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Universal Mobile Telecommunications System (UMTS); UTRAN Iub Interface: general aspects and principles (3GPP TS 25.430 version 16.0.0 Release 16)

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Foreword

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1 Scope

The present document is an introduction to the TSG RAN TS 25.43x series of UMTS Technical Specifications that define the Iub Interface. The Iub interface is a logical interface for the interconnection of Node B and Radio Network Controller (RNC) components of the UMTS Terrestrial Radio Access Network (UTRAN) for the UMTS system.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 25.401: "UTRAN overall description".
 - [2] 3GPP TS 25.442: "UTRAN implementation-specific O&M transport".
 - [3] 3GPP TS 25.432: "UTRAN Iub interface: signalling transport".
 - [4] 3GPP TS 25.302: "Services provided by the physical layer".
 - [5] 3GPP TS 25.431: "UTRAN Iub interface layer 1".
 - [6] Void
 - [7] 3GPP TS 25.433: "UTRAN Iub interface Node B Application Part (NBAP) signalling".
 - [8] 3GPP TS 25.434: "UTRAN Iub Interface Data Transport and Transport Signalling for Common Transport Channel Data Streams".
 - [9] 3GPP TS 25.435: "UTRAN Iub Interface user plane protocols for Common Transport Channel data streams".
 - [10] 3GPP TS 25.426: "UTRAN Iur and Iub Interface data transport & transport signalling for DCH data streams".
 - [11] 3GPP TS 25.427: "UTRAN Iur/Iub Interface user plane protocol for DCH data streams".
 - [12] 3GPP TS 25.402: "Synchronization in UTRAN Stage 2".
 - [13] ITU-T Recommendation Q.2630.2 (1999-12): "AAL type 2 Signalling Protocol (Capability Set 2)".
 - [14] 3GPP TS 25.319: "Enhanced Uplink; Overall description; Stage 2".
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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Propagation delay (PD): it is the round trip propagation delay of the radio signal from the Node B to the UE and back to the BS in one chip resolution.

Timing Advance (TA): it is the amount of time, expressed in number of chips, by which the transmission of an uplink burst is anticipated by the UE in order to be received by the cell inside the corresponding time slot.

3.2 Abbreviations

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

AAL2	ATM Adaptation Layer type 2
AAL5	ATM Adaptation Layer type 5
AICH	Acquisition Indication Channel
ALCAP	Access Link Control Application Part
ATM	Asynchronous Transfer Mode
BCH	Broadcast Channel
BCCH	Broadcast Control Channel
CCH	Control Channel
CPCId	Common Physical Channel Identifier
CPICH	Common Pilot Channel
CTCId	Common Transport Channel Identifier
CRNC	Controlling Radio Network Controller
DCH	Dedicated Transport Channel
DPCCH	Dedicated Physical Control Channel
DPCH	Dedicated Physical Channel
DSCH	Down-link Shared Channel
E-DCH	Enhanced Dedicated Channel
FACH	Forward Access Channel
FAUSCH	Fast Up-link Signalling Channel
FDD	Frequency Division Duplex
F-DPCH	Fractional DPCH
HARQ	Hybrid Automatic Repeat Request
HS-DSCH	High Speed Downlink Shared Channel
IP	Internet Protocol
MICH	MBMS notification Indicator Channel
NBAP	Node B Application Part
O&M	Operation and Maintenance
PICH	Page Indication Channel
PCCH	Paging Control Channel
PCCPCH	Primary Common Control Physical Channel
PCPICH	Primary Common Pilot Channel
PCH	Paging Channel
PDSCH	Physical Downlink Shared Channel
PLCCH	Physical Layer Common Control Channel
PRACH	Physical Random Access Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RNC	Radio Network Controller
RNS	Radio Network Subsystem
SCH	Synchronization Channel
SCCPCH	Secondary Common Control Physical Channel
SCPICH	Secondary Common Pilot Channel
SCTP	Stream Control Transmission Protocol
SRNC	Serving Radio Network Controller
SSCF-UNI	Service Specific Co-ordination Function - User Network Interface
SSCOP	Service Specific Connection Oriented Protocol
TDD	Time Division Duplex
UE	User Equipment
UC-ID	UTRAN Cell Identifier
UDP	User Datagram Protocol
UMTS	Universal Mobile Telecommunication System
USCH	Up-link Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

3.3 Specification Notations

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

- [FDD] This tagging of a word indicates that the word preceding the tag "[FDD]" applies only to FDD. This tagging of a heading indicates that the heading preceding the tag "[FDD]" and the section following the heading applies only to FDD.
- [TDD] This tagging of a word indicates that the word preceding the tag "[TDD]" applies only to TDD, including 7.68 Mcps TDD, 3.84Mcps TDD and 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[TDD]" and the section following the heading applies only to TDD, including 7.68 Mcps TDD, 3.84Mcps TDD and 1.28Mcps TDD.
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- Procedure When referring to a procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Radio Network Layer procedures.
- Message When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. RADIO LINK SETUP REQUEST message.
- Frame When referring to a control or data frame in the specification the CONTROL/DATA FRAME NAME is written with all letters in upper case characters followed by the words "control/data frame", e.g. DCH transport frame.

4 General Aspects

4.1 Introduction

The logical interface between a RNC and a Node B is called the Iub interface.

4.2 Iub Interface General Principles

The general principles for the specification of the Iub interface are as follows:

- Transmission sharing between the GSM/GPRS Abis interface and the Iub interface shall not be precluded.
- The functional division between RNC and Node B shall have as few options as possible.
- Iub should be based on a logical model of Node B.
- Node B controls a number of cells and can be ordered to add/remove radio links in those cells.
- Neither the physical structure nor any internal protocols of the Node B shall be visible over Iub and are thus not limiting factors, e.g., when introducing future technology.
- Only the logical O&M (TS 25.401 [1]) of Node B is supported by the Iub.
- Complex functionality shall as far as possible be avoided over Iub. Advanced optimisation solutions may be added in later versions of the standard.
- The Iub functional split shall take into account the probability of frequent switching between different channel types.

4.3 Iub Interface Specification Objectives

The I_{ub} interface specifications shall facilitate the following:

- Inter-connection of RNCs and Node Bs from different manufacturers.
- Separation of I_{ub} interface Radio Network functionality and Transport Network functionality to facilitate introduction of future technology.

The Iub parts to be standardised are:

1. User data transport.
2. Signalling for handling the user data.
3. Node B Logical O&M (TS 25.401 [1]).

Note: It should be possible to transport the Implementation Specific O&M (TS 25.401 [1]) interface via the same transport bearer as the Iub interface and, hence, the lower layer transport mechanisms should be standardised to this effect. The application level content of the Implementation Specific O&M interface is out of scope of UTRAN standardization. Where the implementation specific O&M interface shares the same bearer as the Iub interface, the transport layers shall be as specified in TS 25.442 [2] and TS 25.432 [3] respectively.

4.4 Iub Interface Capabilities

4.4.1 Radio application related signalling

The Iub interface allows the RNC and the Node B to negotiate about radio resources, for example to add and delete cells controlled by the Node B to support communication of the dedicated connection between UE and SRNC.