TSGRP#7(00)0082

TSG-RAN Meeting #7 Madrid, Spain, 13 - 15 March 2000

Title: Agreed CRs to TS 25.414

Source: TSG-RAN WG3

Agenda item: 6.4.3

Tdoc_Num	Specification	CR_Num	Revision_Num	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Num
R3-000394	25.414	001	1	Extension with Service Area Broadcast Protocol	В	agreed	3.2.0	3.3.0
R3-000146	25.414	003		Removal of ATM Protection Switching	С	agreed	3.2.0	3.3.0
R3-000356	25.414	004		Clarification to the use of SSSAR (ITU-T I.366.1)	С	agreed	3.2.0	3.3.0
R3-000633	25.414	007		IPv6 support as optional in Iu and Gn	F	agreed	3.2.0	3.3.0
R3-000634	25.414	002	1	Correction and clarification of IP over ATM in 25.414, rev 1	F	agreed	3.2.0	3.3.0
R3-000635	25.414	008		Clarification of Multi protocol encapsulation	F	agreed	3.2.0	3.3.0
R3-000636	25.414	009		Removal of UDP port description in 25.414	F	agreed	3.2.0	3.3.0
R3-000856	25.414	013	1	Quality of Service differentiation	F	agreed	3.2.0	3.3.0

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R3-000971	25.414	011	1	Clarification of using IP over ATM	F	agreed	3.2.0	3.3.0
R3-000899	25.414	006	1	Formal cleanup of 25.414	F	agreed	3.2.0	3.3.0

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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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]	ITU-T Recommendation I.361 (2/1999): "B-ISDN ATM Layer Specification".
[2]	ITU-T Recommendation I.363.2 (9/1997): "B-ISDN ATM Adaptation Layer Type 2 Specification".
[3]	ITU-T Recommendation I.363.5 (8/1996): "B-ISDN ATM Adaptation Layer Type 5 Specification".
[4]	ITU-T Recommendation I.366.1 (6/1998): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL Type 2".
[5]	ITU-T Recommendation E.164 (5/1997): "Numbering Plan for the ISDN Era".
[6]	ITU-T Recommendation Q.2110 (7/1994): "B-ISDN ATM Adaptation Layer-Service Specific Connection Oriented Protocol (SSCOP)".
[7]	ITU-T Recommendation Q.2140 (2/1995): "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 (1999): "B-ISDN ATM Adaptation Layer-Signalling Transport Converter for the MTP3b".
[9]	ITU-T Recommendation Q.2210 (7/1996): "Message Transfer Part level 3 functions and messages using the services of ITU-T Recommendation Q.2140".
[10]	ITU-T Recommendation Q.2630.1 (1999): "AAL type 2 Signalling Protocol (Capability Set 1)".
[11]	ITU-T Recommendation X.213 (8/1997): "Information Technology-Open Systems Interconnection-Network Service Definitions".
[12]	IETF RFC 768 (8/1980): "User Datagram Protocol".
[13]	IETF RFC 791 (9/1981): "Internet Protocol".
[14]	IETF RFC 1483 (7/1993): "Multiprotocol Encapsulation over ATM Adaptation Layer 5".
[15]	IETF RFC 2225 (4/1998): "Classical IP and ARP over ATM".
[16]	IETF RFC 2460 (12/1998): "Internet Protocol, Version 6 (IPv6) Specification".
[17]	3G TS 29.060: "3GPP; TSG CN; GPRS; GPRS Tunnelling Protocol (GTP)".
[18]	ITU T Rec. I.630 (2/99): "ATM Protection Switching".

4.1 General

ATM shall be used in the transport network user plane and the transport network control plane according to I.3610.

4.2 Protection Switching at ATM Layer

If redundancy of pathways at ATM layer between CN and RNC is supported, it shall be implemented using ATM Protection Switching according to 1.630 [18].

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5.1.2.1 AAL2-Segmentation and Reassembly Service Specific Convergence Sublayer (I.366.1)

Service Specific Segmentation and Reassembly (SSSAR) sublayer of I.366.1 [4] is used for the segmentation and reassembly of AAL2 SDUs (i.e., only SSSAR is used from I.366.1). AAL2 segmentation and reassembly shall be used according to I.366.1 [4].

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5.1.2.2 AAL2-specification (I.363.2)

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1 marine								

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.
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- [1] ITU-T Recommendation I.361 (2/1999): "B-ISDN ATM Layer Specification".
- [2] ITU-T Recommendation I.363.2 (9/1997): "B-ISDN ATM Adaptation Layer Type 2 Specification".
- [3] ITU-T Recommendation I.363.5 (8/1996): "B-ISDN ATM Adaptation Layer Type 5 Specification".
- [4] ITU-T Recommendation I.366.1 (6/1998): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL Type 2".
- [5] ITU-T Recommendation E.164 (5/1997): "Numbering Plan for the ISDN Era".
- [6] ITU-T Recommendation Q.2110 (7/1994): "B-ISDN ATM Adaptation Layer-Service Specific Connection Oriented Protocol (SSCOP)".
- [7] ITU-T Recommendation Q.2140 (2/1995): "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 (1999): "B-ISDN ATM Adaptation Layer-Signalling Transport Converter for the MTP3b".
- [9] ITU-T Recommendation Q.2210 (7/1996): "Message Transfer Part level 3 functions and messages using the services of ITU-T Recommendation Q.2140".
- [10] ITU-T Recommendation Q.2630.1 (1999): "AAL type 2 Signalling Protocol (Capability Set 1)".
- [11] ITU-T Recommendation X.213 (8/1997): "Information Technology-Open Systems Interconnection-Network Service Definitions".
- [12] IETF RFC 768 (8/1980): "User Datagram Protocol".
- [13] IETF RFC 791 (9/1981): "Internet Protocol".
- [14] IETF RFC 1483 (7/1993): "Multiprotocol Encapsulation over ATM Adaptation Layer 5".
- [15] IETF RFC 2225 (4/1998): "Classical IP and ARP over ATM".
- [16] IETF RFC 2460 (12/1998): "Internet Protocol, Version 6 (IPv6) Specification".
- [17] 3G TS 29.060: "3GPP; TSG CN; GPRS; GPRS Tunnelling Protocol (GTP)".
- [18] ITU-T Rec. **I.630** (2/99): "ATM Protection Switching".

[19] IETF RFC 793 (9/1981): "TCP, Transmission Control Protocol"

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAL	ATM Adaptation Layer
AESA	ATM End System Address
ALCAP	Access Link Control Application Part
ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
SA	Service Area
SABP	Service Area Broadcast Protocol
SABS	Service Area Broadcast Service
RFC	Request For Comment
CN	Core Network
GTP	GPRS Tunnelling Protocol
IP	Internet Protocol
MTP3b	Message Transfer Part level 3 for Q.2140
NSAP	Network Service Access Point
PDU	Protocol Data Unit
RNC	Radio Network Controller
SAR	Segmentation and Reassembly
SCCF-NNI	Service Specific Coordination Function-Network Node Interface
SSCOP	Service Specific Connection Oriented Protocol
SSCS	Service Specific Convergence Sublayer
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
VC	Virtual Circuit

7 Broadcast Domain

7.1 Transport network user plane

7.1.1 General

The following figure shows the protocol stack for the transport network user plane on the Iu interface towards the Broadcast domain.

TCP
IP
AAL5
ATM

The protocol architecture for the Service Area Broadcast Plane of the Iu interface shall be TCP over IP over AAL5 over ATM.

7.1.2 TCP /IP

The path protocol used shall be TCP, which is specified in RFC793. Both the Ipv4.0 and Ipv6.0 protocols shall be supported which are specified in RFC791 (IPv4.0) or RFC2460 (IPv6.0)

7.1.3 ATM Adaptation Layer Type 5 (I.363.5)

AAL5 shall be used according to I.363.5.

AAL5 virtual circuits are used to transport the IP packets across the Iu interface toward the packet switched domain. Multiple VCs can be used over the interface. There is a one-to-one relationship between the VC and the IP address as required by Classical IP over ATM. An association must be made between a peer node's IP address and a VC. This association can be made using O&M or using ATM Inverse ARP according to Classical IP over ATM when PVCs are used.

7.1.4 IP/ATM

<u>Classical IP over ATM protocols are used to carry the IP packets over the ATM transport network when PVCs are</u> used. Classical IP over ATM is specified in IETF RFC 2225. Multiprotocol Encapsulation over AAL5 is specified in IETF RFC 1483.

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The path protocol used shall be UDP [12], which is specified in RFC 768. Both the IPv4 [13] (RFC 791) and IPv6 0 IP protocols shall be supported, IPv6 [16] (RFC 2460) support is optional. which are specified in RFC 791 (IPv4) or RFC 2460 (IPv6).

The IP addresses for the CN and RNC nodes are exchanged using RANAP signalling. The packet processing function in the CN sends downstream packets to the RNC IP address received in the RANAP signalling. The packet processing function in the RNC sends upstream packets to the CN IP address received in the RANAP signalling.

The GTP UDP port number as defined in GTP[17] is used for the destination port for GTP-U control messages and T-PDUs. The sending node locally allocates the UDP source port number. For GTP-U control messages, the UDP destination port is the value of the UDP source port of the corresponding GTP-U control message. The UDP source port is the value of the UDP destination port of the corresponding GTP-U control message.

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	 Clarifying text of the use of IP addresses and VCs to make and unambiguous 	the specification clearer
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6.1 Transport network user plane

6.1.1 General

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The following figure shows the protocol stack for the transport network user plane on the Iu interface towards the packet switched domain.

GTP-U
UDP
IP
AAL5
ATM

The protocol architecture for the User Plane of the Iu interface towards the packet switched domain shall be GTP-U over UDP over IP over AAL5 over ATM. One or several AAL5/ATM permanent VC's may be used as the common layer 2 resources between the UTRAN and the packet switched domain of the CN.

One switched VC may be used per user flow. The standardisation of the procedures and protocols for use of Switched VC is outside the scope of 3GPP.

Congestion control shall be performed over the Iu user plane toward the packet switched domain using buffer management and no flow control.

6.1.2 GTP-U

The GTP-U protocol shall be used over the Iu interface toward the packet switched domain.

6.1.3 UDP /IP

The path protocol used shall be UDP, which is specified in RFC 768. Both the IPv4 and IP protocols shall be supported which are specified in RFC 791 (IPv4) or RFC 2460 (IPv6).

The IP addresses for the CN and RNC nodes are exchanged using RANAP signalling. There may be one or several IP addresses in the RNC and in the CN. The packet processing function in the CN sends downstream packets of a given RAB to the RNC IP address (received in the RANAP) signalling associated to that particular RAB. The packet processing function in the RNC sends upstream packets of a given RAB to the CN IP address (received in the RANAP) signalling associated to that particular RAB.

The GTP UDP port number as defined in GTP[17] is used for the destination port for GTP-U control messages and T-PDUs. The sending node locally allocates the UDP source port number. For GTP-U control messages, the UDP destination port is the value of the UDP source port of the corresponding GTP-U control message. The UDP source port is the value of the UDP destination port of the corresponding GTP-U control message.

6.1.4 ATM Adaptation Layer Type 5 (I.363.5)

AAL5 shall be used according to I.363.5.

AAL5 virtual circuits are used to transport the IP packets across the Iu interface toward the packet switched domain. Multiple VCs can be used over the interface. There is a one-to-one relationship between the VC and the IP address as required by Classical IP over ATM. An association must be made between a peer node's IP address and a VC An association must shall be made between a VC and the IP addresses that are related to this VC in the peer node side. This association can be made using O&M or using ATM Inverse ARP according to Classical IP over ATM when PVCs are used.

6.1.5 IP/ATM

Classical IP over ATM protocols are used to carry the IP packets over the ATM transport network when PVCs are used. Classical IP over ATM is specified in IETF RFC 2225. Multiprotocol Encapsulation over AAL5 is specified in IETF RFC 1483.

6.2 Transport network control plane

ALCAP is not required over the Iu interface towards the packet switched domain.

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<u>Other</u> comments:



BSS test specifications

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Classical IP over ATM protocols and Multiprotocol Encapsulation over AAL5 are used to carry the IP packets over the ATM transport network when PVCs are used. Classical IP over ATM is specified in IETF RFC 2225 [15]. Multiprotocol Encapsulation over AAL5 is specified in IETF RFC 1483 [14].

Sophia, France, 28 Feb – 3 March 2000											
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6.1.3 UDP /IP

The path protocol used shall be UDP [12], which is specified in RFC 768. Both the IPv4 [13] and IPv6 [16] IP protocols shall be supported which are specified in RFC 791 (IPv4) or RFC 2460 (IPv6).

The IP addresses for the CN and RNC nodes are exchanged using RANAP signalling. The packet processing function in the CN sends downstream packets to the RNC IP address received in the RANAP signalling. The packet processing function in the RNC sends upstream packets to the CN IP address received in the RANAP signalling.

The GTP UDP port number as defined in GTP[17] is used for the destination port for GTP U control messages and T-PDUs. The sending node locally allocates the UDP source port number. For GTP U control messages, the UDP destination port is the value of the UDP source port of the corresponding GTP U control message. The UDP source port is the value of the UDP destination port of the corresponding GTP U control message.

Document R3-000856 e.g. for 3GPP use the format TP-99xxx or for SMG, use the format P-99-xxx

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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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]	ITU-T Recommendation I.361 (2/1999): "B-ISDN ATM Layer Specification".
[2]	ITU-T Recommendation I.363.2 (9/1997): "B-ISDN ATM Adaptation Layer Type 2 Specification".
[3]	ITU-T Recommendation I.363.5 (8/1996): "B-ISDN ATM Adaptation Layer Type 5 Specification".
[4]	ITU-T Recommendation I.366.1 (6/1998): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL Type 2".
[5]	ITU-T Recommendation E.164 (5/1997): "Numbering Plan for the ISDN Era".
[6]	ITU-T Recommendation Q.2110 (7/1994): "B-ISDN ATM Adaptation Layer-Service Specific Connection Oriented Protocol (SSCOP)".
[7]	ITU-T Recommendation Q.2140 (2/1995): "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 (1999): "B-ISDN ATM Adaptation Layer-Signalling Transport Converter for the MTP3b".
[9]	ITU-T Recommendation Q.2210 (7/1996): "Message Transfer Part level 3 functions and messages using the services of ITU-T Recommendation Q.2140".
[10]	ITU-T Recommendation Q.2630.1 (1999): "AAL type 2 Signalling Protocol (Capability Set 1)".
[11]	ITU-T Recommendation X.213 (8/1997): "Information Technology-Open Systems Interconnection-Network Service Definitions".
[12]	IETF RFC 768 (8/1980): "User Datagram Protocol".
[13]	IETF RFC 791 (9/1981): "Internet Protocol".
[14]	IETF RFC 1483 (7/1993): "Multiprotocol Encapsulation over ATM Adaptation Layer 5".
[15]	IETF RFC 2225 (4/1998): "Classical IP and ARP over ATM".
[16]	IETF RFC 2460 (12/1998): "Internet Protocol, Version 6 (IPv6) Specification".
[17]	3G TS 29.060: "3GPP; TSG CN; GPRS; GPRS Tunnelling Protocol (GTP)".
[18]	ITU-T Rec. I.630 (2/99): "ATM Protection Switching".
[19]	IETF RFC 2475 (12/1998): "An Architecture for Differentiated Services".

6.1.4 ATM Adaptation Layer Type 5 (I.363.5)

AAL5 shall be used according to I.363.5 0.

AAL5 virtual circuits are used to transport the IP packets across the Iu interface toward the packet switched domain. Multiple VCs can be used over the interface. There is a one-to-one relationship between the VC and the IP address as required by Classical IP over ATM. An association must be made between a peer node's IP address and a VC. This association can be made using O&M or using ATM Inverse ARP according to Classical IP over ATM when PVCs are used.

When PVCs are used, quality of service differentiation shall only be performed at the IP layer using differentiated services [19].

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Document R3-000899



6 Packet switched domain

6.1 Transport network user plane

6.1.1 General

The following figure shows the protocol stack for the transport network user plane on the Iu interface towards the packet switched domain.

GTP-U
UDP
IP
AAL5
ATM

The protocol architecture for the User Plane of the Iu interface towards the packet switched domain shall be GTP-U [17] over UDP over IP over AAL5 over ATM. One or several AAL5/ATM permanent VC's may be used as the common layer 2 resources between the UTRAN and the packet switched domain of the CN.

One switched VC may be used per user flow. The standardisation of the procedures and protocols for use of Switched VC is outside the scope of 3GPP.

Congestion control shall be performed over the Iu user plane toward the packet switched domain using buffer management and no flow control.

6.1.2 GTP-U

The GTP-U [17] protocol shall be used over the Iu interface toward the packet switched domain.

6.1.3 UDP /IP

The path protocol used shall be UDP [12], which is specified in RFC 768. Both the IPv4 [13] and IPv6 [16] IP protocols shall be supported which are specified in RFC 791 (IPv4) or RFC 2460 (IPv6).

The IP addresses for the CN and RNC nodes are exchanged using RANAP signalling. The packet processing function in the CN <u>shall</u> sends downstream packets to the RNC IP address received in the RANAP signalling. The packet processing function in the RNC <u>shall</u> sends upstream packets to the CN IP address received in the RANAP signalling.

The GTP UDP port number as defined in GTP_[17] is shall be used for the destination port for GTP-U control messages and T-PDUs. The sending node shall locally allocates the UDP source port number. For GTP-U control messages, the UDP destination port is shall be the value of the UDP source port of the corresponding GTP-U control message. The UDP source port is shall be the value of the UDP destination port of the corresponding GTP-U control message.

6.1.4 ATM Adaptation Layer Type 5 (I.363.5)

AAL5 shall be used according to I.363.5 [3].

AAL5 virtual circuits are shall be used to transport the IP packets across the Iu interface toward the packet switched domain. Multiple VCs can-may be used over the interface. There is a one-to-one relationship between the VC and the IP address as required by Classical IP over ATM. An association must-shall be made between a peer node's IP address and a VC. This association can-shall be made using O&M or using ATM Inverse ARP according to Classical IP over ATM when PVCs are used.

Classical IP over ATM protocols are shall be used to carry the IP packets over the ATM transport network when PVCs are used. Classical IP over ATM is specified in IETF RFC 2225 [15]. Multiprotocol Encapsulation over AAL5 is specified in IETF RFC 1483 [14].

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6.2 Transport network control plane

ALCAP is not required over the Iu interface towards the packet switched domain.

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MS test specifications BSS test specifications O&M specifications



Other comments:



3.3 Abbreviations

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For the purposes of the present document, the following abbreviations apply:

AAL	ATM Adaptation Layer
AESA	ATM End System Address
ALCAP	Access Link Control Application Part
ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
RFC	Request For Comment
CN	Core Network
GTP	GPRS Tunnelling Protocol
IP	Internet Protocol
LIS	Logical IP Subnet
MTP3b	Message Transfer Part level 3 for Q.2140
NSAP	Network Service Access Point
PDU	Protocol Data Unit
RNC	Radio Network Controller
SAR	Segmentation and Reassembly
SCCF-NNI	Service Specific Coordination Function-Network Node Interface
SSCOP	Service Specific Connection Oriented Protocol
SSCS	Service Specific Convergence Sublayer
UDP	User Datagram Protocol
VC	Virtual Circuit

Classical IP over ATM protocols are used to carry the IP packets over the ATM transport network when PVCs are used. Classical IP over ATM is specified in IETF RFC 2225 [15]. Multiprotocol Encapsulation over AAL5 is specified in IETF RFC 1483 [14].

<u>Classical IP over ATM allows routers to be members of one or more LISs. The CN side of the Iu interface shall provide</u> <u>IP routing functionalities. The RNC side of the Iu interface may provide routing functionalities. If the RNC side of the Iu interface does not provide routing functionalities, the RNC routing tables shall include default route entries.</u>