support features negotiated OoB.

Clauses affected:	⌘ 6.4.3, 6.5.2.1, 6.6.3.1, 6.6.3.25, 8.1.4, B.2.1	
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ 25.410 CR021 Rel-4, 25.413 CR297 Rel-4
	<input type="checkbox"/> Test specifications	
	<input type="checkbox"/> 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/3G_Specs/CRs.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://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

6.4.3 Procedure Control functions

This set of functions offers the control of a number of procedures handled at the Iu UP protocol level. These functions are responsible for the procedure control part of the Iu UP frames.

Namely, these procedures are:

- **Rate Control:** is the procedure which controls over the Iu UP the maximum rate that is allowed to be sent downlink among the rates that can be controlled. The set of rates is represented by RFCI indicators. The function controlling this procedure interacts with functions outside of the Iu UP protocol layer.
- **Initialisation:** is the procedure which controls the exchange of initialisation information that is required for operation in support mode for predefined SDU size. Such information can contain the RFCI Set to be used until termination of the connection or until the next initialisation procedure. This procedure is also used for negotiating the version of the Iu UP Mode among the versions the CN requested for the related RAB.
- **Time Alignment:** is the procedure that controls the timing of the downlink data to the RNC over Iu. The function controlling this procedure interacts with functions outside of the Iu UP protocol layer.
- **Handling of Error Event:** is the procedure that controls the information exchanged over the Iu related to detection of a fault situation. The function controlling this procedure interacts with functions outside of the Iu UP protocol layer.

6.5.2 Initialisation procedure

6.5.2.1 Successful operation

This procedure is mandatory for RABs using the support mode for predefined SDU size. The purpose of the initialisation procedure is to configure both termination points of the Iu UP with the RFCIs and associated RAB Sub Flows SDU sizes necessary during the transfer of user data phase. Additional parameters may also be passed, such as the Inter PDU Timing Interval (IPTI) information.

The initialisation procedure may be controlled at both end of the Iu access point, i.e. the CN and UTRAN.

The initialisation procedure is invoked whenever indicated by the Iu UP Procedure Control function e.g. as a result of a relocation of SRNS or at RAB establishment over Iu or if the CN decides to resolve RFCI mismatch in case of TrFO (see [13]). The initialisation procedure shall not be re-invoked by the SRNC for the RAB without a RAB modification requested via RANAP [3].

When this procedure is invoked all other Iu UP procedures are suspended until termination of the initialisation procedure.

The Iu UP protocol entity invoking this procedure shall indicate the Iu UP Mode version it uses for the initialisation as well as the Iu UP Mode versions it supports for the related RAB among the versions the CN requested for the related RAB. The sender should use the lowest version for the initialisation that has enough information to initialise the highest proposed protocol version.

The invoking entity allocates a RAB sub-Flow Combination indicator (RFCI) to each RAB sub-Flow Combination it initialises. The association of indicators to RAB Flow Combinations is valid for both the uplink and downlink direction in the Iu UP until a new initialisation procedure is performed or the connection is terminated.

The procedure control function may also generate additional Iu UP protocol parameters necessary for the RAB service to operate properly over Iu.

To each RAB sub-Flow combination indicator is associated the size of each RAB sub-Flow SDU of that combination. The list of RAB sub-Flow Combination Indicators and their respective SDU sizes constitutes the RAB sub-Flow Combination set passed over the Iu UP in the initialisation frame i.e. into an appropriate Iu UP PDU Type.

The first RAB sub-Flow Combination proposed in the list of RAB sub-Flow Combination indicates the initial RAB sub-Flow Combination i.e. the first RAB sub-Flow Combination to be used when starting the communication phase i.e. the transfer of user data procedure.

The complete set of information is framed by the Iu UP Frame Handler function and transferred in an Iu UP initialisation frame. If needed, the initialisation frame CRC is calculated and set accordingly in the respective frame field.

A supervision timer T_{INIT} is started after sending the Iu UP initialisation frame. This timer supervises the reception of the initialisation acknowledgement frame.

Upon reception of a frame indicating that an initialisation control procedure is active in the peer Iu UP entity, the Iu UP protocol layer forwards the whole protocol information contained in the initialisation frame to the upper layers. It also stores the RAB sub-Flow Combination set (and thus replaces a possible previous set) in order to control during the transfer of user data, that the Iu UP payload is correctly formatted (e.g. RFCI matches the expected Iu UP frame payload total length). The peer Iu UP entity receiving the initialisation message shall choose a version that it supports, which is among a set of required versions and for which ~~the peer Iu UP entity~~ has enough initialisation information.

If the initialisation frame is correctly formatted and treated by the receiving Iu UP protocol layer, this latter sends an initialisation acknowledgement frame using the version of the Iu UP Mode that is chosen.

Upon reception of an initialisation acknowledgement frame, the Iu UP protocol layer in the SRNC stops the supervision timer T_{INIT} .

If the initialisation procedure requires that several frames are to be sent, each frame shall be acknowledged individually (i.e. any frame to be sent shall wait for the acknowledgement of the previous sent frame to be received before being sent. The supervision timer shall be used individually for each frame being sent.

The successful operation of the initialisation procedure may require that one or several chained frames are positively acknowledged. The number of initialisation frames in such a chain shall not exceed 4. Each chained frame shall be positively acknowledged before the one with the next frame number can be sent.

The frame number of an initialisation frame shall always be set to zero when the chain has only one frame. When several initialisation frames are used in a chain the frame number shall be set to zero for the first one and incremented by one in the sending direction for each new frame in the chain. The positive acknowledgement or negative acknowledgement shall carry the frame number of the frame being acknowledged.

Upon reception of an initialisation negative acknowledgement frame, an erroneous acknowledgement or at timer T_{INIT} expiry, the Iu UP protocol entity controlling the initialisation procedure shall reset and restart the T_{INIT} supervision timer and repeat one initialisation frame with the same frame number. The repetition shall be performed up to N_{INIT} times, N_{INIT} being chosen by the operator (default $N_{INIT} = 3$). The N_{INIT} (maximum number of allowed repetition) is the aggregate count for each frame in the chain and is restart each time a frame is positively acknowledged.

Consequently, when in the communication phase (as indicated by internal functions in the Radio Network layer), the frame transmission starts in downlink in the initial RFCI.

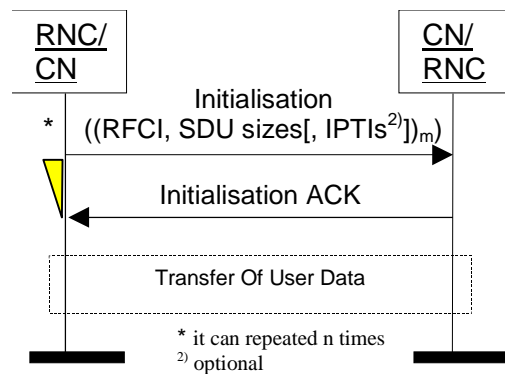


Figure 9: Successful Initialisation of Iu UP for m RFCIs

6.6.3.1 PDU Type

Description: The PDU type indicates the structure of the Iu UP frame. The field takes the value of the PDU Type it identifies: i.e. 0 for PDU Type 0. The PDU type is in bit 4 to bit 7 in the first octet of the frame. PDU type is used in all frames in support mode for predefined SDU sizes ~~version 1~~.

Value range: {0-1 and 14 in use, 2-13: reserved for future PDU types, 15=reserved for future PDU type extensions }

Field length: 4 bits

6.6.3.25 Iu UP Mode versions supported

Description: This field indicates the Iu UP Mode Versions supported by the RNC for the related RAB. Up to 16 Iu UP Mode versions can be simultaneously indicated~~available~~.

Value range:

Each bit, in the two octet field, indicates a Iu UP Protocol version: (First octet, bit 7) indicates version 16, (Second octet, bit 0) indicates version 1.

Bit = 0 means “Version not supported or not allowed”

Bit = 1 means “Version supported among the required versions”

Field length: 2 octets

8.1.4 Protocol version handling

In the future, new versions of the Iu UP protocol may be introduced. A reason for a new version of the protocol could be, e.g.:

- The earlier introduced new features or functions are required to be mandatory in the new version;
- Due to technical development, the new version of the protocol could be totally different (and incompatible) from the earlier version.

The following principles shall be applied to version handling of Iu UP protocol:

- It shall be possible to introduce additional modes of operation;
- It shall be possible to evolve the operation modes independently of each other;
- There shall be independent version numbers for each mode of operation;
- The mode of operation of an Iu UP protocol instance is decided by the CN. Further, the CN shall indicate those versions that are required to support certain features, e.g. TrFO, but ~~but~~ The version of the mode among the required ones shall be negotiated between the CN and UTRAN during initialisation procedure;
- The version number of a UP operation mode may change or be unchanged between different releases;
- When the protocol is evolved it shall be made clear in the specification, which features belong to which versions;
- A new version may be an evolution (i.e. compatible) of the old version or the new version may be totally different from the old version.
- The structure of the PDU Type 14 header, up to and including header CRC, shall remain unchanged whatever the Iu UP version.

B.2.1 Null State

In the null state the Iu UP instance does not exist and therefore it is not possible to transfer any data through it.

Upon reception of a Iu-UP-CONFIG-Req from higher layer the Iu UP instance is created and initialisation state is entered. In the Iu-UP-CONFIG-Req e.g. the following information could be indicated:

- Support mode for predefined SDU sizes;
- Time alignment (FFS);
- Indication of delivery of erroneous SDUs;
- Periodicity.
- required UP versions