TSG RAN Meeting #23 **RP-040133**
Phoenix, Arizona, USA, 10 - 12 March 2004

Title **IP-ATM Compromise Proposal**
Source **TSG RAN WG3**
Agenda Item **7.4.2**

RAN3 Tdoc	CR.	Rev.	Cat	Spec.	curr. Vers.	new Vers.	REL	Work Item	Title
R3-04xxxx	(82)	2	F	25.401	5.7.0	5.8.0	REL-5	ETRAN-IPtrans	Completion of the Rel-5 IP transport WI by removing the 3rd IP-ATM interworking option
R3-04xxxx	(76)	2	F	25.414	5.5.0	5.6.0	REL-5	ETRAN-IPtrans	Completion of the Rel-5 IP transport WI by removing the 3rd IP-ATM interworking option

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CHANGE REQUEST

⌘ **25.401** **CR** **(082)** ⌘ **rev** **2** ⌘ Current version: **5.7.0** ⌘

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

Title:	⌘	Completion of the Rel-5 IP transport WI by removing the 3rd IP-ATM interworking option
Source:	⌘	RAN3
Work item code:	⌘	ETRAN-iptrans
Date:	⌘	11/03/2004
Category:	⌘	**F**
Release:	⌘	Rel-5

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:	⌘	To close the final open issue in Rel-5 WI on IP transport in UTRAN
Summary of change:	⌘	The 3rd IP-ATM interworking option is removed from the Specifications while the other two interworking options remain. Rev1: - Impact on functional and protocol - Change refined in 11.1.3.3 Rev2: - IP-ALCAP mentioned as an example of the implementation of alternative 2 Impact Analysis Impact assessment towards the previous version of the specification (same release): this CR has isolated impact on the previous version of the specification (same release) because only one optional function is impacted. This CR has an impact under functional and protocol point of view. The impact can be considered as isolated as it affects only the IP-ATM Interworking function.
Consequences if not approved:	⌘	If this CR is not approved, the last remaining open issue in Rel-5 WI on IP transport in UTRAN remains open.

Clauses affected:	⌘	2, 11.1.3.3			
Other specs	⌘	Y: X / N:	Other core specifications	⌘	CR083 25.401 Rel-6 CR050 25.410 Rel-5 CR051 25.410 Rel-6

			CR076 25.414 Rel-5 CR077 25.414 Rel-6 CR038 25.420 Rel-5 CR039 25.420 Rel-6 CR039 25.426 Rel-5 CR040 25.426 Rel-6 CR047 25.430 Rel-5 CR048 25.430 Rel-6
affected:		**X**	Test specifications
		X	O&M Specifications

Other comments: ⌘ This is a draft CR

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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[1] 3GPP TR 25.990: "Vocabulary".

[2] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[3] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[4] 3GPP TS 25.442: "UTRAN Implementation Specific O&M Transport".

[5] 3GPP TS 25.402: "Synchronisation in UTRAN, Stage 2".

[6] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[7] 3GPP TS 25.331: "RRC Protocol Specification".

[8] 3GPP TS 23.101: "General UMTS Architecture".

[9] 3GPP TS 25.414: " UTRAN Iu Interface Data Transport & Transport Signalling".

[10] 3GPP TS 25.424: "UTRAN Iur Interface Data Transport & Transport Signalling for Common Transport Channel Data Streams".

[11] 3GPP TS 25.434: "UTRAN Iub Interface Data Transport & Transport Signalling for Common Transport Channel Data Streams".

[12] IETF RFC 2460: "Internet Protocol, Version 6 (Ipv6) Specification".

[13] IETF RFC 2474: "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers " December 1998

[14] IETF RFC 768: "User Datagram Protocol", (8/1980)

[15] "Information technology – Open Systems Interconnection – Network service definition", X.213, ISO/IEC 8348.

[16] "Information technology – Open Systems Interconnection – Network service definition Amendment 1: Addition of the Internet protocol address format identifier", X.213/Amd.1, ISO/IEC 8348.

[17] IETF RFC 791 (1981): "Internet Protocol".

[18] 3GPP TS 25.426: "UTRAN Iur and Iub Interface Data Transport & Transport Signalling for DCH Data Streams".

[19] ~~TBD.~~ ITU-T Recommendation Q.2631.1 (10/2003): “IP Connection Control Protocol – Capability Set 1”

[20] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".

[21] 3GPP TR 43.930: "Iur-g interface; Stage 2".

< Unaffected parts omitted >

11.1.3 Vertical Planes

11.1.3.1 Control Plane

The Control Plane Includes the Application Protocol, i.e. RANAP, RNSAP or NBAP, and the Signalling Bearer for transporting the Application Protocol messages.

Among other things, the Application Protocol is used for setting up bearers for (i.e. Radio Access Bearer or Radio Link) in the Radio Network Layer. In the three plane structure the bearer parameters in the Application Protocol are not directly tied to the User Plane technology, but are rather general bearer parameters.

The Signalling Bearer for the Application Protocol may or may not be of the same type as the Signalling Protocol for the ALCAP. The Signalling Bearer is always set up by O&M actions.

11.1.3.2 User Plane

The User Plane Includes the Data Stream(s) and the Data Bearer(s) for the Data Stream(s). The Data Stream(s) is/are characterised by one or more frame protocols specified for that interface.

11.1.3.3 Transport Network Control Plane

The Transport Network Control Plane does not include any Radio Network Layer information, and is completely in the Transport Layer. It includes the ALCAP protocol(s) that is/are needed to set up the transport bearers (Data Bearer) for the User Plane. It also includes the appropriate Signalling Bearer(s) needed for the ALCAP protocol(s).

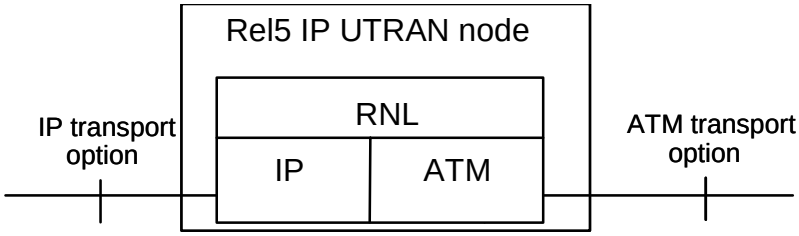
The Transport Network Control Plane is a plane that acts between the Control Plane and the User Plane. The introduction of Transport Network Control Plane is performed in a way that the Application Protocol in the Radio Network Control Plane is kept completely independent of the technology selected for Data Bearer in the User Plane. Indeed, the decision to actually use an ALCAP protocol is completely kept within the Transport Network Layer.

It should be noted that ALCAP might not be used for all types Data Bearers. If there is no ALCAP signalling transaction, the Transport Network Control Plane is not needed at all. This is the case when pre-configured Data Bearers are used or when the IP UTRAN option is used between two IP UTRAN nodes or between an IP UTRAN node and an IP CN node.

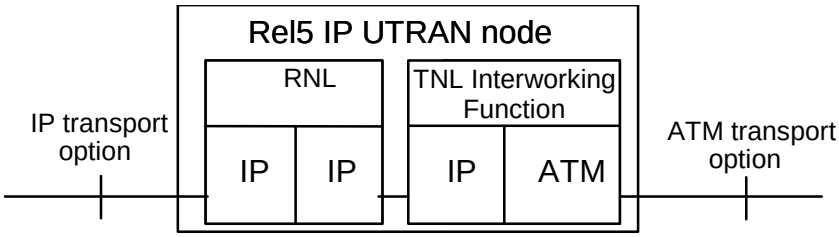
When Transport Network Control Plane is used, the transport bearers for the Data Bearer in the User Plane are set up in the following fashion. First there is a signalling transaction by the Application Protocol in the Control Plane, which triggers the set up of the Data Bearer by the ALCAP protocol that is specific for the User Plane technology.

~~For interworking of an IP UTRAN node with another UTRAN node using only the ATM transport option, an IP ALCAP protocol may be supported depending on the interworking solution selected:~~ The following interworking alternatives are specified for the IP-ATM interworking:

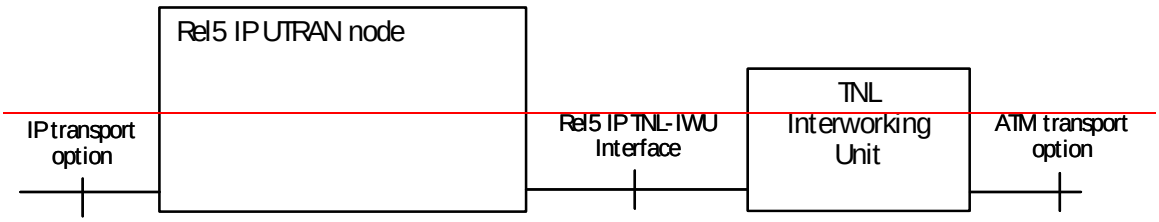
1) ATM/IP Dual Stack supported in the IP UTRAN node. When an ATM/IP dual stack is implemented in the IP UTRAN node, support of an IP ALCAP protocol is not required.



2) Use of an interworking function (IWF) as logical part of the IP UTRAN node. When the IWF is implemented in the IP UTRAN node, support of an IP ALCAP protocol is not required. However, one possible implementation scenario is to apply IP-ALCAP protocol [19] between the UTRAN Node and its IWF.



~~3) Use of an interworking unit (IWU) as a separate logical unit. When a separate logical IWU is used to perform the interworking, [19] shall be used as the signalling protocol to control the establishment of the connections between the IP UTRAN node and this IWU.~~



~~It should also be noted that the ALCAP protocol(s) in the Transport Network Control Plane is/are not used for setting up the Signalling Bearer for the Application Protocol or for the ALCAP during real time operation.~~

~~The Signalling Bearer for the ALCAP may or may not be of the same type as the Signalling Bearer for the Application Protocol. The Signalling Bearer for ALCAP is always set up by O&M actions.~~

11.1.3.4 Transport Network User Plane

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CHANGE REQUEST

⌘ **25.414** **CR** **(076)** ⌘ **rev** **2** ⌘ Current version: **5.5.0** ⌘

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Clauses affected:	⌘	2, 5.3.2, 5.3.3			
Other specs	⌘	**Y** / **N**: **X** /	Other core specifications	⌘	CR082 25.401 Rel-5 CR083 25.401 Rel-6 CR050 25.410 Rel-5

			CR051 25.410 Rel-6 CR077 25.414 Rel-6 CR038 25.420 Rel-5 CR039 25.420 Rel-6 CR039 25.426 Rel-5 CR040 25.426 Rel-6 CR047 25.430 Rel-5 CR048 25.430 Rel-6
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[1] ITU-T Recommendation I.361 (11/95): "B-ISDN ATM layer specification".

[2] ITU-T Recommendation I.363.2 (11/00): "B-ISDN ATM Adaptation layer specification: Type 2 AAL".

[3] ITU-T Recommendation I.363.5 (8/96): "B-ISDN ATM Adaptation layer specification: Type 5 AAL".

[4] ITU-T Recommendation I.366.1 (6/98): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL type 2".

[5] ITU-T Recommendation E.164 (5/97): "The international public telecommunication numbering plan".

[6] ITU-T Recommendation Q.2110 (7/94): "B-ISDN ATM adaptation layer - Service Specific Connection Oriented Protocol (SSCOP)".

[7] ITU-T Recommendation Q.2140 (2/95): "B-ISDN ATM adaptation layer - Service Specific Coordination Function for Support of Signalling at the Network Node Interface (SSCF-NNI)".

[8] ITU-T Recommendation Q.2150.1 (12/99): "AAL type 2 signalling transport converter on broadband MTP".

[9] ITU-T Recommendation Q.2210 (7/96): "Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140".

[10] ITU-T Recommendation Q.2630.1 (12/99): "AAL type 2 signalling protocol (Capability Set 1)".

[11] ITU-T Recommendation X.213 (11/95): "Information technology - Open systems interconnection - Network Service Definitions".

[12] IETF RFC 768 (Auguest 1980): "User Datagram Protocol".

[13] IETF RFC 791 (September 1981): "Internet Protocol".

[14] IETF RFC 2684 (September 1999): "Multiprotocol Encapsulation over ATM Adaptation Layer 5".

[15] IETF RFC 2225 (April 1998): "Classical IP and ARP over ATM".

[16] IETF RFC 2460 (December 1998): "Internet Protocol, Version 6 (IPv6) Specification".

[17] 3GPP TS 29.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[18] IETF RFC 793 (September 1981): "Transmission Control Protocol".

[19] IETF RFC 2474 (December 1998): "Definition of the Differentiated Services Field (DS Field) in the Ipv4 and Ipv6 Headers".

[20] ITU-T Implementor's guide (12/99) for recommendation Q.2210 (07/96).

[21] ITU-T Recommendation Q.2630.2 (12/00): "AAL type 2 signalling protocol (Capability Set 2)".

[22] IETF RFC 1889 (January 1996): "RTP: A Transport Protocol for Real Time Applications".

[23] IETF RFC 1890 (January 1996): "RTP Profile for Audio and Video Conferences with Minimal Control".

[24] 3G TS 25.415: "UTRAN Iu Interface User Plane Protocols"

[25] IETF RFC 1661 (July 1994): "The Point-to-Point Protocol (PPP)".

[26] IETF RFC 1662 (July 1994): "PPP in HDLC-like Framing".

[27] IETF RFC 2507 (February 1999): "IP header compression".

[28] IETF RFC 1990 (August 1996): "The PPP Multilink Protocol (MP)".

[29] IETF RFC 2686 (September 1996): "The Multi-Class Extension to Multi-Link PPP".

[30] IETF RFC 2509 (February 1999): "IP Header Compression over PPP".

[31] ~~"IP-ALCAP" [ffs.]~~ITU-T Recommendation Q.2631.1 (10/2003): “IP Connection Control Protocol – Capability Set 1”

[32] IETF RFC 3153 (August 2001): "PPP Multiplexing".

[33] IETF RFC 2364 (July 1998): "PPP over AAL5".

[34] IETF RFC 3031 (January 2001): "Multiprotocol Label Switching Architecture".

[35] ITU-T Recommendation E.191 (03/00): "B-ISDN addressing".

<Unaffected parts omitted>

5.3 Interworking between ATM and IP Transport Options

5.3.1 Introduction

This clause specifies the interworking between IP and ATM transport options. An RNC/CN-node supporting IP transport option shall provide interworking to a CN-node/RNC supporting only ATM transport option.

5.3.2 Interworking Alternatives

For interworking with a CN-node/RNC supporting only ATM transport option, the RNC/CN-node supporting IP transport option shall additionally support at least one of the following interworking mechanisms:

1) ATM&IP dual stack. An IP-ALCAP protocol is not required in this interworking solution.

2) Interworking Function (IWF) as a logical part of the ~~RNC~~RAN/CN-node supporting IP transport option. An IP-ALCAP protocol is not required in this interworking solution. However, one possible implementation scenario is to apply IP-ALCAP protocol [31] between the UTRAN Node and its IWF.

3) Interworking Unit (IWU) as a logically separate unit. An IP-ALCAP protocol shall be used in the interface between the RNC/CN node supporting IP transport option and the Interworking Unit.

5.3.3 IP-ALCAP for the Interworking

In the third interworking alternative as introduced in subclause 5.3.2, [31] is used as the IP-ALCAP protocol between the RNC/CN node supporting IP transport option and the Transport Network Layer Interworking Unit.

The following figure shows the protocol stack for IP-ALCAP over Iu-CS in the third interworking alternative as introduced in subclause 5.3.2.

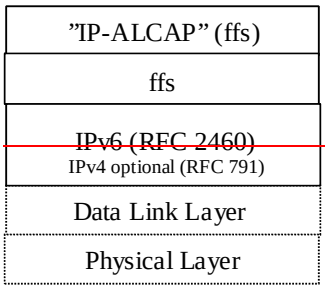

Figure 2a. Signalling bearer for IP-ALCAP.

6 Packet switched domain