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Introduction

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Technical Specification

**3rd Generation Partnership Project (3GPP);
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UTRAN I_{ub} Interface: General Aspects and Principles

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Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of this TS are subject to continuing work within 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

- m indicates [major version number]
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated into the specification.

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.
- 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] UMTS TS 25.401 UTRAN Overall Description
- [2] UMTS TS 25.442 UTRAN Implementation Specific O&M transport
- [3] UMTS TS 25.432 UTRAN Iub interface signalling transport
- [4] UMTS TS 25.302 Services Provided by the Physical Layer
- [5] UMTS TS 25.431 UTRAN Iub Interface: Layer 1
- [6] UMTS TS 25.432 UTRAN Iub Interface: Signalling Transport
- [7] UMTS TS 25.433 NBAP Specification
- [8] UMTS TS 25.434 UTRAN Iub Interface: Data Transport & Transport Signalling for Common Transport Channel Data Streams
- [9] UMTS TS 25.435 UTRAN Iub Interface: User Plane Protocols for Common Transport Channel Data Streams
- [10] UMTS TS 25.426 UTRAN Iur/Iub Interface: Data Transport & Transport Signalling for DCH Data Streams
- [11] UMTS TS 25.427 UTRAN Iur/Iub Interface: User Plane Protocol for DCH Data Streams

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the [following] terms and definitions [given in ... and the following] 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 Symbols

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

3.3 Abbreviations

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

AAL2	ATM Adaptation Layer type 2
AAL5	ATM Adaptation Layer type 5
ALCAP	Access Link Control Application Part
ATM	Asynchronous Transfer Mode
BCH	Broadcast Channel
BCCH	Broadcast Control Channel
CCH	Control Channel
CRNC	Controlling Radio Network Controller
DCH	Dedicated Transport Channel
DPCCH	Dedicated Physical Control Channel
DRNC	Drift Radio Network Controller
DSCH	Down-link Shared Channel
FACH	Forward Access Channel
FAUSCH	Fast Up-link Signalling Channel
FDD	Frequency Division Duplex
FP	Frame Protocol
NBAP	NodeB Application Part
O&M	Operation and Maintenance
PCCH	Paging Control Channel
PCH	Paging Channel
RACH	Random Access Channel
RNC	Radio Network Controller
RNS	Radio Network Subsystem
SCCP	Signalling Connection Control Part
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
3GPP	

UMTS	Universal Mobile Telecommunication System
USCH	Up-link Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

4 General Aspects

4.1 Introduction

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

4.2 I_{ub} 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 NodeB shall have as few options as possible;
- Iub should be based on a logical model of NodeB;
- NodeB 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 NodeB shall be visible over Iub and are thus not limiting factors, e.g., when introducing future technology.
- Only the logical O&M [1] of NodeB 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 I_{ub} Interface Specification Objectives

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

- Inter-connection of RNCs and NodeBs 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
2. Signalling for handling the user data
3. NodeB Logical O&M [1] ¹.

¹ It should be possible to transport the Implementation Specific O&M [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 standardisation. Where the implementation specific O&M interface shares the same bearer as the Iub interface, the transport layers shall be as specified in [2] and [3] respectively.

4.4 Iub Interface Capabilities

The Iub interface connects a RNC and a Node B.

The information transferred over the Iub reference point can be categorised as follows:

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. Information used to control the broadcast and paging channels, and information to be transported on the broadcast and paging channels, belong to this category also. In addition, logical O&M [1] between the Node B and RNC shall also be included in this category.

4.4.2 Iub/Iur DCH data stream

The Iub interface provides means for transport of uplink and downlink DCH transport frames between RNC and Node B.

4.4.3 Iub RACH data stream

The Iub interface provides means for transport of uplink RACH transport frames between RNC and Node B..

4.4.4 Iub FACH data stream

The Iub interface provides means for transport of downlink FACH transport frames between RNC and Node B.

4.4.5 Iub DSCH data stream

The Iub interface provides the means for transport of downlink shared channel, DSCH, data frames between RNC and Node B.

4.4.6 Iub TDD USCH data stream

The Iub interface provides the means for transport of uplink shared channel, USCH, data frames between Node B and RNC.

4.4.7 Iub PCH data stream

The Iub interface provides means for transport of PCH transport frames between RNC and Node B.

4.5 Iub Interface Characteristics

4.5.1 Mapping of Iub data streams

- DCH

One Iub DCH data stream is carried on one transport bearer except in the case of coordinated DCHs in which case a set of coordinated DCHs are multiplexed onto the same transport bearer.

- RACH

One Iub RACH data stream is carried on one transport bearer. For each RACH in a cell, an Iub RACH data stream must be established over the Iub interface.

- FACH

One Iub FACH data stream is carried on one transport bearer. For each FACH in a cell, an Iub FACH data stream must be established over the Iub Interface.

- DSCH

One Iub DSCH data stream is carried on one transport bearer.

- TDD USCH

One Iub TDD USCH data stream is carried on one transport bearer.

- PCH

One Iub PCH data stream is carried on one transport bearer.

4.6 I_{ub} Protocols

There shall exist a clear separation between the radio network layer and the transport layer. Therefore, the radio network signalling and Iub data streams are separated from the data transport resource and traffic handling as show in **Error! Reference source not found.** ~~Figure 1~~. This resource and traffic handling is controlled by the Transport Signalling. The Transport Signalling is carried by a Signalling Bearer over the Iub interface.

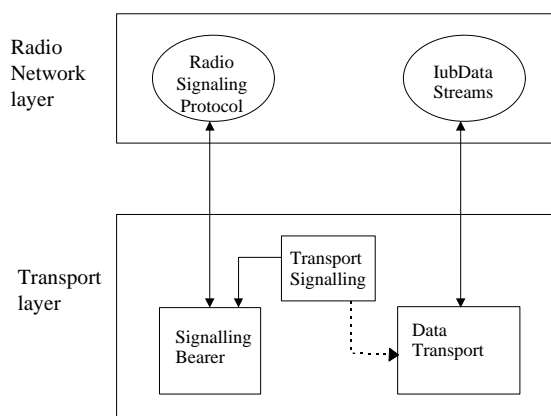


Figure 1 Separation of Radio Network protocols and transport over Iub

5 Functions of the I_{ub} Interface Protocols

5.1 Iub Functions

The list of functions on the Iub interface is the following:

1. Management of Iub Transport Resources
2. Logical O&M of Node B
 - Iub Link Management
 - Cell Configuration Management
 - Radio Network Performance Measurements
 - Resource Event Management

- Common Transport Channels Management
 - Radio Resource Management
 - System Information Update
3. Implementation Specific O&M Transport
 4. Traffic Management of Common Channels
 - Admission Control
 - Power Management
 - Data Transfer
 5. Traffic Management of Dedicated Channels
 - Radio Link Set-up
 - Channel Allocation / De-allocation
 - Power Management
 - Measurement Reporting
 - Dedicated Transport Channel Management
 - Data Transfer
 6. Traffic Management of Downlink Shared Channels
 - Channel Allocation / De-allocation
 - Power Management
 - Transport Channel Management
 - Data Transfer
 7. Traffic Management of Uplink Shared Channels
 - Channel Allocation / De-allocation
 - Power Management
 - Transport Channel Management
 - Data Transfer
 8. Timing and Synchronisation Management
 - Transport Channel Synchronisation (Frame synchronisation)
 - Node B – RNC node Synchronisation.
 - Inter Node B node Synchronisation.

5.2 Functional split over Iub

5.2.1 Logical O&M of Node B

Logical O&M is the signalling associated with the control of logical resources (channels, cells,...) owned by the RNC but physically implemented in the Node B. The RNC controls these logical resources. A number of O&M procedures

physically implemented in Node B impact on the logical resources and therefore require an information exchange between RNC and Node B. All messages needed to support this information exchange are classified as Logical O&M forming an integral part of NBAP over the Iub interface.

5.2.2 System Information Update

System Information is sent by the CRNC to a Node B. Scheduling of system broadcast information is also carried out in the CRNC. System information and scheduling information are sent by the CRNC to the Node B. The Node B is responsible for transmitting the received system information according to the scheduling parameters provided.

5.2.3 Traffic management

5.2.3.1 Management of dedicated resources

These functions are related to the activation of logical resources (e.g. Radio Links, Iub ports), and the connection of these various resources together.

Some freedom may be left to Node B on some functions like soft combining for FDD within Node B, since soft combining has merits for being executed as close as possible to the radio (both in terms of transmission cost and efficiency).

5.2.3.2 Management of common radio channels

The common channels need to be controlled from the RNC. This is typically the control of the RACH channel, the information that is broadcast on the Broadcast control channel, and the control and request for sending information on the paging channels.

5.2.4 FDD Macro-diversity Combining of Radio Frames

Node B may perform macro-diversity combining/splitting of data streams communicated via its cells. RNC performs macro-diversity combining/splitting of Iub data streams received from/sent to several Node B(s).

5.2.5 FDD Control of Macro-diversity Combining/Splitting Topology

When requesting the addition of a new cell for a UE-UTRAN connection, the RNC can explicitly request to the Node B a new Iub data stream, in which case the macro-diversity combining and splitting function within the Node B is not used for that cell. Otherwise, the Node B takes the decision whether macro-diversity combining and splitting function is used inside the Node B for that cell i.e. whether a new Iub data stream shall be added or not.

The internal Node B handling of the macro-diversity combining/splitting of radio frames is controlled by the Node B.

5.2.6 Handover Decision

To support mobility of the UE to UTRAN connection between cells, UTRAN uses measurement reports from the UE and detectors at the cells.

The RNC takes the decision to add or delete cells from the connection.

5.2.7 Handling of Node B Hardware Resources

Mapping of Node B logical resources onto Node B hardware resources, used for Iub data streams and radio interface transmission/reception, is performed by Node B.

5.2.8 Allocation of Physical Channel Resources

In FDD allocation of downlink channelisation codes of cells belonging to Node B is performed in the CRNC.

In TDD allocation of uplink and downlink physical channel resources of cells belonging to Node B is performed in the CRNC.

5.2.9 UpLink Power Control

This function controls the level of the transmitted power in order to minimise interference and keep the quality of the connections. The function uplink Outer Loop Power Control located in the SRNC sets the target quality for the uplink Inner Loop Power Control function. In FDD Inner Loop Power Control Function is located in Node B, while in TDD it is located in the UE.

5.2.10 Down-Link Power Control

This function controls the level of the downlink transmitted power. In FDD it is also used to correct the downlink power drifting between several radio links. A SRNC regularly (or under some algorithms) sends the target down link power range based on the measurement report from UE.

5.2.11 Admission Control

The Admission Control function based on uplink interference and downlink power is located in the CRNC.

Node B shall report uplink interference measurements and downlink power information over the Iub.

The CRNC controls this reporting function, i.e. if these information need to be reported and the period of these reports.

Note : The possibility to have this Admission Control function in Node B is FFS.

5.2.12 Power and Interference Management

A threshold for reporting may be given to NodeB from the CRNC to prevent frequent reporting over the Iub. NodeB shall have a function to measure "uplink interference level and downlink TX Power" and a function to compare the averaged "uplink interference level and downlink TX power" with the threshold value. NodeB shall also have a function to report when the average measured value exceeds the threshold value. The CRNC shall have a function to modify the "threshold value" for neighbour cell co-ordination.

An indication of exceeding uplink interference threshold or downlink TX power can be included as a cause of failure when a NodeB is requested to set-up a radio link or add to an existing radio link. This may be used when a number of radio links set-up requests or additions are received on the Iub during the reporting interval.

6. Node B logical Model over Iub

6.1 Overview

The model described in Figure 2 shows the Node B as seen from the controlling RNC. The model includes:

- the logical resources provided by Node B to UTRAN (via its Controlling RNC)
- the dedicated channels which have been established on Node B
- the common channels that Node B provides to the RNC

The procedures for controlling the connections between radio links and Iub DCH data ports are sent from the RNC to the Node B via the Communication Control Ports.

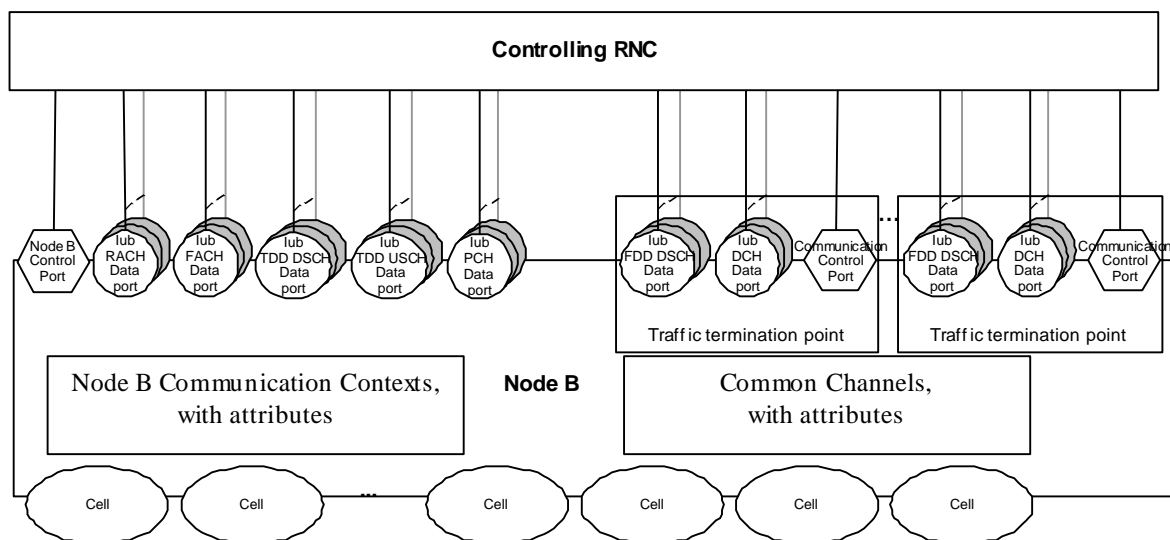


Figure 2 Logical Model of Node B

6.2 Elements of the logical model

6.2.1 Radio Network Logical resources

A Cell is identified by:

- a Cell identifier.

The semantics of a Cell include the following:

- It is created and destroyed by administrative procedures e.g. when a cell site and/or RF carrier is added to, or deleted from, the RNS.

Node B may have one or more cells.

6.2.2 Transport network logical resources

6.2.2.1 Node B Control Port

The Node B Control Port is used to exchange the signalling information for the logical O&M of Node B, the creation of Node B Communication Contexts, the configuration of the common transport channels that Node B provides in a given cell, PCH and BCH control information between the RNC and the Node B. The Node B Control Port corresponds to one signalling bearer between the controlling RNC and the Node B. There is one Node B Control Port per Node B.

6.2.2.2 Communication Control Port

A Communication Control Port corresponds to one signalling bearer between the RNC and Node B for the control of Node B Communication Contexts. One signalling bearer between RNC and Node B can at most correspond to one Communication Control Port. Node B may have multiple Communication Control Ports (one per Traffic Termination Point). The Communication Control Port is selected at creation of the Node B Communication Context.

6.2.2.3 Traffic Termination Point

Traffic Termination Point represents DCH and FDD DSCH data streams belonging to one or more Node B Communication Contexts (UE contexts), which are controlled via one Communication Control Port. The Traffic Termination Point is thus a descriptive entity which neither is controlled over Iub nor by O&M.

6.2.2.4 Iub DCH Data Port

One Iub DCH Data port represents one user plane transport bearer. One user plane transport bearer will carry only one DCH data stream except in the case of coordinated DCHs, in which case the data streams of all combined DCHs shall be multiplexed on one and the same user plane transport bearer.

6.2.2.5 Iub RACH Data Port

An Iub RACH Data Port represents a user plane bearer carrying one Iub RACH Data Stream between the Node B and the RNC. There is one RACH Data Port for each RACH channel of Node B.

6.2.2.6 Iub FACH Data Port

An Iub FACH Data Port represents a user plane bearer carrying one Iub FACH Data Stream between the Node B and the RNC. There is one CCH Data Port for each FACH channel of Node B.

6.2.2.7 Iub FDD DSCH Data Port

An Iub FDD DSCH Data Port represents a user plane bearer carrying one Iub FDD DSCH Data Stream between the Node B and the RNC. For each DSCH there is one Iub FDD DSCH Data Port per NodeB communication context with data multiplexed on this DSCH. Each DSCH is associated with a downlink DPCCCH.

6.2.2.8 Iub TDD DSCH Data Port

An Iub TDD DSCH Data Port represents a user plane bearer carrying one Iub TDD DSCH Data Stream between the Node B and the RNC. For each DSCH there is one Iub TDD DSCH Data Port with data multiplexed on this DSCH.

6.2.2.9 Iub TDD USCH Data Port

An Iub TDD USCH Data Port represents a user plane bearer carrying one Iub TDD USCH Data Stream between the Node B and the RNC. For each USCH there is one Iub TDD USCH Data Port with data multiplexed on this USCH.

6.2.2.10 Iub PCH Data Port

An Iub PCH Data Port represents an Iub PCH Data Stream between the Node B and the RNC.

6.2.3 Node B Communication Contexts for Dedicated Channels

A Node B Communication Context corresponds to all the dedicated resources that are necessary for a user in dedicated mode and using dedicated channels as restricted to a given Node B.

There are a number of Node B Communication Contexts inside a given Node B.

The attributes to a Node B Communication Context are the following (not exhaustive):

- The list of Cells where dedicated physical resources are used
- The list of DCH which are mapped on the dedicated physical resources for that Node B Communication Context
- The complete DCH characteristics for each DCH, identified by its DCH-identifier [4].
- The list of Iub DCH Data Ports
- For each Iub DCH Data Port, the corresponding DCH and cells which are carried on this data port
- In FDD when the UE is using a DSCH, the identity of the DSCH Common Channel Context.
- Physical layer parameters (outer loop power control, etc)

6.2.4 Common Channels

A Common Channel corresponds to a radio Common Channel as configured by the Node B.

The BCCH is carried directly on the Node B control port using NBAP procedures. This Common Channel will not be mapped to an individual data port.

The RACH has a associated Iub RACH Data Port and the FACH has an associated Iub FACH Data Port.

In FDD each UE multiplexed on each DSCH has an associated Iub DSCH Data Port.

In TDD all UEs multiplexed on a DSCH use the same Iub TDD DSCH Data Port. Furthermore all UEs sharing a USCH use the same Iub TDD USCH Data Port.

The attributes of a Common channel are (not exhaustive)

- Type (RACH, FACH, DSCH, USCH, PCH)
- Cell (only one)
- Associated Iub RACH Data Port for a RACH, Iub FACH Data Port for a FACH, Iub PCH Data Port for the PCH.
- List of associated Iub FDD DSCH Data ports for the DSCH (FDD only).
- Associated Iub TDD DSCH Data port for a DSCH (TDD only)
- Associated Iub USCH Data port for a USCH (TDD only)
- List of Node B Communication contexts identity
- Physical parameters

7 Iub Interface Protocol Structure

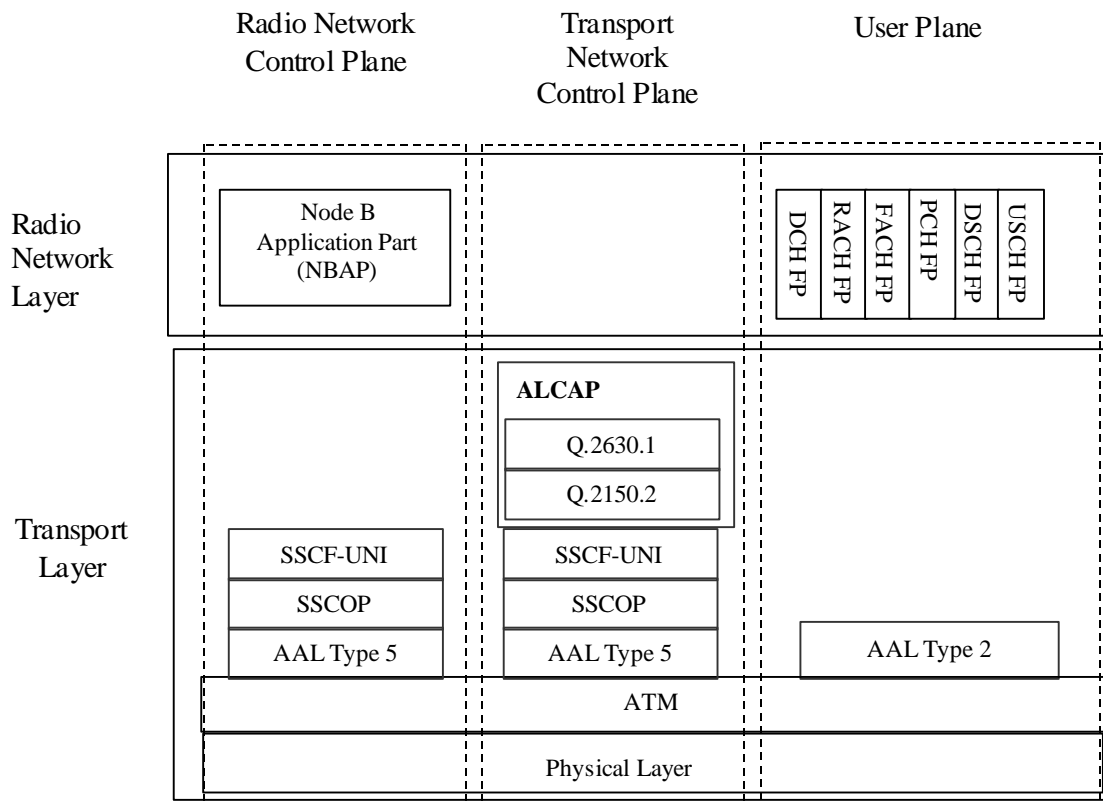


Figure 3: Iub Interface Protocol Structure.

The Iub interface protocol architecture consists of two functional layers:

1. Radio Network Layer, defines procedures related to the operation of Node B. The radio network layer consists of a radio network control plane and a radio network user plane.
2. Transport Layer, defines procedures for establishing physical connections between Node B and the RNC.

There shall be one dedicated AAL2 connection for each RACH and each FACH transport channel.

8 Other Iub Interface Specifications

8.1 UTRAN Iub Interface: Layer 1 (TSG RAN 25.431)

This document[5] specifies the standards allowed for the implement of Layer 1 (physical layer) on the I_{ub} interface.

8.2 UTRAN Iub Interface: Signalling Transport (TSG RAN 25.432)

This document[6] specifies the signalling transport related to NBAP signalling to be used across the Iub Interface.

8.3 NBAP Specification (TSG RAN 25.433)

This document[7] specifies the standards for NBAP specification to be used over Iub Interface.

8.4 UTRAN Iub Interface: Data Transport & Transport Signalling for Common Transport Channel Data Streams (TSG RAN 25.434)

This document[8] provides a specification of the UTRAN RNC-Node B (Iub) interface Data Transport and Transport Signalling for Common Transport Channel data streams.

8.5 UTRAN Iub Interface: User Plane Protocols for Common Transport Channel Data Streams (TSG RAN 25.435)

This document[9] provides a specification of the UTRAN RNC-Node B (Iub) interface user plane protocols for Common Transport Channel data streams.

8.6 UTRAN Iur/Iub Interface: Data Transport & Transport Signalling for DCH Data Streams (TSG RAN 25.426)

This Technical Specification[10] specifies the transport bearers for the DCH data streams on UTRAN Iur and Iub interfaces. The corresponding Transport Network Control plane is also specified.

8.7 UTRAN Iur/Iub Interface: User Plane Protocol for DCH Data Streams (TSG RAN 25.427)

This document[11] provides a specification of the UTRAN Iur and Iub interfaces user plane protocols for Dedicated Transport Channel data streams.

8.8 Summary of UTRAN Iub Interface Technical Specifications

The relationship between the technical specifications that define the UTRAN Iub interface is shown in figure 5.

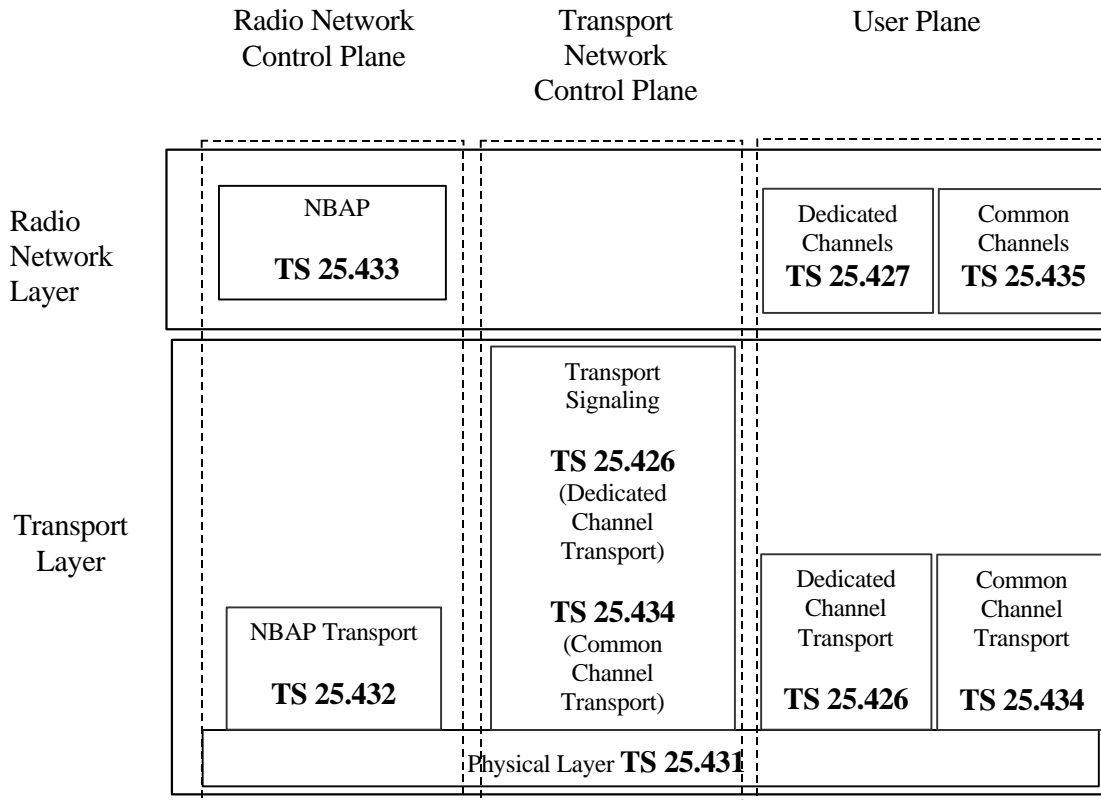


Figure 5: Iub Interface Technical Specifications.

9 Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

10History

Document history		
V0.0.1	1999-02	Initial Specification Structure
V0.0.2	1999-02	Inclusion of complete text from sections 6,7 and 8 of the baseline specification entitled "Merged Description of Iub Interface, Version 0.0.2"
V0.0.3	1999-03	Included new TTC Protocol Structure figure and removed AAL-5 in the user plane along with associated transport control.
V0.1.0	1999-04	Approved by TSG RAN WG3
V0.1.1	1999-05	<p>Incorporated changes agreed during the RAN WG3 meeting (Kawasaki) including:</p> <p>Statement of scope and overview of Other Iub specifications (Tdoc R3-99274),</p> <p>UTRAN Architecture (section 4.1) , Interface Characteristics (section 4.4),</p> <p>Functional Split over the Iub (section 5.2), Node B logical Model over Iub (section 6) taken from TS25.401 UTRAN Overall Architecture (proposed in Tdoc R3-99274)</p> <p>Protocol Structure combining separate TTC and ETSI stacks (Tdoc R3-99274)</p> <p>Added the functional split for Power and Interference Management (section 5.2.10) taken from Tdoc R3-99365</p> <p>Added assumption from TS 25.434 (Tdoc R3-99400) that MAC scheduling for common channels is done in the RNC into section 7.</p> <p>Inclusion of DSCH Data Port concepts into the NodeB Logical model based on Tdoc R3 99308.</p>
V0.1.2	1999-06	<p>Updated DCH descriptions in NodeB Logical Model to accommodate combined DCH concept from Tdoc 99-450.</p> <p>Updated NodeB Logical Model for TDD mode including USCH for TDD from Tdoc 99-496.</p> <p>Aligned O&M terminology/functions with current O&M specifications from Tdoc 99-469.</p>
V0.1.3	1999-06	Corrections to additions made from Tdoc 99-469
V0.1.4	1999-07	Editorial Updates from Tdoc 99-765
V0.2.0	1999-08	<p>Addition of PCH Data port based on Tdoc 99-934</p> <p>Addition of Propagation delay definition based on Tdoc 99-A05</p>
V0.2.1	1999-09	<p>Addition of :TDD aspects based on Tdoc 99a92 conclusion..</p> <p>Clarification of Communication Context mapping to signalling bearers based on Tdoc 99a62</p> <p>Addition of the agreement that there is one NodeB control port per Node B</p>

V0.3.0	1999-09	<p>Addition of TDD aspects based on Tdoc 99-b92</p> <p>Clarification of Multiplexing Communication Control Ports based on Tdoc 99-b62</p> <p>Inclusion of the decision that there is one Node B control port per Node B</p> <p>Section 4.1 UTRAN Architecture becomes Introduction – figure removed.</p> <p>Section 5.2 Functional Split over the Iub – added text for the functions Logical O&M (based on text from 25.401) and System Information Update (based on 99-b63 discussed at this meeting).</p> <p>Other editorial changes and comments</p>
V2.0.0	1999-09	Approved at RAN WG3#7
Editor for 3GPP RAN TS 25.430 is:		
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This document is written in Microsoft Word version 7/97.		

Annex A Document Stability Assessment Table

Section	Title	Content missing	Incomplete	Restructuring needed	Checking needed	Editorial work required	Finalisation needed	Almost stable	Stab
1	Scope								√
2	References								√
3	Definitions, symbols and abbreviations								
3.1	Definitions				√				
3.2	Symbols								√
3.3	Abbreviations								√
4	General Aspects								
4.1	Introduction							√	
4.2	I _{ub} Interface General Principles								√
4.3	I _{ub} Interface Specification Objectives								√
4.4	I _{ub} Interface Capabilities								√
4.5	I _{ub} Interface Characteristics								√
4.5.1	Mapping of Iub Data Streams								√
4.6	Iub Protocols							√	
5	Functions of the I _{ub} Interface Protocols								
5.1	Iub Functions	-		√					
5.2	Functional split over Iub	√		√					
6	Node B logical Model over Iub						√		

6.1	Overview						√		
6.2	Elements of the logical model	√							
7	I _{ub} Interface Protocol Structure							√	
8	Other I _{ub} Interface Specifications							√	
9	Bibliography								

Annex B Open Issues relating to this specification

B.1 Iub Functional Split (section 5)

Some restructuring of this section is proposed. Not all the Functions across the Iub interface have been described and further contributions are expected.

B.2 Node B Logical Model (section 6)

It is agreed that the Node B Logical Model needs extending to include all the objects identified across the Iub interface. Further contributions are expected.