3GPP TSG CN Plenary **Tdoc NP-010045**
Meeting #11, Palm Springs, U.S.A
14th - 16th March 2001

Source: **TSG_CN WG 3**

Title: **CRs to REL-4 Work Item "CSSPLIT"**

Agenda item: **8.3**

Document for: **APPROVAL**

Introduction:

This document contains **2** CRs on **REL-4** Work Item **"CSSPLIT"**, that have been agreed by **TSG_CN WG3**, and are forwarded to TSG CN Plenary meeting **#11** for approval.

Doc-2nd-Level	Spec	CR	Rev	Cat	Subject	Phase	Version-Current	Workitem
N3-010170	23.910	026		B	Introduction of Nb UP	REL-4	4.1.0	CSSPLIT
N3-010169	29.007	039		B	Introduction of Nb UP	REL-4	4.1.0	CSSPLIT

3GPP TSG CN WG3 Meeting #16 ***Tdoc N3-010169***
Sophia Antipolis, France, February-March 2001

CR-Form-v3

CHANGE REQUEST

⌘ **29.007** **CR** **039** ⌘ **rev** **-** ⌘ **Current vers** **4.1.0** ⌘

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

Title:	⌘	Introduction of Nb UP
Source:	⌘	TSG_CN WG3
Work item code:	⌘	CSSPLIT
Date:	⌘	2001-01-09
Category:	⌘	**B**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	Part of CSSPLIT
Summary of change:	⌘	Necessary changes related to BICSCN
Consequences if not approved:	⌘	CSSPLIT WI will not be complete

Clauses affected:	⌘			
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.910, 29.415, 29.414
Other comments:	⌘	29.415, 29.414 are not yet approved		

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.

[1] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[2] ITU-T Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[3] ITU-T Recommendation I.464: "Multiplexing, rate adaption and support of existing interfaces for restricted 64 kbit/s transfer capability".

[4] ITU-T Recommendation Q.922 (1992): "DSS 1 Data link layer: ISDN data link layer specification for frame mode bearer services".

[5] ITU-T Recommendation Q.931 (05/98): "DSS 1 - ISDN user network interface layer 3 specification for basic call control".

[6] ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[7] ITU-T Recommendation V.24: "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[8] ITU-T Recommendation V.25: "Automatic answering equipment and/or parallel automatic calling equipment on the general switched telephone network including procedures for disabling of echo control devices for both manually and automatically established calls".

[9] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[10] ITU-T Recommendation V.32bis: "A duplex modem operating at data signalling rates of up to 14 400 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits"

[11] ITU-T Recommendation V.34: "A modem operating at data signalling rates of up to 33 600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[12] ITU-T Recommendation V.42: "Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion".

[13] ITU-T Recommendation V.42bis: "Data Compression for Data Circuit Terminating Equipment (DCE) using Error Correction Procedures".

[14] ITU-T Recommendation V.90: "A digital modem and analogue modem pair for use on the Public Switched Telephone Network (PSTN) at data signalling rates of up to 56 000 bit/s downstream and up to 33 600 bit/s upstream".

[15] ITU-T Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[16] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[17] ETSI ETR 018: "Integrated Services Digital Network (ISDN); Application of the Bearer Capability (BC), High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) information elements by terminals supporting ISDN services".

[18] ETSI ETS 300 102-1 Edition 1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[19] ETSI EN 300 403-1 V1.2.2 (1998-04): "Integrated Services Digital Network (ISDN); Digital Sunscriber Signalling System No. One (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification".

[20] 3GPP TS 41.001: "Digital cellular telecommunication system (Phase 2+); GSM Release 1999 Specifications".

[21] 3GPP TS 41.004: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".

[22] 3GPP TS 42.001: "Digital cellular telecommunication system (Phase 2+); Principles of telecommunication services supported by a GSM Public Land Mobile Network (PLMN)".

[23] 3GPP TS 42.003: "Digital cellular telecommunications system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[24] 3GPP TR 43.010: "Digital cellular telecommunications system (Phase 2+); GSM PLMN Connection types".

[25] 3GPP TS 43.045: "Digital cellular telecommunications system (Phase 2+); Technical realization of facsimile group 3 transparent".

[26] 3GPP TS 43.050: "Digital cellular telecommunications system (Phase 2+); Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system".

[27] 3GPP TS 44.021: "Digital cellular telecommunications system (Phase 2+); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[28] 3GPP TS 48.020: "Digital cellular telecommunication system (Phase 2+); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[29] 3GPP TS 48.060: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors for Enhanced Full Rate (EFR) and full rate traffic channels".

[30] 3GPP TS 49.002 : "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[31] 3GPP TS 49.003: "Digital cellular telecommunication system (Phase 2+); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".

[32] 3GPP TS 21.101: "3rd Generation Partnership Project; Technical Specification Group: Release 1999 Specifications".

[33] 3GPP TS 22.002: " Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[34] 3GPP TS 22.004: "General on supplementary services".

[35] 3GPP TS 23.003: "Numbering, addressing and identification".

[36] 3GPP TS 23.008: "Organization of subscriber data".

[37] 3GPP TS 23.011: "Technical realization of supplementary services".

[38] 3GPP TS 23.146: "Technical realization of facsimile group 3 non-transparent".

[39] 3GPP TS 23.054: "Description for the use of a Shared Inter Working Function in a GSM PLMN; Stage 2".

[40] 3GPP TS 24.008: "Mobile radio interface layer 3 specification".

[41] 3GPP TS 24.022: "Radio Link Protocol (RLP) for data and telematic services on the Mobile Station - Base Station System (MS - BSS) interface and the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[42] 3GPP TS 25.415: "Iu Interface CN-UTRAN User Plane Protocols".

[43] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[44] 3GPP TS 27.002: "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[45] 3GPP TS 27.003: "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[46] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[47] 3GPP TS 29.006: "Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services".

[48] ISO/IEC 3309: "Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures - Frame structure".

[49] IETF RFC 1662: "PPP in HDLC-like framing".

[50] Mobile Internet Access Forum: "PIAFS Specification Ver. 1.1, 2.1".

[51] ITU-T Recommendation V.8: "Procedures for starting sessions of data transmission over the public switched telephone network".

[52] TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[53] 3GPP TR 23.910: " Circuit Switched Data Bearer Services".

[54] ITU-T Recommendation H.223: "Multiplexing protocol for low bit rate multimedia communication".

[55] ITU-T Recommendation H.223, Annex A: "Multiplexing protocol for low bit rate multimedia communication over low error-prone channels".

[56] ITU-T Recommendation H.223, Annex B: "Multiplexing protocol for low bit rate multimedia communication over moderate error-prone channels".

[57] ITU-T Recommendation H.223, Annex C: "Multiplexing protocol for low bit rate multimedia communication over highly error-prone channels".

[58] ITU-T Recommendation H.324: "Terminal for low bit-rate multimedia communication".

[59] 3GPP TS 29.415: "Core Network Nb Interface User Plane Protocols"

[60] ITU-T I.366.2: "AAL type 2 service specific convergence sublayer for trunking".

[61] 3GPP TS 29.232: "Media Gateway Controller; Media Gateway interface; Stage 3"

11.3 Handover within 3G PLMNs

After a handover from a 3G MSC to another 3G MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to:

- the Iu UP protocol if both MSC-s are connected via an ATM interface;

- the A-TRAU' protocol if both MSC are connected via a TDM interface except for the transparent case FNUR = 32 kbit/s (ITC = UDI or RDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T I.460 [2].

- the Nb UP protocol if both MGWs are connected via an ATM interface or IP interface

11.5 Transport within the Core Network

The Nb UP protocol is used to transport user data in the Core Network, see [59] 3GPP TS 29.415. Figure xx below shows different cases to consider:

1. Transport on the access side of the IWF
2. Transport beyond the IWF, i.e., between the IWF and the fixed network

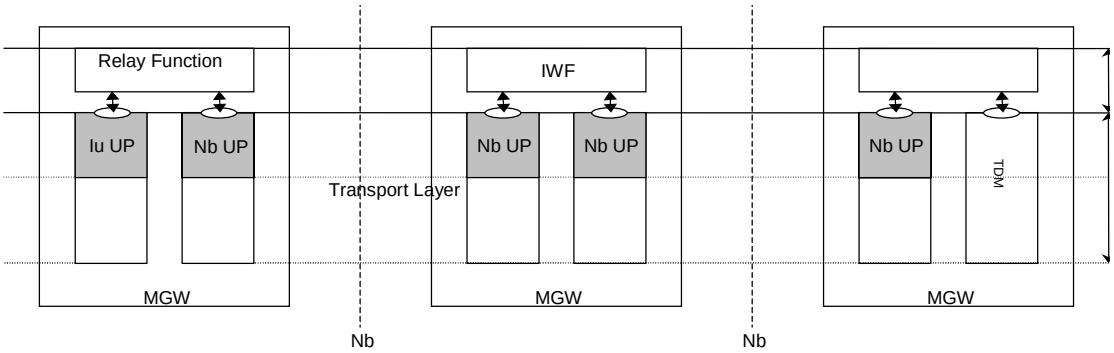

Figure xx: Transport of data within the Core Network

11.5.1 Transport on the access side of the IWF

This section is applicable in cases where the IWF is not interfacing an Iu UP layer protocol entity, as a result of, e.g., at handover.

11.5.1.1 Non-transparent case

The Nb UP is used in support mode. The same SDU sizes and transmission intervals that are used on the Iu interface are used over the Nb interface, see [53] 3GPP TR 29.310 and [43] 3GPP TS 27.001. A Relay Function (see [61] 3GPP TS 29.232) is used to relay the user data and control information (such as rate control) in MGWs between the MGW where the IWF is residing and the Iu interface.

11.5.1.2 Transparent case

The Nb UP is used in transparent mode. The same SDU sizes and transmission intervals that are used on the Iu interface are used over the Nb interface, see [53] 3GPP TR 29.310 and [43] 3GPP TS 27.001. The PDUs are passed unmodified through all MGWs between the MGW where the IWF is residing and the Iu interface.

Note: Transmission in case of user rate 33.6 kbit/s is FFS.

11.5.2 Transport beyond the IWF

11.5.2.1 UDI and RDI

The data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of [60] ITU-T I.366.2. PDU type 0 is used, i.e., payload CRC is applied.

At the border between the CN and the fixed (ISDN) network, conversion between Nb UP and TDM shall be applied. In case of RDI interworking, the 56 kbit/s RDI bit stream is transmitted within the CN as 64 kbit/s bit stream where the

last bit of each octet is ignored. For this reason the octet alignment shall be preserved in the SDUs transported in the CN.

11.5.2.2 Modem

The modem signals are PCM encoded and transported on a 64 kbit/s bit stream. The transmission is otherwise identical to the UDI/RDI case, see Section 11.5.2.1

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Sophia Antipolis, March 2001

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CHANGE REQUEST

⌘ **23.910** **CR** **026** ⌘ **rev** **-** ⌘ **Current vers** **4.1.0** ⌘

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Clauses affected:	⌘	5.1, 6, 6.1, 6.2, 10.2.3		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.007, 29.415, 29.414
Other comments:	⌘	29.415, 29.414 are not yet approved		

5.1 Bearer Capabilities for UMTS Data Services~~UMTS Bearer Services in Release 99~~

6 Iu and Nb User Plane

6.1 NT services

On the Iu interface and on the Nb interfaces between the access network and the IWF, ~~T~~the Iu and Nb user plane ~~is~~ are used in support mode, see 3GPP TS 25.415 and 3GPP TS 29.415. Each SDU corresponds to one RLP frame and, consequently, is 576 bits long. Each SDU is transported in one Iu or Nb UP PDU of Type 1. The range of AIUR values is 14,4, 28,8, 57,6, limited by the maximum bit rate, and varies with the transmission period on the Uu interface, which is 10 ms, 20 ms or 40 ms~~. The Iu UP signals to the CN when the transmission period changes~~. A change in the transmission period is signalled to the IWF through the Iu and Nb UP protocols. The Iu or Nb UP primitive Iu- or Nb-UP-DATA-REQUEST is invoked each time an RLP frame is ready to be sent from the ~~CN~~ IWF towards the UE. DTX indication is not used.

If TDM is not used, then between the IWF and the fixed network (ISDN or PSTN), the Nb UP protocol is applied in support mode and the SDU size is 320 bits, transmitted every 5 ms. PDU type 0 is used.

6.2 T services

The Iu UP and Nb UP are~~is~~ used in transparent mode, see 3GPP TS 25.415 and 3GPP TS 29.415. The payload of the Iu and Nb frames will consist of user data bits only.

On the Iu and Nb interfaces, ~~T~~the payload (SDU) size is fixed, determined by the bit rate. Following table shows SDU size defined by GSM Association - IMT-2000 Steering Group (Typical Radio Interface Parameter Sets). AAL2 is used. The AAL2 SSCS layer must be supported for segmentation and re-assembly.

Bit rate	SDU size (= RLC PDU payload size)
28.8 kbit/s	576 bits
33.6 kbit/s	[Editor's note] Waiting for decision by GSM Association
32 kbit/s	640 bits
56/64 kbit/s	640 bits

The primitive Iu- or Nb-UP_UNIT-DATA-REQUEST is invoked at regular intervals in order to have a constant bit rate (every SDU).

If TDM is not used, then between the IWF and the fixed network (ISDN or PSTN), the Nb UP protocol is applied in support mode and the SDU size is 320 bits, transmitted every 5 ms. PDU type 0 is used.

10.2.3 Handover within 3G PLMNs

After a handover from a 3G MSC to another 3G MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to

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- the Nb UP protocol if both MGWs are connected via an ATM interface or IP interface