

Agenda Item: 8.5
Source: Nokia
Title: **Editing to ZZ.13, DCH Frame Protocol Description**
Document for:

1 Introduction

This contribution proposes some editorial changes to Chapter 11.2.2 in Ref. /1/, accordingly to the following points:

1. Initial list in 11.2.2 about the parameters of the frame has been removed: the list was a starting assumption (as stated in the note) and now the structures of the frames are presented in dedicated chapters.
2. Remaining text in 11.2.2 is moved in 11.2.2.1.1, while the text in 11.2.2.1.1 is moved to 11.2.2
3. CFN and Timing Adjustment command is added in the frame structure. These parameters are defined in the text but are not shown in the frame structure
4. *Downlink* and *Uplink DCH Control Frame* structures are added. Control frames are defined in the text, but the frame structure is not present
5. Renaming of *Downlink(Uplink) DCH Transport channel frame* into *Downlink(Uplink) DCH Data Frame*

The changes are shown with revision marks in the next section.

The applicability of the contribution to the adopted 3GPP documents has to be checked after the merging process between technical specifications from the partner organisations.

2 Editing Proposal

11.2.2 Dedicated Channel Frame Protocol

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 [6]. 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 Transport channel related to one UE context that is communicated over a set of cells that are macro-diversity combined within Node B, is carried on one AAL2 connection. This means that there are as many AAL2 connections as Transport channels and User ports for that communication.

It is FFS whether unidirectional or bi-directional AAL2 connections are used.

The parameters to be included in the Iub frames to be transported between Node B and Serving RNC (i.e., they apply for Iur and Iub data stream) are:

~~1. User data – a block of user data.~~

~~1. Connection ID – used by soft combining function to identify multiple paths of the same call.~~

~~1. Quality Indication – used by soft combining function.~~

~~1. Length Indicator – used to allow different frame sizes and different user rates.~~

~~1. CRC – error check for the frame.~~

~~1. Rx power – indication of received power level in uplink only.~~

~~1. Frame Type – e.g. signalling or data.~~

~~1. CFN – the connection frame number is the indicator as to which radio frame the data should be transmitted / was received. It is also needed for synchronisation purposes in DL channel frames.~~

~~1. Timing adjustment command – needed for synchronisation purposes in UL channel frames.~~

[Note: This list of parameters is the starting assumption and not necessarily comprehensive.]

Two different message types are to be used for both the downlink and uplink DCH Transport Channel Frame protocol in the Iur and Iub interfaces.

- DCH data frame
- DCH control frame

The DCH control frame shall be used for inband signalling between SRNC and Node B in cases where the normal DCH data frame can not be utilised. The DCH control frame shall not carry any data targeted to or received from the air interface. Typical use for the DCH control frame would be synchronisation of the user plane and transport of DL outer loop power control commands.

11.2.2.1 Dedicated Channel Procedures

11.2.2.1.1 General

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interface. Typical use for the DCH control frame would be synchronisation of the user plane and transport of DL outer loop power control commands.

11.2.2.1.2 Downlink Transfer

11.2.2.1.2.1 Downlink DCH Data Frame

Every Transmission Time Period (typically one radio frame, i.e. 10ms), for each Transport channel, the SRNC provides to the Node B the following information:

- a Transport Block Set (user data) to be sent on the radio interface
- the Transport Format Indicator (TFI) to use
- The CFN to indicate in which radio frame the data shall be transmitted

The CID of the AAL2 frame identifies the Iub data stream where a Transport channel frame is transported.

Information element	Description
message type	Downlink DCH Transport channel Data frame
Transport Format Indicator	The TFI identifies the format of the transport channel to be used on the radio interface
CFN	<u>Indicator to which radio frame the data should be transmitted. It is also needed for synchronisation purposes</u>
Transport Block Set	This contains the data to be sent on the radio interface
Outer Loop Power Control (optional)	This may update the target outer loop power control

11.2.2.1.2.2 Downlink DCH Control Frame

Information element	Description
message type	Downlink DCH Control frame
CFN	<u>It is needed for synchronisation purposes</u>
Outer Loop Power Control (optional)	<u>This may update the target outer loop power control</u>

11.2.2.1.3 Uplink Transfer

11.2.2.1.3.1 Uplink DCH Data Frame

Every Transmission Time Period (typically one radio frame, i.e. 10ms), for each Transport channel, the Node B sends to the SRNC the following information:

- a Transport Block Set (user data) received from the radio interface
- the Transport Format Indicator (TFI) associated to the Transport Block Set
- A Quality indicator:
Bad / Good frame

Other Quality indications are FFS.

- The CFN to indicate in which radio frame the data shall be transmitted
- The timing adjustment command

When the frame is incorrectly received, it is not sent on the Iur interface.

Information element	Description
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message type	Uplink DCH Transport channel frame
Transport Format Indicator	The TFI identifies the format of the transport channel as received from the radio interface
CFN	<u>Indicator to which radio frame the data was received.</u>
Transport Bloc Set	This contains the data received from the radio interface
Quality indicator	This may update the target outer loop power control
<u>Timing adjustment command</u>	<u>Needed for synchronisation purposes</u>

11.2.2.1.3.2 Uplink DCH Control Frame

<u>Information element</u>	<u>Description</u>
message type	<u>Downlink DCH Control frame</u>
CFN	<u>It is needed for synchronisation purposes</u>
<u>Outer Loop Power Control (optional)</u>	<u>This may update the target outer loop power control</u>

11.2.2.2 Iur / Iub DCH Data Stream Synchronisation

To synchronise and keep the synchronisation of a DCH data stream SRNC includes a Connection Frame Number (CFN) to all DL DCH Transport channel frames. If there is no data to be transmitted to the UE via the DCH transport bearer then a special DL DCH Control frames can be sent instead of DL DCH data frames.

Upon reception of a DL DCH Transport channel frame, node B should evaluate the time difference between the optimal arrival time for the DL DCH Transport Channel frame to be transmitted in the indicated CFN and the actual measured arrival time of the DL DCH Transport channel frame.

According to the measured time difference, node B should set a proper value for the Timing adjustment command in the UL DCH transport channel frame. If there is no UL data to be transmitted to the SRNC via the DCH transport bearer then a special UL DCH Control frame can be sent.

(The initial value for the parameters is FFS)

3 References

/1/ UMTS ZZ.13 *Description of the Iub Interface*, from Editor (Lucent)