TSG-RAN meeting #5 *TSGRP#5(99)453*
Kyongju City, Korea, 6 - 8 October 1999

Source: Editor

Title: UMTS 25.427: Iur/Iub User plane protocol for DCH data streams, v.2.0.0

Document for: Approval

TS 25.427 V 2.0.0 (1999-09)

Technical Specification

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN;

UTRAN Iub/Iur Interface User Plane Protocol for DCH Data Streams

3GPP

Reference

<Workitem> (<Shortfilename>.PDF)

Keywords

<keyword[, keyword]>

3GPP

Postal address

Office address

Internet

secretariat@3gpp.org

Individual copies of this deliverable
can be downloaded from
http://www.3gpp.org

Contents

1 Intellectual Property Rights

[IPRs essential or potentially essential to the present deliverable may have been declared to ETSI/3GPP. The information pertaining to these essential IPRs, if any, is publicly available for ETSI members and non-members, free of charge. This can be found in the latest version of the ETSI Technical Report: ETR 314: "Intellectual Property Rights (IPRs); Essential or potentially Essential, IPRs notified to ETSI in respect of ETSI standards". The most recent update of ETR 314, is available on the ETSI web server or on request from the Secretariat.
Pursuant to the ETSI Interim IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in the ETR 314, which are, or may be, or may become, essential to the present document.]

Note: The content has to be reviewed according to the 3GPP IPR rules.

2 Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project, Technical Specification Group TSG RAN.
The contents of this TS may be subject to continuing work within the 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.

3 Scope

This document shall provide a description of the UTRAN Iur and Iub interfaces user plane protocols for Dedicated Transport Channel data streams as agreed within the TSG-RAN working group 3.

4 References

[1]: TS UMTS 25.301, *Radio Interface Protocol Architecture*

[2]: TS 25.401 UTRAN architecture description

[3]: TS 25.302 Services provided by the Physical Layer, Source WG2

5 Definitions, symbols and abbreviations

5.1 Definitions

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

Transport Connection: Service provided by the transport layer and used by Frame Protocol for the delivery of FP PDU.

5.2 Symbols

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

5.3 Abbreviations

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

CFN	Connection Frame Number
CRC	Cyclic Redundancy Checksum
CRCI	CRC Indicator
DCH	Dedicated Transport Channel
DL	Downlink
DSCH	Downlink Shared Channel
FP	Frame Protocol
FT	Frame Type
PC	Power Control
QE	Quality Estimate
TB	Transport Block
TBS	Transport Block Set
TFI	Transport Format Indicator
ToA	Time of arrival
TTI	Transmission Time Interval
UL	Uplink

6 General aspects

The specification of I_{ub} DCH data streams is also valid for I_{ur} DCH data streams.

The SRNC is responsible for creating communications inside the SRNS. The SRNC provides to the Node B the complete configuration of the Transport channels to be provided by the Node B for a given communication.
The parameters of a Transport channel are described in [1]. These Transport channels are multiplexed on the downlink by the Node B on radio physical channels, and de-multiplexed on the uplink from radio physical channels to Transport channels.
Every set of coordinated Transport channel related to one UE context that is communicated over a set of cells that are macro-diversity combined within Node B or DRNC, is carried on one transport connection. This means that there are as many transport connections as set of coordinated Transport channels and User ports for that communication.
Bi-directional transport connections are used.

6.1 DCH FP services

DCH frame protocol provides the following services:

- Transport of TBS across Iub and Iur interface.
- Transport of outer loop power control information between the SRNC and the Node B
- Support of transport channel synchronisation mechanism
- Support of Node Synchronisation mechanism
- Transfer of DSCH TFI from SRNC to Node B
- Transfer of Rx timing deviation (TDD) from the Node B to the SRNC.

6.2 Services expected from data transport

Following service is required from the transport layer:

- In sequence delivery of FP PDU

7 DCH Frame Protocol procedures

7.1 Data transfer

When there is some data to be transmitted, DCH data frames are transferred every transmission time interval between the SRNC and the Node B for downlink transfer, and between Node B and SRNC for uplink transfer.

An optional error detection mechanism may be used to protect the data transfer if needed. At the transport channel setup it shall be specified if the error detection on the user data is used.

7.1.1 Uplink

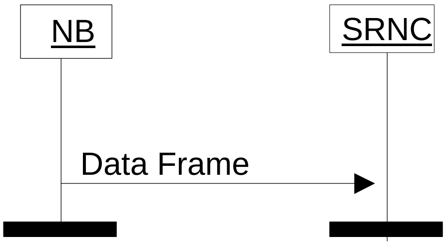

Figure 1: Uplink data transfer

Two modes can be used for the UL transmission: *normal mode* and *silent mode*. The mode is selected by the SRNC when the transport connection is setup and signaled to the Node B with the relevant control plane procedure.

- In normal mode, NodeB shall always send an UL data frame to the RNC for all the DCHs in a set of coordinated DCHs regardless of length of Transport Block of DCHs, i.e. also when it has received zero bits for a transport channel during a certain TTI.

- In silent mode and in case only one transport channel is transported on a transport bearer, the node-B shall not send an UL data frame to the RNC when it has received zero bits for a transport channel during a certain TTI.
  In silent mode and in case of coordinated DCHs, when Node B receives zero bits for all the DCHs in a set of coordinated DCHs, node B shall not send an UL data frame to the RNC for this set of coordinated DCHs.

When UL synchronisation is lost or not yet achieved, UL data frames are not sent to the SRNC.

7.1.2 Downlink

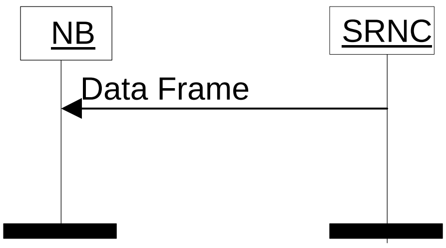

Figure 2: Downlink data transfer

If the Node B does not receive a valid FP frame in a TTI, it assumes that there is no data to be transmitted in that TTI for this transport channel.

At each frame, the Node B shall build the TFCI value of each CCTrCH, according to the TFI of the DCH data frames multiplexed on this CCTrCH and scheduled for that frame. In case the Node receives an unknown combination of DCH data frames, it shall transmit only the DPCCH without TFCI bits.

7.2 Timing adjustment

To keep the synchronisation of a DCH data stream SRNC includes the Connection Frame Number (CFN) to all DL DCH FP frames
If DL data frame arrives outside the determined arrival window, node B should evaluate the time difference between the optimal arrival time for the DL DCH FP frame to be transmitted in the indicated CFN and the actual measured arrival time of the DL DCH FP frame (ToA: time of arrival).
Node B reports the measured ToA and the indicated CFN in one UL DCH FP control frame.

Figure 3: Timing Adjustment

The arrival window and the time of arrival are defined as follows:

Time of Arrival Window Endpoint (ToAWE) : ToAWE represents the time point by which the DL data shall arrive to the node B from Iub. The ToAWE is defined as the amount of milliseconds before the last time point from which a timely DL transmission for the identified CFN would still be possible taking into account the node B internal delays. ToAWE is set via control plane. If data does not arrive before ToAWE a Timing Adjustment Control Frame shall be sent by node B.

Time of Arrival Window Startpoint (ToAWS): ToAWS represents the time after which the DL data shall arrive to the node B from Iub. The ToAWS is defined as the amount of milliseconds from the ToAWE. ToAWS is set via control plane. If data arrives before ToAWS a Timing Adjustment Control Frame shall be sent by node B.

Time of Arrival (ToA) : ToA is the time difference between the end point of the DL arrival window (ToAWE) and the actual arrival time of DL frame for a specific CFN. A positive ToA means that the frame is received before the ToAWE, a negative ToA means that the frame is received after the ToAWE.

The general overview on the timing adjustment procedure is reported in [2].

7.3 Synchronisation

In synchronisation procedure the SRNC sends a DL SYNCHRONISATION control frame towards Node B. This message indicates the target CFN.

Upon reception of the DL SYNCHRONISATION control frame, Node B shall immediately respond with UL SYNCHRONISATION control frame indicating the ToA for the DL synchronisation frame and the CFN indicated in the received DL SYNCHRONISATION message.
UL SYNCHRONISATION control frame shall always be sent, even if the DL SYNCHRONISATION control frame is received by the Node B within the arrival window.
Synchronisation control frames are also used as keep alive frames, in order to maintain activity on the Iur/Iub transport bearer.

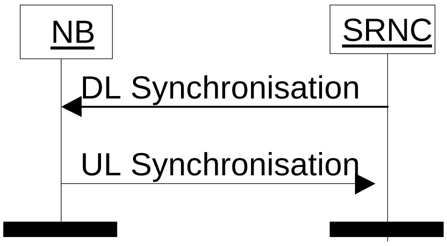

Figure 4. DCH Synchronisation procedure.

7.4 Outer loop PC information transfer

Based, for example, on the CRCI values and on the quality estimate in the UL frames, SRNC modifies the Eb/No setpoint used by the Node B by including the absolute value of the new Eb/No setpoint in one control frame sent to the Node B's. This control frame can be sent via any of the transport connections dedicated to one UE.

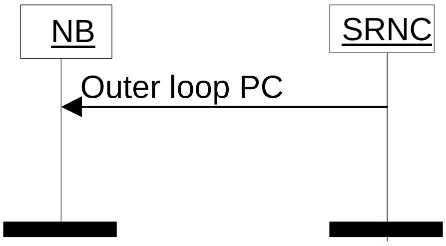

Figure 5: Outer loop power control information transfer

7.5 Node Synchronization

In the Node Synchronization procedure, the SRNC sends a DL Node Synchronization control frame to Node B containing the parameter T1. Upon reception of a DL Node Synchronization control frame, the Node B shall respond with UL Node Synchronization Control Frame, indicating t2 and t3, as well as t1 which was indicated in the initiating DL Node Synchronization control frame.

The t1, t2, t3 parameters are defined as:

> T1: RNC specific frame number (RFN) that indicates the time when RNC sends the frame through the SAP to the transport layer.
>
> T2: Node B specific frame number (BFN) that indicates the time when Node B receives the correspondent DL synchronisation frame through the SAP from the transport layer.
>
> T3: Node B specific frame number (BFN) that indicates the time when Node B sends the frame through the SAP to the transport layer.

The general overview on the Node Synchronisation procedure is reported in [2].

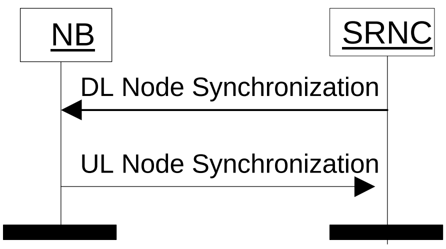

Figure 6 Node Synchronization procedure.

7.6 Rx timing deviation measurement [TDD]

This procedure is applicable in TDD mode only.

The NodeB shall, for all UEs using DCHs, monitor the receive timing of the uplink DPCH bursts arriving over the radio interface, and shall calculate the Rx Timing Deviation. If the calculated value, after rounding, is not zero, it shall be reported to the SRNC in a DCH Control Frame belonging to that UE. For limitation of the frequency of this reporting, the NodeB shall not send more than one Rx Timing Deviation value per UE in a DCH Control Frame within the Rx Timing Deviation measurement reporting period.

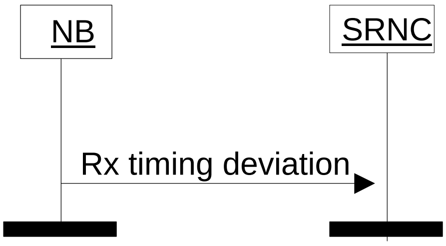

Figure 7: Rx timing deviation

7.7 DSCH TFI Signalling [FDD]

This procedure is used in order to signal the TFI of the DSCH TBS to the Node B. This allows to use the combined TFCI codeword for the signalling of the DCHs and DSCH TFIs in the radio frame.

The procedure consists in the DSCH TFI control frame sent by the SRNC to the Node B. The frame contains the DSCH TFI and the correspondent CFN.

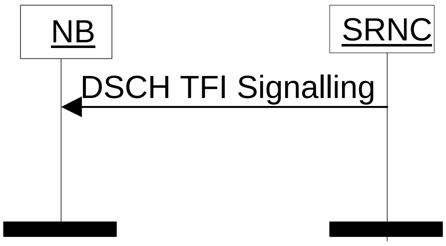

Figure 8: DSCH TFI Signalling

8 Frame structure and coding

8.1 General

The general structure of a DCH FP frame consists of a header anda payload. The structure is depicted in figure below

Header	Payload

Figure 9 General structure of a frame protocol PDU

The header contains a CRC checksum, the frame type field and information related to the frame type.

There are two types of DCH FP frames (indicated by the Frame type field).

- DCH data frame
- DCH control frame

The payload of the data frames contains radio interface user data, quality information for the transport blocks and for the radio interface physical channel during the transmission time interval (for UL only), and an optional CRC field

The payload of the control frames contains commands and measurement reports related to transport bearer and the radio interface physical channel but not directly related to specific radio interface user data.

8.1.1 General principles for the coding

In this specification the structure of frames will be specified by using pictures similar to Figure 10.

<table>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td></td></tr>
<tr><td colspan="6">Field 1</td><td colspan="2">Field 2</td><td>Byte 1</td></tr>
<tr><td colspan="8">Field 3</td><td>Byte 2</td></tr>
<tr><td colspan="4">Field 3 (cont)</td><td colspan="4">Field 4</td><td>Byte 3</td></tr>
<tr><td colspan="8"></td><td>Byte 4</td></tr>
</table>

Figure 10: Example of notation used for the definition of the frame structure.

Unless otherwise indicated, fields which consist of multiple bits within a byte will have the more significant bit located at the higher bit position (indicated above frame in Figure 10). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in Figure 10).
On the Iub/Iur interface, the frame will be transmitted starting from the lowest numbered byte. Within each byte, the bits are sent according decreasing bit position (bit position 7 first).

The parameters are specified giving the value range and the step (if not 1). The coding is done as follows (unless otherwise specified):

- Unsigned values are binary coded

- Signed values are coded with the 2's complement notation

8.2 Data frames

8.2.1 Introduction

The purpose of the user data frames is to transparently transport the transport blocks between Node B and Serving RNC.

The protocol allows for multiplexing of coordinated dedicated transport channels, with the same transmission time interval, onto one transport bearer.

The transport blocks of all the coordinated DCHs for one transmission time interval are included in one frame.

SRNC indicates the multiplexing of coordinated dedicated transport channels in the appropriate RNSAP/NBAP message.

8.2.2 Uplink data frame

The structure of the UL data frame is shown below.

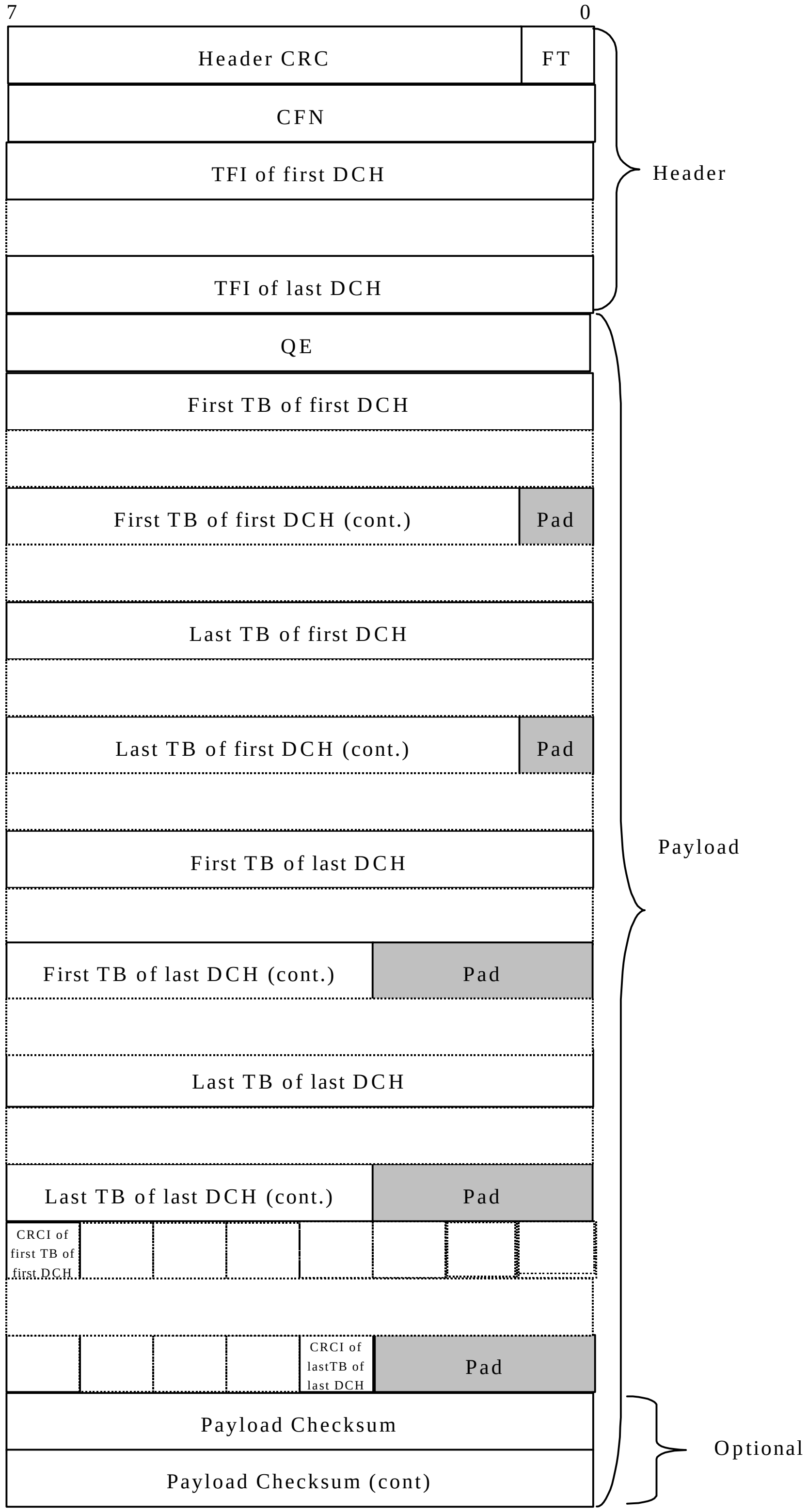

Figure 11: Uplink data frame structure

For the description of the fields see chapter 8.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport connection.

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

There is a CRCI for each TB included in the frame. If the CRC indicators of one data frame do not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure.

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setup of the transport connection).

8.2.3 Downlink data frame

The structure of the UL data frame is shown below.

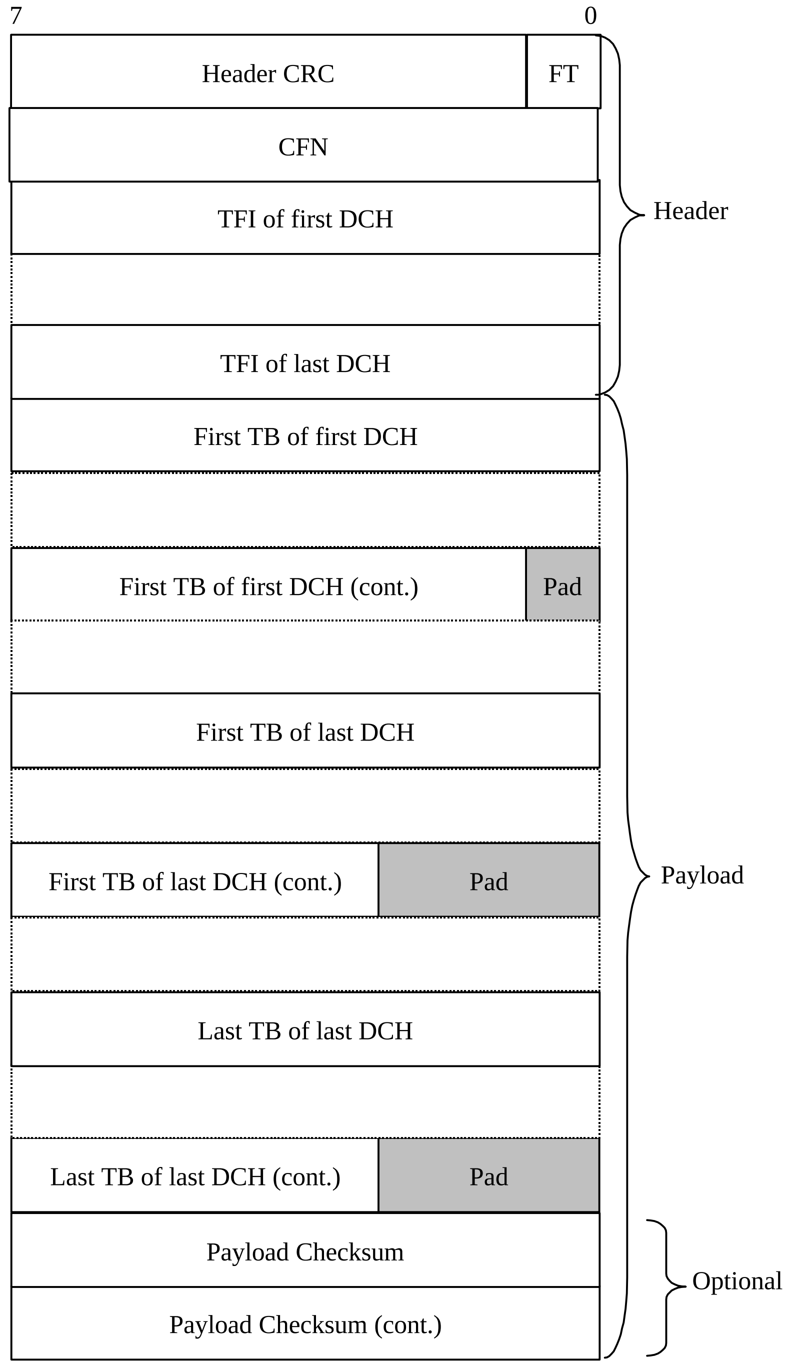

Figure 12: Downlink data frame structure

For the description of the fields see chapter 8.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport connection.

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setu p of the transport connection).

8.2.4 Coding of information elements in data frames

8.2.4.1 Header CRC

Description: Result of the CRC applied to the remaining part of the header, i.e. from bit 0 of the first byte, (the FT field) to the bit 0 (included) of the last byte of the header) with the corresponding generator polynomial: $G(D) = D^7+D^6+D^2+1$.
Field Length: 7 bits

8.2.4.2 Frame Type (FT)

Description: describes if it is a control frame or a data frame.
Value range: {0=data, 1=control}.
Field Length: 1 bit

8.2.4.3 Connection Frame Number (CFN)

Description: indicator as to which radio frame the first data was received on uplink or shall be transmitted on downlink. See reference [2].
Value range: {0-255}
Field length: 8 bits

8.2.4.4 Transport Format Indicator (TFI)

Description: TFI is the local number of the transport format used for the transmission time interval. For information about what the transport format includes see TS 25.302 reference [3].
Value range: {0-255}
Field length: 8 bits

8.2.4.5 Quality Estimate (QE)

Description: : The quality estimate is derived from the Physical Channel BER (see Ref. [25.302]) as follows:

$$QE = - Log_{10} (\textit{Physical channel BER})$$

The quality estimate is needed in order to select a transport block when all CRC indications are showing bad (or good) frame. The UL Outer Loop Power Control may also use the quality estimate.
Value range: {0-25.5}, granularity 0.1.
Field length: 8 bits

8.2.4.6 Transport Block (TB)

Description: A block of data to be transmitted or received over the air interface. The transport format indicated by the TFI describes the transport block length and transport block set size. See TS 25.302 reference [3].
Field length: the length of the TB is specified by the TFI.

8.2.4.7 CRC indicator (CRCI)

Description: It is the result of the air interface CRC checksum on the TB. Shows if the transport block has a correct CRC.
Value range: {0=Correct, 1=Not Correct}
Field length: 1 bit

8.2.4.8 Payload Cyclic Redundancy Checksum

Description: CRC for the payload. This field is optional. It is the result of the CRC applied to the remaining part of the payload, i.e. from the bit 7 of the first byte of the payload to the bit 0 of the byte of the payload before the CRC field, with the corresponding generator polynomial: $G(D) = D^{16}+D^{15}+D^{2}+1$.
Field length: 16 bits

8.3 Control frames

8.3.1 Introduction

Control Frames are used to transport control information between SRNC and Node B.
On the uplink, these frames are not combined – all frames are passed transparently from Node B to SRNC. On the downlink, the same control frame is copied and sent transparently to all the Node Bs from the SRNC.

The structure of the control frames is shown in the figure below:

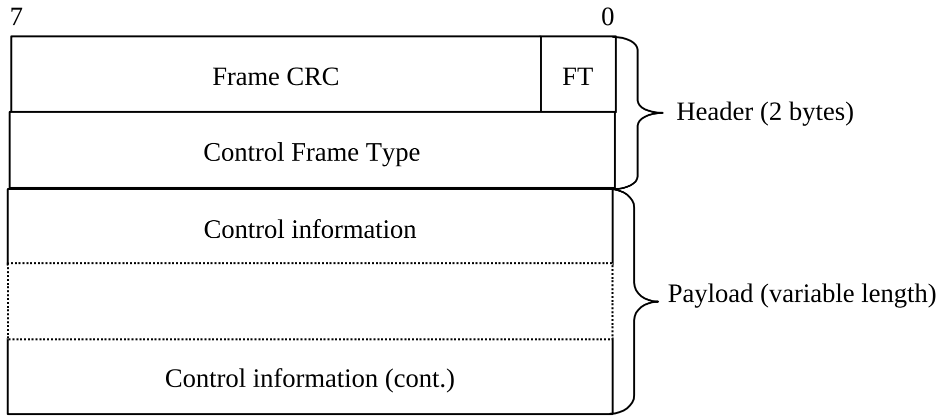

Figure 13: General structure of the control frames

Control Frame Type defines the type of the control frame.

The structure of the header and the payload of the control frames is defined in the following sections.

8.3.2 Header structure of the control frames

8.3.2.1 Frame CRC

Description: It is the result of the CRC applied to the remaining part of the frame, i.e. from bit 0 of the first byte of the header (the FT field) to bit 0 of the last byte of the payload, with the corresponding generator polynomial: $G(D) = D^{7}+D^{6}+D^{2}+1$.
Field Length: 7 bits

8.3.2.2 Frame Type (FT)

Description: describes if it is a control frame or a data frame.
Value range: {0=data, 1=control}.
Field Length: 1 bit

8.3.2.3 Control Frame Type

Description: Indicates the type of the control information (information elements and length) contained in the payload.
Value The values are defined in the following table:

Control frame type	Coding
Outer loop power control	0000 0001
Timing adjustment	0000 0010
DL synchronisation	0000 0011
UL synchronisation	0000 0100
DL signalling for DSCH	0000 0101
DL Node synchronisation	0000 0110
UL Node synchronisation	0000 0111
Rx Timing Deviation	0000 1000

Field length: 8 bits

8.3.3 Payload structure and information elements

8.3.3.1 Timing Adjustment

8.3.3.1.1 Payload structure

Figure below shows the structure of the payload when control frame is used for the timing adjustment.

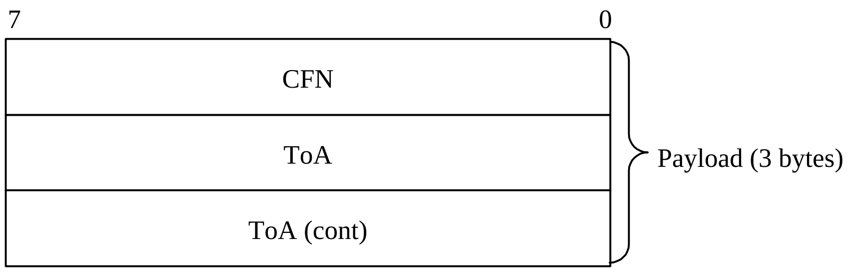

Figure 14: Structure of the payload for the Timing Adjustment control frame

8.3.3.1.2 CFN

The CFN value in the control frame is coded as in 8.2.4.3.

8.3.3.1.3 Time of arrival (ToA)

Description: time difference between the arrival of the DL frame with respect to TOAWE (based on the CFN value in the frame)
Value range: {-1280, +1270 msec, step 1 msec}.**Field length**: 16 bits

8.3.3.2 DL synchronisation

8.3.3.2.1 Payload structure

Figure below shows the structure of the payload when control frame is used for the user plane synchronisation.

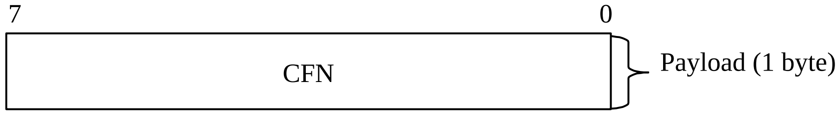

Figure 15: Structure of the payload for the DL synchronisation control frame

8.3.3.2.2 CFN

The CFN value in the control frame is coded as in 8.2.4.3.

8.3.3.3 UL synchronisation

8.3.3.3.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for the user plane synchronisation (UL).

Figure 16: Structure of the UL Synchronisation control frame

8.3.3.3.2 CFN

The CFN value in the control frame is coded as in 8.2.4.3.

8.3.3.3.3 Time of arrival (ToA)

See 8.3.3.1.3.

8.3.3.4 UL Outer loop power control

8.3.3.4.1 Payload structure

Figure below shows the structure of the payload when control frame is used for the UL outer loop power control.

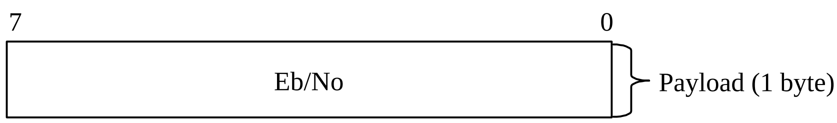

Figure 17: Structure of the payload for outer loop PC control frame

8.3.3.4.2 Eb/No setpoint

Description: Value (in dB) of the reference Eb/No to be used for the UL inner loop power control.
Value range: {0…25.5 dB}, step 0.1 dB
Field length: 8 bits

8.3.3.5 DL Node Synchronization

8.3.3.5.1 Payload structure

Figure below shows the structure of the payload for the DL Node Synchronisation control frame.

7 … 0	
T1	
T1 (cont)	Payload (3 bytes)
T1 (cont)	

Figure 18: Structure of the payload for the DL Node Synchronisation control frame

8.3.3.5.2 T1

Description: RNC specific frame number (RFN) that indicates the time when RNC sends the frame through the SAP to the transport layer.
Value range: as defined in 8.3.3.6.2.
Field length: 24 bits

8.3.3.6 UL Node Synchronization

8.3.3.6.1 Payload structure

The payload of the UL Node synch control frames is shown in the figure below.

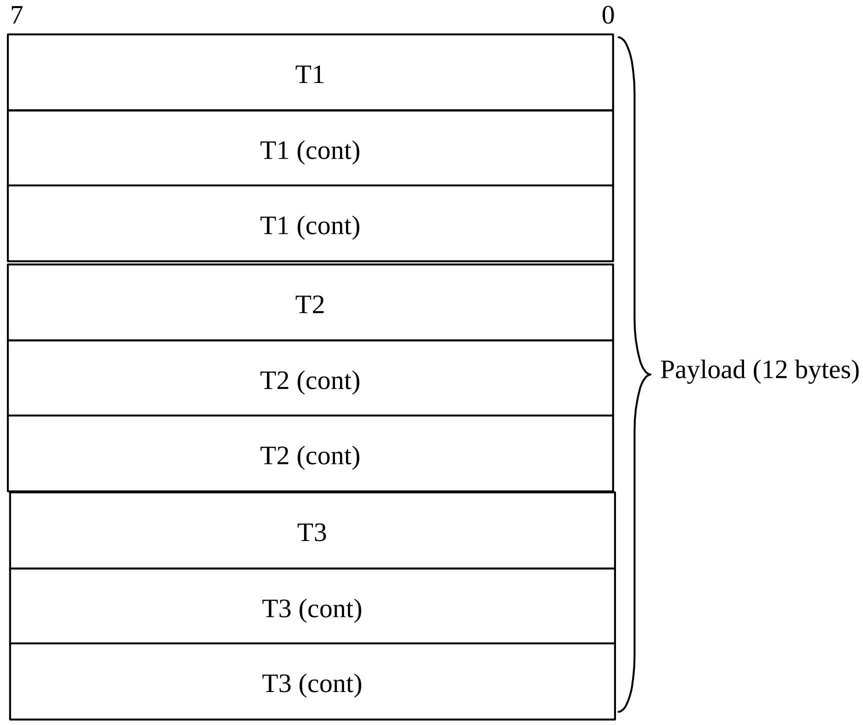

Figure 19: Structure of the payload for UL Node Synchronisation control frame

8.3.3.6.2 T1

Description: T1 timer is extracted from the correspondent DL synchronisation control frame.
Value range: 0-40959.875 ms, and the resolution is 0.125 ms.
Field length: 24 bits

8.3.3.6.3 T2

Description: Node B specific frame number (BFN) that indicates the time when Node B received the correspondent DL synchronisation frame through the SAP from the transport layer.
Value range: 0-40959.875 ms, and the resolution is 0.125 ms.
Field length: 24 bits

8.3.3.6.4 T3

Description: Node B specific frame number (BFN) that indicates the time when Node B sends the frame through the SAP to the transport layer.
Value range: 0-40959.875 ms, and the resolution is 0.125 ms.
Field length: 24 bits

8.3.3.7 Rx Timing Deviation

8.3.3.7.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for the Rx timing deviation.

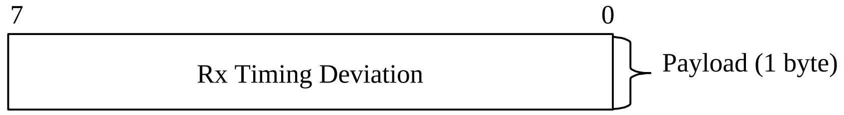

Figure 20: Structure of the payload for Rx timing deviation control frame

8.3.3.7.2 Rx Timing Deviation

Description: Measured Rx Timing deviation.
Value range: {-512, +508 chips, step 4 chips}. **Field length**: 8 bits

8.3.3.8 DSCH TFI signalling

8.3.3.8.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for signalling TFI bits used on the DSCH.

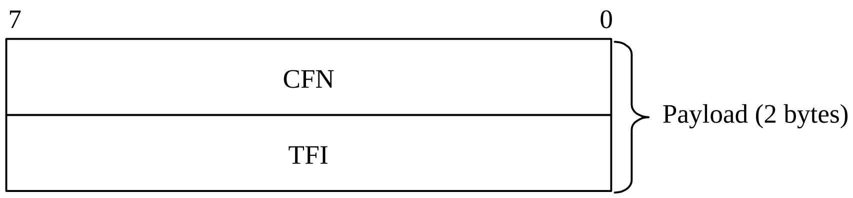

Figure 21: Structure of the payload for the DSCH DL signaling control frame.

8.3.3.8.2 DSCH TFI

Description: TFI of the associated DSCH TBS.
The DSCH TFI in the control frame is coded as in.8.2.4.4.

9 Handling of Unknown, Unforeseen and Erroneous Protocol Data

9.1 General

A Frame Protocol frame with illegal or not comprehended parameter value shall be ignored.

10 List of open issues

The open issues that may have impact on the FP specification are the following:

- Version handling and backward compatibility.
- Decoding of the UL TFCI and need of the UL normal mode.

11 History

Document history		
0.0.1	15.02.1999	Document Structure (proposal)
0.0.2	February 1999	Introduction of text from 'Merged Description of the Iub interface'
0.0.3	29.03.99	Initial list in chapter 7 reintroduced. Connection ID added in the UL and DL data frame structure.
0.1.0	15.03.1999	Approved by WG3
0.1.1	April 1999	Minor editorial changes
0.2.0	June 1999	Restructured and approved by WG3 #4.
0.2.1	June 1999	Major changes due to the discussion in WG3 #4 of documents R3-99451 and R3-99417 (Frame structure), R3-99518 (Silence detection), R3-99452 (Outer loop power control), R3-99535 (Timing adjustment). Assessment table added.
0.3.0	July 1999	Revisions proposed in version 2.1 are approved by WG3 #5.
0.3.1	July 1999	Changes from WG3 #5 discussion (details on the synchronisation procedures as in Tdocs R3-99663 and R3-99636).
0.4.0	August 1999	Revisions proposed in version 0.3.1 are approved by WG3 #6.
0.4.1	September 1999	Changes from WG3#6 discussion. Main: - Introduction of the bit level frame structures and definition of the parameters. - Introduction of the Node Synchronisation procedure and control frames - Removal of the silence detection, and clarification on the data tranfer - Removal of the streamlining mode - Introduction of the DSCH TFCI control frame
0.4.2	September 1999	Editor's proposal. Main work on the coding of the control frames.
0.5.0	September 1999	Version 0.4.2 is approved with comments from WG3#7. The structure of the document is changed as follows: • Description of the procedures is moved before the definition of the frame structures. • The bit level frame structure is followed by the definition of the coding of the information elements. • The coding of the control frame has been grouped in three chapters: header, payload for the UL, payload for the DL.
0.5.1	September 1999	Modifications accordingly to WG3#7 discussion. Main changes accordingly to Tdocs R3-99C09, C10, C12, C13, C96. Editor's proposals: • Coding of NAME, Eb/No, QE. • Removal of tail, and NAME inserted in the header of control frames • Text added to complete the description of the procedures and frame structure.

<table>
<tr><td>0.6.0</td><td>24th September 1999</td><td>Contains changes agreed during the review of the document on the Iub/Iur SWG. The non editorial changes are:
• Chapter with the handling of unknown, unforeseen and erroneous protocol data is added, with text.
• Stability table removed.
• New definition of the Eb/No setpoint (8 bits) and Quality Estimate.
• Description of the DSCH TFI Signalling procedure is added.</td></tr>
<tr><td>2.0.0</td><td>27th September 1999</td><td>Version approved by WG3 to be submitted to TSG RAN for approval. Minor changes from v.0.6.0:
• TFCI decoding added as an open issue.
• New headings added in the control frame chapter.</td></tr>
<tr><td colspan="3">Rapporteur for 3GPP RAN 25.427 is:</td></tr>
<tr><td colspan="3">Fabio Longoni
Nokia Telecommunications, Espoo

Tel.: +358 40 568 9884
Fax : +358 9 511 38452
Email : fabio.longoni @nokia.com</td></tr>
<tr><td colspan="3">This document is written in Microsoft Word 97.</td></tr>
</table>