TSG-RAN Meeting #11
Palm Springs, CA, U.S.A., 13-16 March 2001

RP-010120

Title: **Agreed CRs to TS 25.425**

Source: **TSG-RAN WG3**

Agenda item: **5.3.3**

Tdoc_Num	Specification	CR_Num	Revision_Num	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Num
R3-010306	25.425	022	2	Corrections to 25.425 – Editor's proposal	F	agreed	3.3.0	3.4.0
R3-010926	25.425	024	3	Clarification of Iur RACH frame protocol	F	agreed	3.3.0	3.4.0
R3-010923	25.425	026	1	Clarification of Services expected from data transport	F	agreed	3.3.0	3.4.0
R3-010758	25.425	028		Handling of spare bits	F	agreed	3.3.0	3.4.0

3GPP TSG-RAN WG3 Meeting #18
Lidingo, Sweden, 15-19 January 2001

Tdoc 010306

CR-Form-v3

CHANGE REQUEST

⌘ **25.425** **CR** **022** ⌘ rev **R2** ⌘ Current version: **3.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Corrections to 25.425 – Editor's proposal
Source:	⌘	R-WG3
Work item code:	⌘	***Date:*** ⌘ 02 January 2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Some minor errors need to be corrected.
Summary of change:	⌘	- In clause 5.2.1, a flow chart for FACH Flow Control procedure has been added - In clause 5.2.3, "DSCH Flow Control frame" is replaced by "DSCH Capacity Allocation frame". - In clauses 6.3.2 and 6.3.3, references to subclauses have been updated. There is no backwards compatibility problems arising from these changes.
Consequences if not approved:	⌘	Some inconsistencies would remain in the specification.

Clauses affected:	⌘	5.2.1, 5.2.3, 6.3.2.2, 6.3.3.1.1, 6.3.3.1.2, 6.3.3.2.1, 6.3.3.2.2, 6.3.3.3.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

3G TS 25.425 V3.3.0 (2000-12)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN I_{ur} Interface User Plane Protocols for Common Transport Channel Data Streams (Release 1999)

Keywords

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Contents

Foreword

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

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document shall provide a description of the UTRAN RNS-RNS (Iur) interface user plane protocols for Common Transport Channel data streams as agreed within the TSG-RAN working group 3.

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.

[1] ITU-T Recommendation I.361 (11/95): "B-ISDN ATM Layer Specification".

[2] ITU-T Recommendation I.363.2 (9/97): "B-ISDN ATM Adaptation Layer type 2".

[3] ITU-T Recommendation I.366.1 (6/98): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL type 2".

[4] 3G TS 25.427: "Iub/Iur User Plane Protocols for DCH Data Streams".

[5] 3G TS 25.401: "UTRAN overall description".

[6] 3G TS 25.990: "UTRAN vocabulary".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Common Transport Channel: it is defined as a transport channel that is shared by several users i.e. DSCH, USCH [TDD], CPCH [FDD], RACH, FACH.

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

For other definitions, please refer to [5].

3.2 Symbols

No special symbols are defined in the present document.

3.3 Abbreviations

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

AAL2	ATM Adaptation Layer type 2
ATM	Asynchronous Transfer Mode
CFN	Connection Frame Number
CmCH	CoMmon transport Channel
CPCH	Common Packet Channel
CPS	Common Part Sublayer
C-RNC	Controlling Radio Network Controller
CRC	Cyclic Redundancy Checksum
DCH	Dedicated Transport Channel
DL	Downlink
D-RNTI	Drift RNTI
DSCH	Downlink Shared Channel
FACH	Forward Access CHannel
FP	Frame Protocol
FT	Frame Type
PC	Power Control
RACH	Random Access CHannel
RNC	Radio Network Controller
RNTI	Radio Network Temporary Identity
SRNC	Serving Radio Network Controller
S-RNTI	Serving RNTI
SSCS	Service Specific Convergence Sublayer
SSSAR	Service Specific Segmentation and Reassembly sublayer
TB	Transport Block
TBS	Transport Block Set
TFI	Transport Format Indicator
ToA	Time of arrival
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
U-RNTI	UTRAN RNTI
USCH	Uplink Shared Channel

4 General Aspects

4.1 Common Transport Channel Data Streams User Plane Protocol Services

This chapter describes the services that the User Plane Protocols provide such as data transfer, flow control.

4.1.1 RACH/CPCH[FDD] Data Streams User Plane Protocol Services

RACH/CPCH[FDD] frame protocol provides the following services:

- Transport of MAC-c/sh SDUs from the DRNC to the SRNC for RACH/CPCH[FDD] common transport channels.

4.1.2 FACH Data Streams User Plane Protocol Services

FACH frame protocol provides the following services:

- Transport of MAC-c SDUs from the SRNC to the DRNC for FACH common transport channel.

- Flow Control between MAC-d and MAC-c.

4.1.3 [TDD USCH]/DSCH Data Streams User Plane Protocol Services

[TDD USCH]/DSCH frame protocol provides the following services:

- Transport of MAC-c/sh SDUs between the SRNC and the DRNC for [TDD USCH] and DSCH common transport channels.
- Flow Control between MAC-d and MAC-c/sh.

4.2 Services expected from data transport

The following services are expected from the transport layer:

- In sequence delivery of Frame Protocol PDUs.

4.3 Protocol Version

This revision of the specification specifies version 1 of the protocols.

5 Common Transport Channel Data Streams User Plane Procedures

This chapter specifies the user plane procedures for Common Transport Channels data streams. Typical related scenarios at Iur interface should be described.

For the user plane of the radio network layer there are four Common Transport Channel frame handling protocols:

1. Random Access Channel/Common Packet Channel [FDD] Frame Protocol (RACH/CPCH[FDD] FP) for transport of Iur data streams carried on RACH/CPCH[FDD] on the Uu-interface.
2. Forward Access Channel Frame Protocol (FACH FP) for transport of Iur data streams carried on FACH on the Uu-interface.
3. Downlink Shared Channel Frame Protocol (DSCH FP) for transport of Iur data streams carried on DSCH on the Uu-interface.
4. Uplink Shared Channel Frame Protocol ([TDD USCH] FP) for transport of Iur data streams carried on USCH on the Uu-interface.

5.1 Data Transfer

5.1.1 RACH/CPCH[FDD] Data Transfer

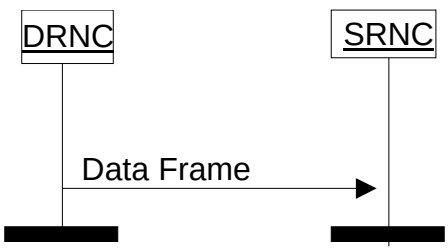


Figure 1: RACH/CPCH[FDD] data transfer

Data received on the RACH/CPCH[FDD] transport channel is transmitted from the DRNC to the SRNC using RACH/CPCH[FDD] data frames. The data is protected by a mandatory payload CRC. Multiple MAC-c/sh SDUs of same length may be transmitted in the same RACH/CPCH[FDD] data frame.

5.1.2 FACH data transfer

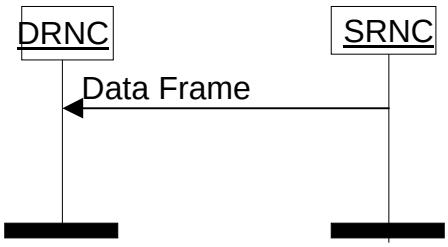


Figure 2: FACH data transfer

Data to be transmitted on the FACH transport channel is transmitted from the SRNC to the DRNC using FACH data frames. Multiple MAC-c/sh SDUs of same length and same priority (CmCH-PI) may be transmitted in the same FACH data frame. Within one priority and size the SDUs shall be transmitted by the DRNS on the Uu interface in the same order as they were received from the SRNC.

The *UE-ID Type Indicator* IE indicates which UE-ID type MAC-c/sh shall include in the MAC header.

5.1.3 USCH Data Transfer [TDD]

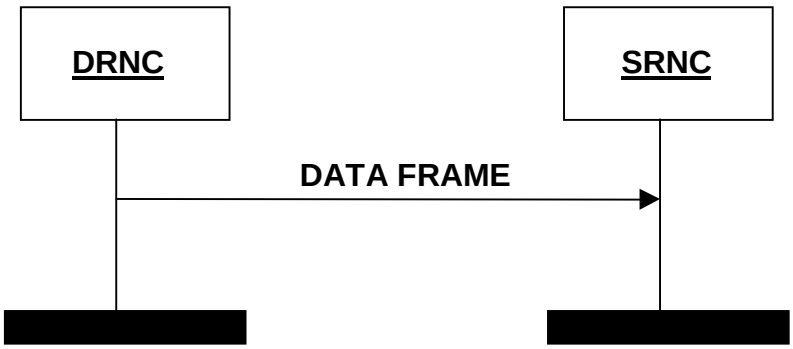


Figure 3: USCH Data transfer

Whenever there is USCH data in the DRNC, transfer is done immediately to the SRNC via the USCH Data Port using USCH Data Frames.

Data received on the USCH transport channel is transmitted from the DRNC to the SRNC using USCH data frames. The data is protected by a mandatory payload CRC. Multiple MAC-c/sh SDUs of same length may be transmitted in the same USCH data frame.

5.1.4 DSCH Data Transfer

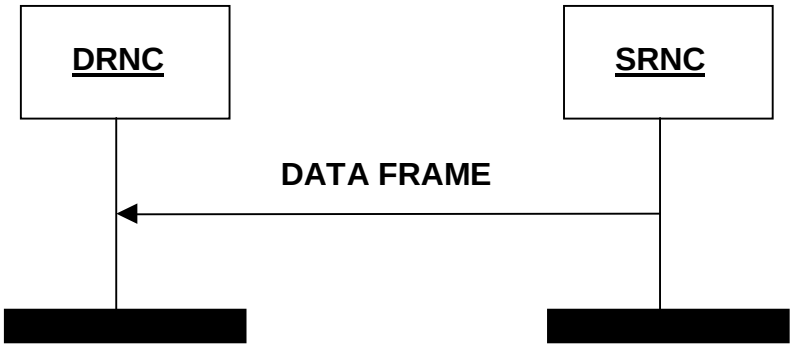


Figure 4: DSCH Data Transfer

When the SRNC has been granted capacity by the DRNC and the SRNC has data waiting to be sent, then the DSCH data frame is used to transfer the data. When data is waiting to be transferred, and a capacity allocation is received, a data frame will be transmitted immediately according to allocation received.

Multiple MAC-c/sh SDUs of same length and same priority (CmCH-PI) may be transmitted in the same DSCH data frame.

The DSCH data frame includes a user buffer size indication to indicate the amount of data pending for the respective UE and for the indicated priority level. Within one priority and size the SDUs shall be transmitted by the DRNS on the Uu interface in the same order as they were received from the SRNC.

5.2 Flow Control

5.2.1 FACH Flow Control

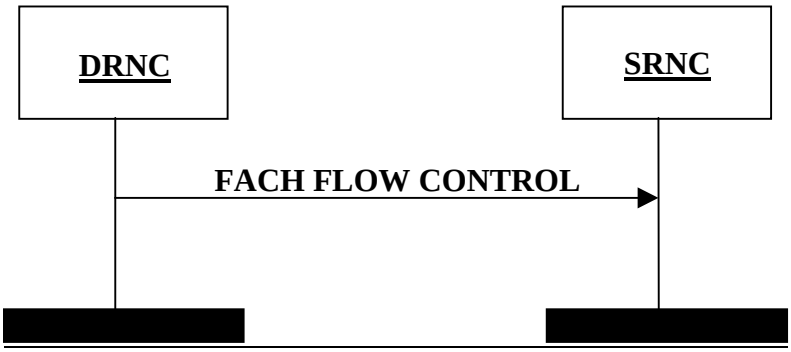


Figure 5: FACH Flow Control

The FACH flow control frame is used by the DRNC to control the user data flow. It may be generated in response to a FACH Capacity Request or at any other time. The *Credits* IE indicates the number of MAC-c/sh SDUs the SRNC is allowed to transmit for the UE identified by the *SRNTI* IE and the associated priority class indicated by the *Common Transport Channel Priority Indicator* IE.

The *Credits* IE indicates the total amount of credits granted. Any credits previously granted are withdrawn.

If *Credits* IE = 0 (e.g. due to congestion in the DRNC), the SRNC shall immediately stop transmission of MAC-c/sh SDUs.

Credits IE = 'unlimited' indicates that the SRNC may transmit an unlimited number of MAC-c/sh SDUs.

5.2.2 DSCH Capacity Request

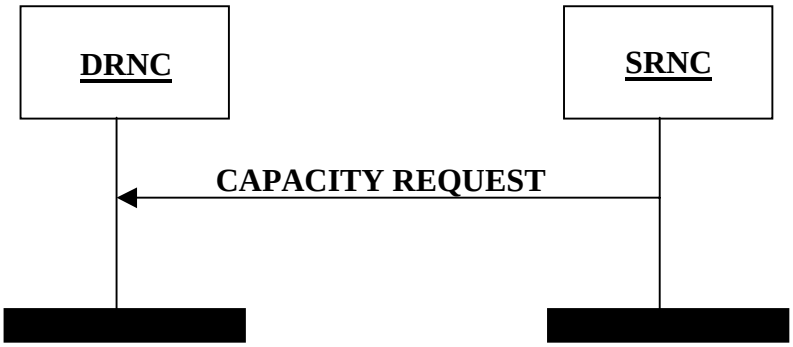


Figure 5: DSCH Capacity Request

The DSCH Capacity Request provides means for the SRNC to request DSCH capacity by indicating the user buffer size for a given priority level.

The SRNC is allowed to reissue the capacity request if no allocation has been received within an appropriate time threshold.

5.2.3 DSCH Capacity Allocation

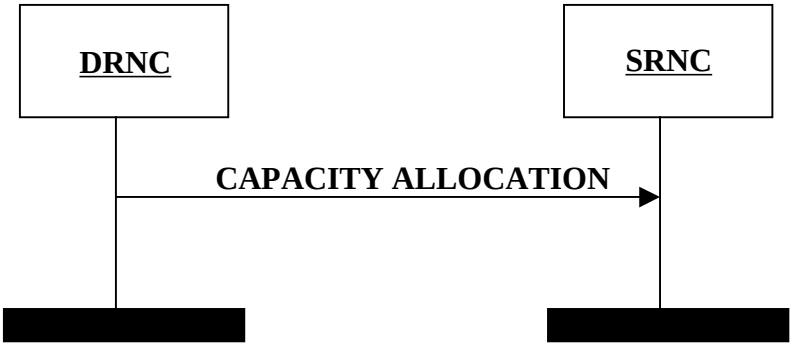


Figure 6: DSCH Capacity Allocation

DSCH Capacity Allocation is generated within the DRNC. It maybe generated either in response to a capacity request or at any other time.

The DRNC may use this message to modify the capacity at any time, irrespective of the reported user buffer status.

The DSCH Capacity Allocation ~~flow control~~ frame is used by the DRNC to control the user data flow. It indicates the number of MAC-c/sh SDUs the SRNC is allowed to transmit for the UE and the associated priority class indicated by the *Common Transport Channel Priority Indicator* IE.

The Max. *MAC c/sh SDU length*, *Credits*, *Interval* and *Repetition Period* IEs indicates the total amount of capacity granted. Any capacity previously granted is replaced.

If *credits* = 0 (e.g. due to congestion in the DRNC), the SRNC shall immediately stop transmission of MAC-c/sh SDUs. If *credits* = 255, the SRNC can transmit MAC-c/sh SDUs with unlimited capacity.

The IEs used are the *Common Channel Priority Indicator*, *Credits*, Max. *MAC c/sh SDU Length*, *Interval* and the *Repetition Count*.

If the 'Repetition Period' = 'unlimited' it indicates that the SRNC may transmit the specified number of MAC-c/sh SDUs for an unlimited period according to the bounds of *Maximum MAC-c/sh SDU length*, *Credits* and *Interval* IEs.

5.2.4 FACH Capacity Request

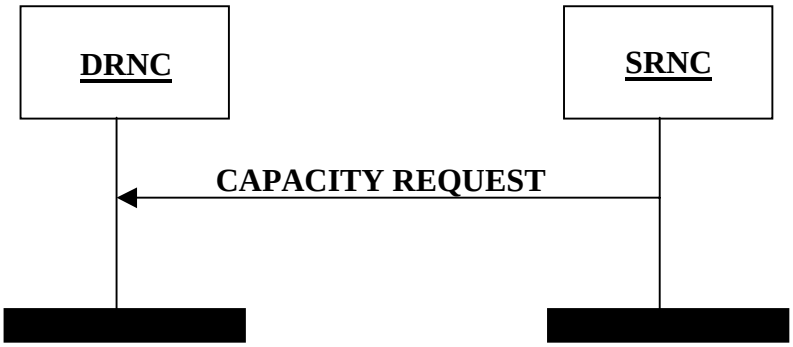


Figure 6A: FACH Capacity Request

The FACH Capacity Request provides the means for the SRNC to notify the DRNC about the user buffer size for a given priority class. It may be sent if no FACH Flow Control frame has been received within an appropriate time threshold, or to signal an event such as data arrival or user buffer discard.

6 Frame Structure and Coding

6.1 General

The general structure of a Common Transport Channel frame consists of a header and a payload. This structure is depicted in the figure 7:

Header	Payload: Data or Control Information

Figure 7: General Frame Structure

The header shall contain the frame type field and information related to the frame type.

There are two types of frames (indicated by the Frame Type field).

1. Data frame
2. Control frame

In this specification the structure of frames will be specified by using pictures similar to the following figure 8:

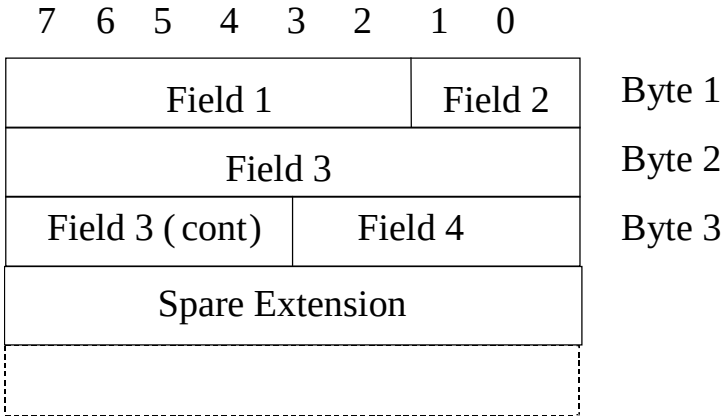


Figure 8: Example frame structure

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 picture 1). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in picture 1).

On the 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 Spare Extension indicates the location where new IEs can in the future be added in a backward compatible way.

The Spare Extension shall not be used by the transmitter and shall be ignored by the receiver.

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

- Lowest value (in the range) coded as a sequence of 0's;
- Highest value in the range coded as a sequence of 1's.

6.2 Data frame structure

6.2.1 RACH/CPCH[FDD] Channels

RACH/CPCH[FDD] Iur data stream corresponds to the data stream of one specific UE. The used transport bearer for the transport of FACH/RACH or FACH/CPCH[FDD] is bi-directional.

The RACH/CPCH[FDD]/FACH FP does not facilitate multiplexing of data streams from different UEs onto the same data frame, but does allow multiple UEs to share the same transport bearer.

The RACH Data frame structure is defined as common for FDD and TDD with conditional fields, and CPCH[FDD] Data frame structure is defined as common for FDD only.

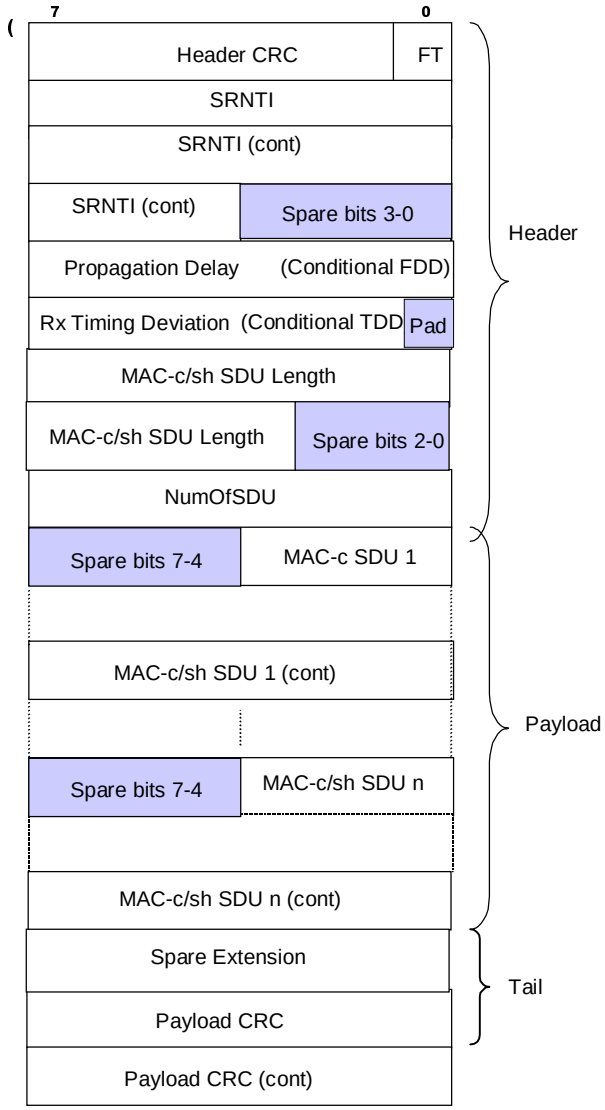


Figure 9: RACH/CPCH[FDD] Data Frame structure

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH/CPCH[FDD] Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a TDD Cell.

Spare bits shall be set to 0 and ignored by the receiver.

6.2.2 FACH Channels

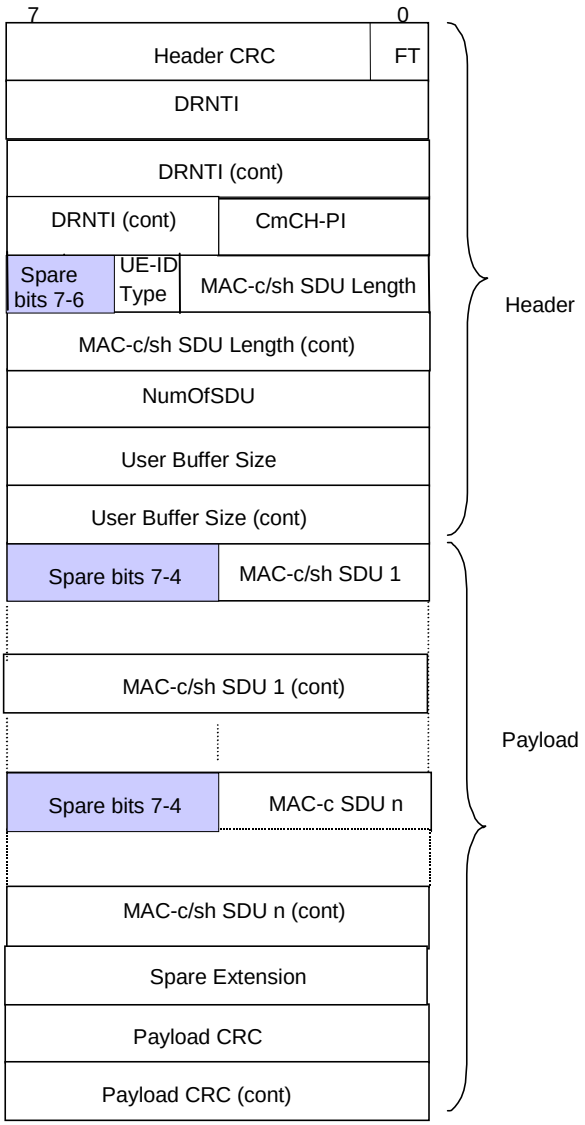


Figure 10: FACH Data Frame structure

Spare bits shall be set to 0 and ignored by the receiver.

6.2.3 USCH Data Frames [TDD]

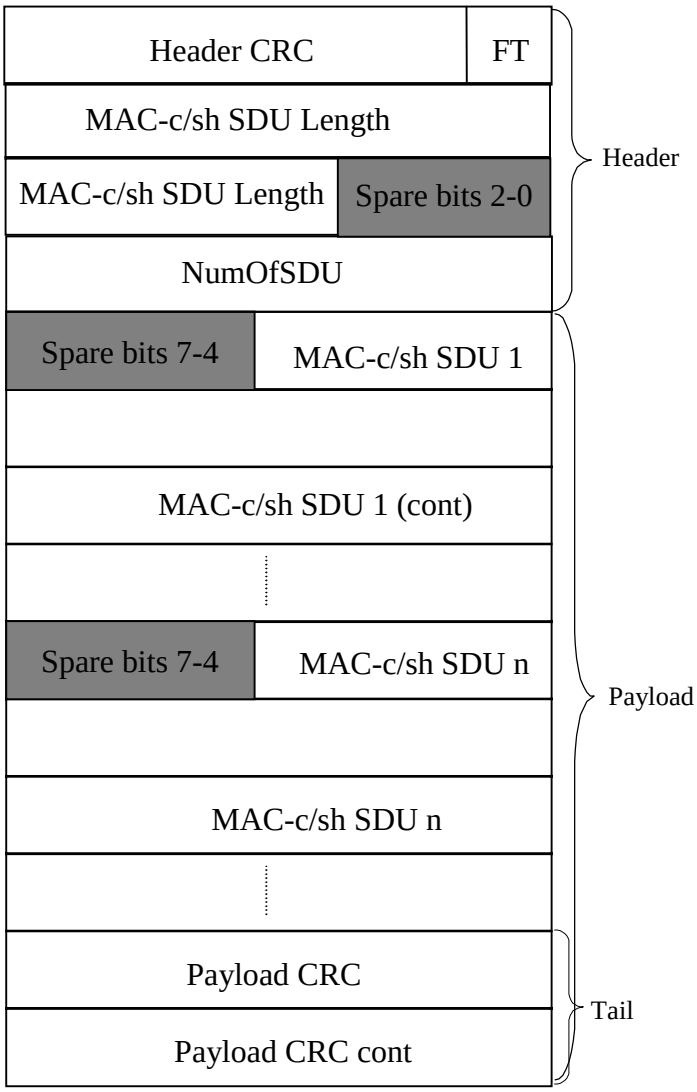


Figure 11: USCH Data Frame on the Iur

6.2.4 DSCH Data Frames

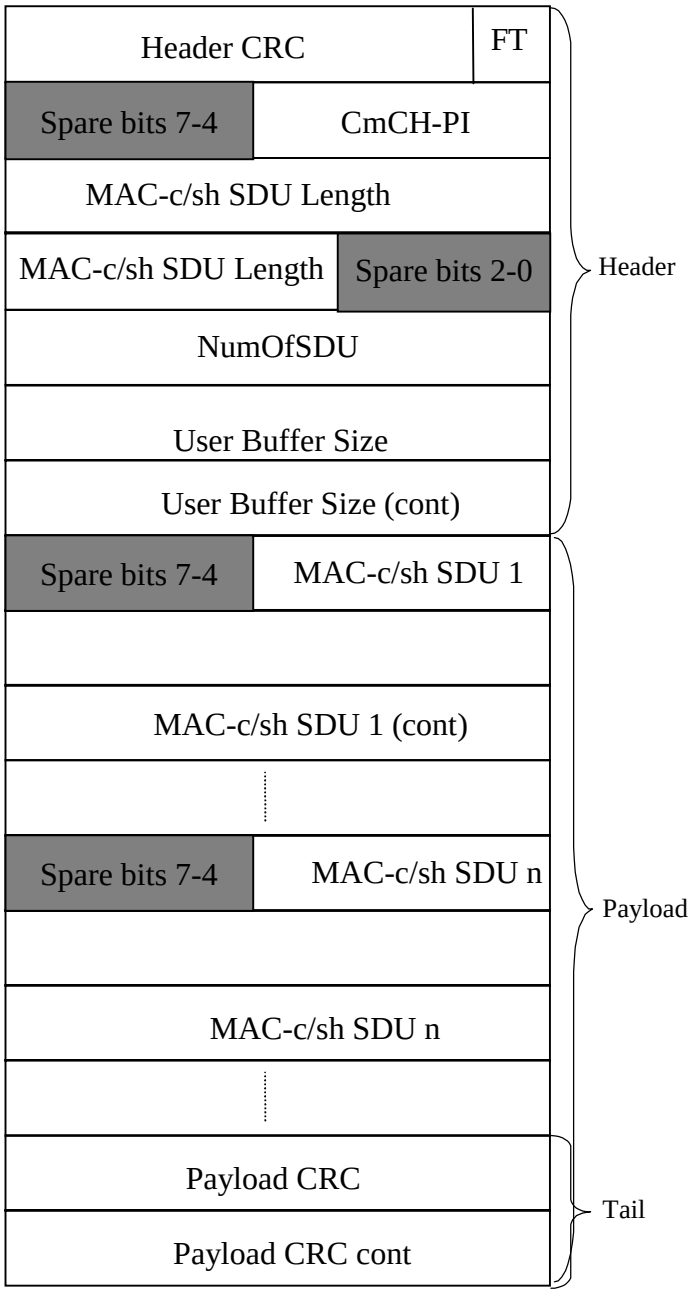


Figure 12: DSCH Iur Data Frame Structure

6.2.5 Coding of information elements in data frames

6.2.5.1 Header CRC

Description: Cyclic Redundancy Polynomial calculated on the header of a data frame with polynomial X^7+X^6+X^2+1. The CRC calculation shall cover all bits in the header, starting from bit 0 in the first byte (FT field) up to the end of the header.

Value range: {0-127}.

Field length: 7 bits.

6.2.5.2 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.

6.2.5.3 DRNTI

Description: Identifies the UE in the DRNC.

Value range: {0-1048575}.

Field length: 20 bits.

6.2.5.4 S-RNTI

Description: S-RNTI is defined in [5]. S-RNTI is used in UL control frames to identify the UE context in the SRNC.

Value range: {0-1048575}.

Field length: 20 bits.

6.2.5.5 UE-ID Type Indicator (UE-ID Type)

Description: Indicates the UE Identifier Type to be included by MAC-c/sh in the MAC header.

Value range: {0=U-RNTI, 1=C-RNTI}.

Field Length: 1 bit.

6.2.5.6 S-CCPCH Indicator (S-CI)

Void.

6.2.5.7 Common Transport Channel Priority Indicator (CmCH-PI)

Description: CmCH-PI is the relative priority of the data frame and the SDUs included.

Value range: {0-15, where 0=lowest priority, 15=highest priority}.

Field length: 4 bits.

6.2.5.8 MAC-c/sh SDU Length

Description: The value of that field indicates the length of every MAC-c/sh SDU in the payload of the FACH, DSCH and [TDD USCH] data frame in number of bits.

Value range: {0-5000}.

Field Length: 13 bits.

6.2.5.9 NumOfSDU

Description: Indicates the number of MAC-c SDUs in the payload.

Value range: {1-255}.

Field Length: 8 bits.

6.2.5.10 [FDD - Propagation delay]

Description: One-way air interface delay as measured during RACH access.

Value range: {0 - 765 chips}.

Granularity: 3 chips.

Field length: 8 bits.

6.2.5.11 [TDD - Rx Timing Deviation]

Description: Measured Rx Timing Deviation as a basis for timing advance.

Value range: {-256, ..., +256} chips

{N*4 - 256} chips ≤ RxTiming Deviation < {(N+1)*4 - 256} chips

With N = 0, 1, ...,127

Granularity: 4 chips.

Field length: 7 bits.

6.2.5.12 User Buffer Size

Description: Indicates the users' buffer size (i.e. the amount of data in the buffer) in octets for a given Common Transport Channel Priority.

Value range: {0-65535}.

Field length: 16 bits.

6.2.5.13 MAC-c/sh SDU

Description: A MAC-c/sh SDU contains the C/T field of the MAC header followed by one RLC PDU.Field length: See the value of the MAC-c/sh SDU Length IE.

6.2.3.14 Payload CRC

Description: Cyclic Redundancy Polynomial calculated on the payload of a data frame with polynomial X^16+X^15+X^2+1. The CRC calculation shall cover all bits in the data frame payload, starting from bit 7 in the first byte up to bit 0 in the byte before the payload CRC.

Field length: 16 bits.

6.2.5.15 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-2 octets.

6.3 Control frame structure

6.3.1 Introduction

Control Frames are used to transport control information between SRNC and DRNC.

The figure below defines the Control Frame structure for common transport channels.

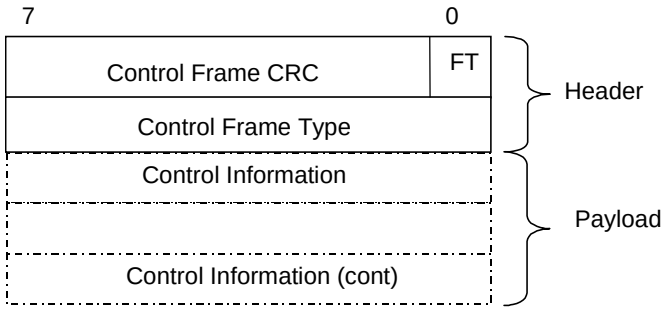


Figure 13: Iur Common Transport Channel Control Frame Format

The *Control Frame Type* IE defines the type of the control frames.

The length of the payload is variable accordingly to the control frame type.

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

6.3.2 Header structure of the control frames

6.3.2.1 Control frame CRC

Description: Cyclic Redundancy Polynomial calculated on a control frame with polynomial X^7+X^6+X^2+1. The CRC calculation shall cover all bits in the control frame, starting from bit 0 in the first byte (FT field) up to the end of the control frame.

Value range: {0-127}.

Field length: 7 bits.

6.3.2.2 Frame type (FT)

Refer to subclause 6.2.5~~3~~.2.

6.3.2.3 Control Frame Type

Description: Indicates the type of the control information (information elements and length) contained in the payload (=type of control frame).

Value: values of the *Control Frame Type* IE parameter are defined in the following table 1:

Table 1: Control Frame Type

Type of control frame	Value
FACH Flow Control	0000 0010
FACH Capacity Request	0000 0011
DSCH Capacity Request	0000 0100
DSCH Capacity Allocation	0000 0101

6.3.3 Payload structure and information elements

6.3.3.1 FACH Flow Control

Figure 14 shows the payload structure when the control frame is used for the above mentioned purpose. This control information is sent in the UL only.

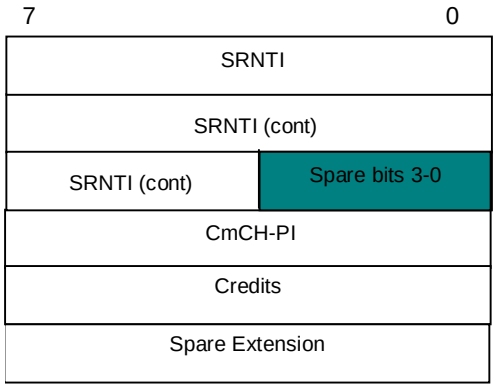


Figure 14: FACH Flow Control Payload structure

6.3.3.1.1 S-RNTI

Refer to subclause 6.2.5~~3~~.4.

6.3.3.1.2 Common Transport Channel Priority Indicator (CmCH-PI)

Refer to subclause 6.2.5.7~~3.6~~.

6.3.3.1.3 Credits

Description: The Credits IE indicates the number of MAC-c/sh SDUs that a user may transmit.

Value range: {0-255, where 0=stop transmission, 255=unlimited}.

Field length: 8 bits.

6.3.3.1.4 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

6.3.3.2 DSCH Capacity Request

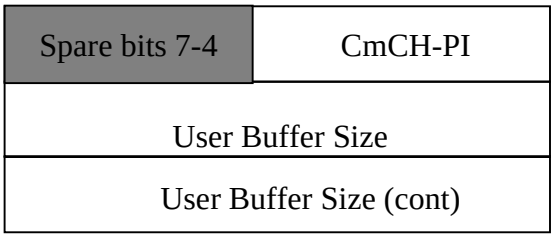


Figure 15: Capacity Request Control Frame

DSCH Capacity Request is sent for each priority group to indicate the user buffer size. The control frame is sent by the SRNC when the SRNC considers the user buffer status needs an increased buffer reporting frequency. This may be sent to signal an event, such as, data arrival or user-buffer discard. This control frame is used to improve user-buffer reporting above the level produced by the user-buffer reporting associated with the DSCH data frames.

6.3.3.2.1 Common Transport Channel Priority Indicator (CmCH-PI)

Refer to subclause 6.2.~~3.6~~5.7.

6.3.3.2.2 User Buffer Size

Refer to subclause 6.2.~~3.11~~5.12.

6.3.3.3 DSCH Capacity Allocation

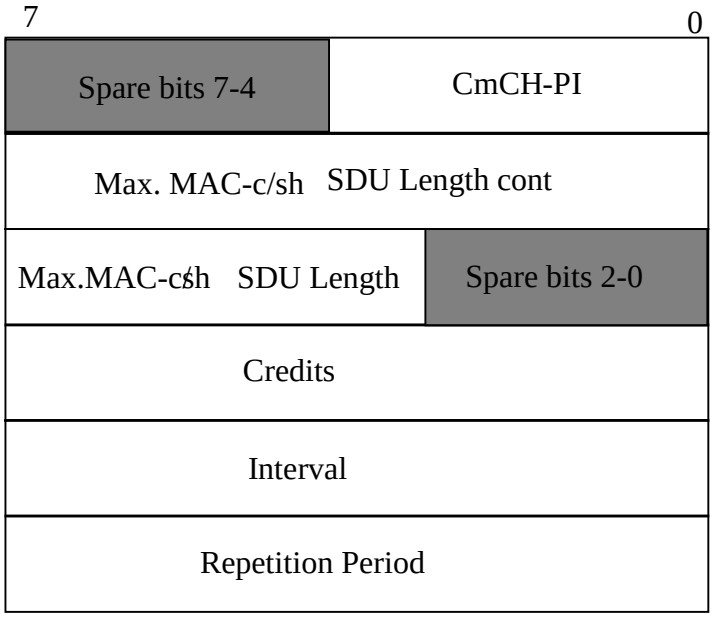


Figure 16: Capacity Allocation Control Frame

This message describes an allocation that the SRNC may use. When the credits has a value of 0 it signifies that there is no resources allocated. When the credits has a value of 255, it signifies unlimited capacity. When the repetition period has a value of 0, it signifies that the allocation (Max. MAC-c/sh SDU Length, Credits and Interval) can be repeated without limit.

6.3.3.3.1 Common Transport Channel Priority Indicator (CmCH-PI)

Refer to subclause 6.2.5.7~~3.6~~.

6.3.3.3.2 Maximum MAC-c/sh SDU Length

Description: The values indicated the maximum allowable SDU size. MAC-c/sh SDU contains the C/T field of the MAC header followed by one RLC PDU.Field length: See the value of the MAC-c/sh SDU Length IE.

6.3.3.3.3 Credits

Refer to subclause 6.3.3.1.3.

6.3.3.3.4 Interval

Description: The value of this field indicates the time interval during which the (Credits) granted in the DSCH Capacity Allocation frame may be transmitted. This value is only applied to the DSCH channel.

Value range: {0-2550 ms}.

Granularity: 10ms.

Field Length: 8 bits.

6.3.3.3.5 Repetition Period

Description: The value of this field indicates the number of subsequent intervals that the (Credits) granted in the DSCH capacity allocation may be transmitted. These values represent an integer number of Intervals (see 6.3.3.3.4). This field is only applied to the DSCH channel.

Value range: {0-255, where 0= unlimited repetition period}.

Field Length: 8 bits.

6.3.3.4 FACH Capacity Request

Figure 17 shows the payload structure when the control frame is used for the above mentioned purpose. This control information is sent in the DL only.

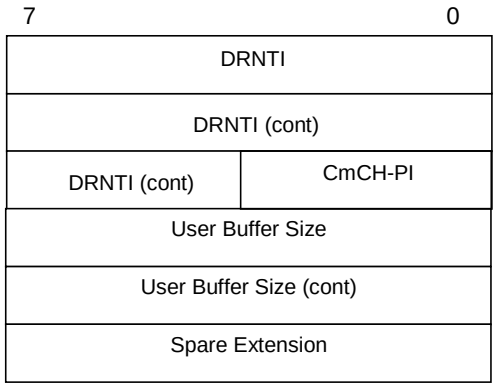


Figure 17: FACH Capacity Request Control Frame

6.3.3.4.1 DRNTI

Refer to subclause 6.2.5.3.

6.3.3.4.2 Common Transport Channel Priority Indicator (CmCH-PI)

Refer to subclause 6.2.5.7.

6.3.3.4.3 User Buffer Size

Refer to subclause 6.2.5.12.

6.3.3.4.4 Spare extension

Refer to subclause 6.3.3.14.

7 Handling of Unknown, Unforeseen and Erroneous Protocol Data

7.1 General

A Frame Protocol frame with an unknown IE or an illegal IE value shall be ignored.

Annex A (informative): Change history

Change history					
TSG RAN#	Version	CR	Tdoc RAN	New Version	Subject/Comment
RAN_06	-	-	RP-99757	3.0.0	Approved at TSG RAN #6 and placed under Change Control
RAN_07	3.0.0	-	-	3.1.0	Approved at TSG RAN #7
RAN_08	3.1.0	-	RP-000246	3.2.0	Approved at TSG RAN #8
RAN_10	3.2.0	018 019 021	RP-000623	3.3.0	Approved at TSG RAN #10

3GPP TSG-RAN WG3 Meeting #18
Cardiff, UK, 26 February - 2 March, 2001

Tdoc R3-010926

CR-Form-v3

CHANGE REQUEST

⌘ **25.425** **CR** **24** ⌘ rev **3** ⌘ Current version: **3.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of Iur RACH frame protocol
Source:	⌘	R-WG3
Work item code:	⌘	***Date:*** ⌘ January 2001
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	There is some ambiguity in the RACH frame because only the RX Timing Deviation is conditional in the octet, not the padding field. Therefore it is not completely clear that the entire octet is not present in an FDD RACH frame. In addition the bit order is in error compared with the same field in the Iub RACH data frame
Summary of change:	⌘	The frame diagram is modified to make it clear that the entire octet is conditional Also modified location of spare bits to be inline with Iub RACH frame
Consequences if not approved:	⌘	If this CR was not approved an ambiguity would still exist. Backward Compatibility Since this CR fixes a mistake in the bit order and removes an ambiguity it is not backward compatible.

Clauses affected:	⌘	6.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

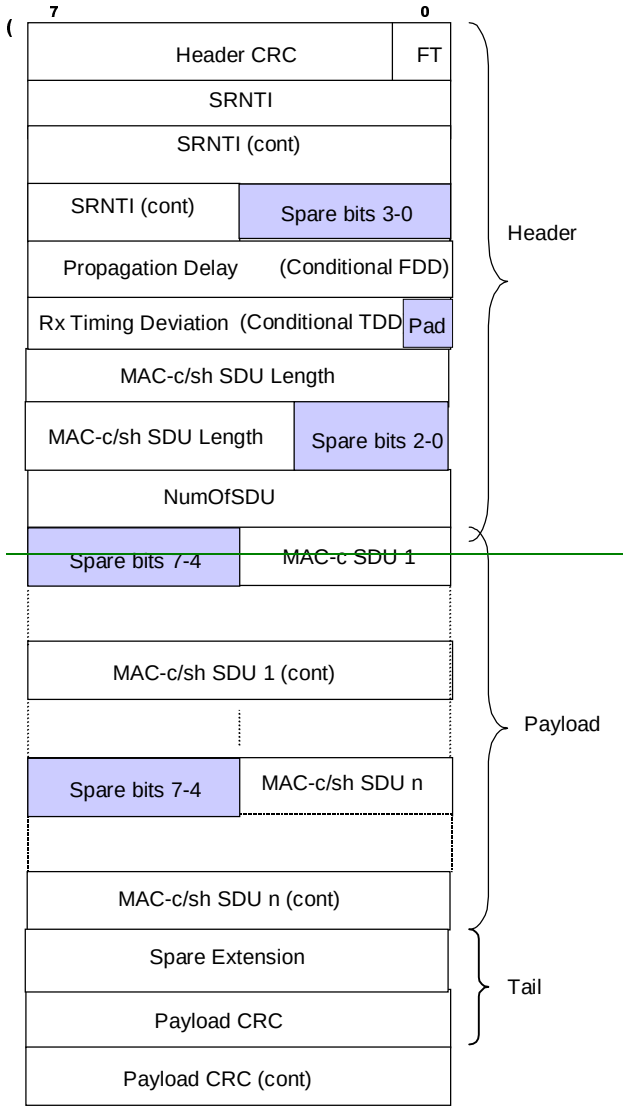
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.2.1 RACH/CPCH[FDD] Channels

RACH/CPCH[FDD] Iur data stream corresponds to the data stream of one specific UE. The used transport bearer for the transport of FACH/RACH or FACH/CPCH[FDD] is bi-directional.

The RACH/CPCH[FDD]/FACH FP does not facilitate multiplexing of data streams from different UEs onto the same data frame, but does allow multiple UEs to share the same transport bearer.

The RACH Data frame structure is defined as common for FDD and TDD with conditional fields, and CPCH[FDD] Data frame structure is defined as common for FDD only.


7
0
Header CRC
FT
SRNTI
SRNTI (cont)
SRNTI (cont)
Spare bits 3-0
Propagation Delay
(Conditional FDD)
Rx Timing Deviation (Conditional TDD
Pad
MAC-c/sh SDU Length
MAC-c/sh SDU Length
Spare bits 2-0
NumOfSDU
Spare bits 7-4
MAC-c SDU 1
MAC-c/sh SDU 1 (cont)
Spare bits 7-4
MAC-c/sh SDU n
MAC-c/sh SDU n (cont)
Spare Extension
Payload CRC
Payload CRC (cont)
Header
Payload
Tail

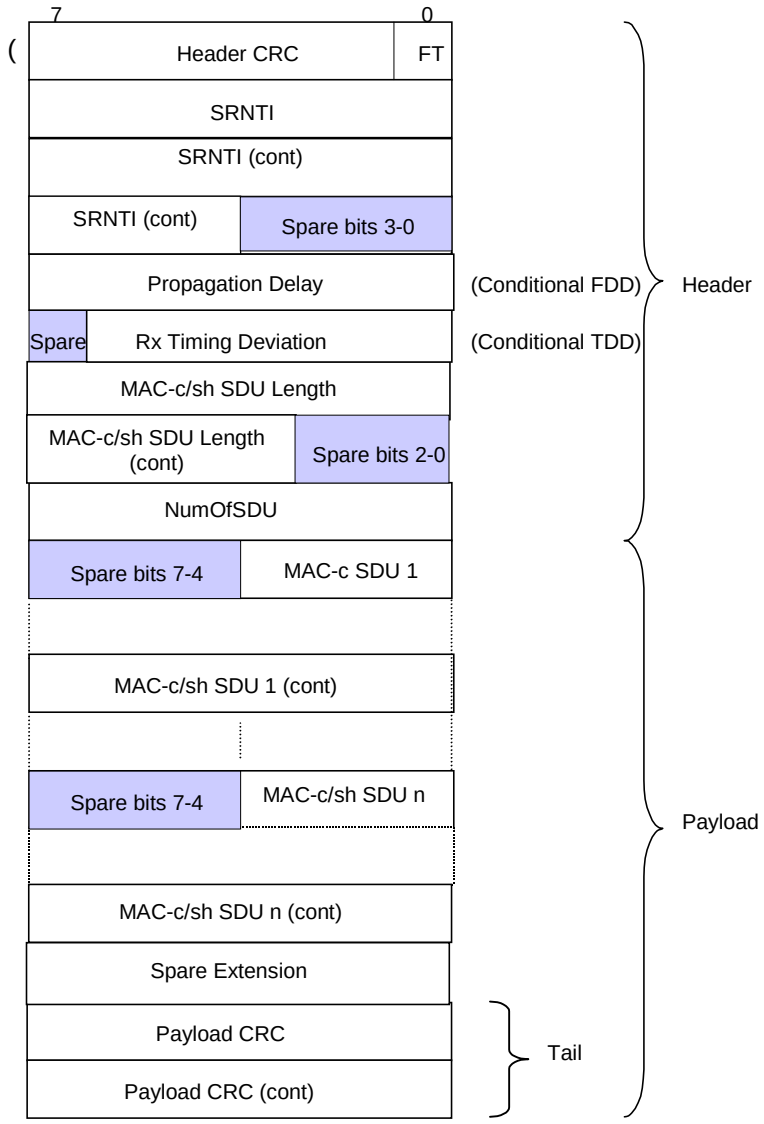


Figure 9: RACH/CPCH[FDD] Data Frame structure

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH/CPCH[FDD] Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a TDD Cell.

Spare bits shall be set to 0 and ignored by the receiver.

3GPP TSG-RAN3 Meeting #19
Cardiff, UK, 26 February - 2 March, 2001

Tdoc R3-010923

CR-Form-v3

CHANGE REQUEST

⌘ **25.425** **CR** **26** ⌘ re **1** ⌘ Current version: **3.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification of Services expected from data transport
Source:	⌘	R-WG3
Work item code:	⌘	***Date:*** ⌘ February 2001
Category:	⌘	**F** ***Release:*** ⌘ Release 99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Removal of unnecessary restriction on the Transport Network Layer according to the discussion in R3-010424.
Summary of change:	⌘	The services expected from the transport layer are modified. Infrequent Out-of-sequence delivery is permitted. Rev1: Text modified
Consequences if not approved:	⌘	Unnecessary constraints on the transport network layer limit the independent evolution of RNL and TNL for future releases. Backward compatibility: Since the protocol specification is unchanged, the modifications are essentially backward compatible. However, the changes may not be backward compatible on implementations that relied on the unnecessary requirements on the TNL.

Clauses affected:	⌘	4.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 General Aspects

4.1 Common Transport Channel Data Streams User Plane Protocol Services

This chapter describes the services that the User Plane Protocols provide such as data transfer, flow control.

4.1.1 RACH/CPCH[FDD] Data Streams User Plane Protocol Services

RACH/CPCH[FDD] frame protocol provides the following services:

- Transport of MAC-c/sh SDUs from the DRNC to the SRNC for RACH/CPCH[FDD] common transport channels.

4.1.2 FACH Data Streams User Plane Protocol Services

FACH frame protocol provides the following services:

- Transport of MAC-c SDUs from the SRNC to the DRNC for FACH common transport channel.
- Flow Control between MAC-d and MAC-c.

4.1.3 [TDD USCH]/DSCH Data Streams User Plane Protocol Services

[TDD USCH]/DSCH frame protocol provides the following services:

- Transport of MAC-c/sh SDUs between the SRNC and the DRNC for [TDD USCH] and DSCH common transport channels.
- Flow Control between MAC-d and MAC-c/sh.

4.2 Services expected from data transport

The following services are expected from the transport layer:

- ~~In sequence d~~Delivery of Frame Protocol PDUs.

In sequence delivery is not required. However, frequent out-of-sequence delivery may impact the performance and should be avoided.

4.3 Protocol Version

This revision of the specification specifies version 1 of the protocols.

3GPP TSG-RAN WG3 Meeting #19 ***R3-010758***
Cardiff, UK, February 26th – March 2nd , 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.425** **CR** **028** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Handling of spare bits
Source:	⌘	R-WG3
Work item code:	⌘	***Date:*** ⌘ February 2001
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The clarification how to handle spare bits is missing in the specification for other frames than RACH/CPCH and FACH.
Summary of change:	⌘	A clarification to describe how the transmitter and receiver shall handle spare bits is added to 'General' chapter to clearly relate the description to all frames in the specification. The clarification is removed from the RACH/CPCH and FACH frames.
Consequences if not approved:	⌘	Missing clarification may cause misunderstandings in a multivendor environment. The correction is backward compatible.

Clauses affected:	⌘	6.1, 6.2.1, 6.2.2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
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downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6 Frame Structure and Coding

6.1 General

The general structure of a Common Transport Channel frame consists of a header and a payload. This structure is depicted in the figure 7:

Header	Payload: Data or Control Information

Figure 7: General Frame Structure

The header shall contain the frame type field and information related to the frame type.

There are two types of frames (indicated by the Frame Type field).

1. Data frame
2. Control frame

In this specification the structure of frames will be specified by using pictures similar to the following figure 8:

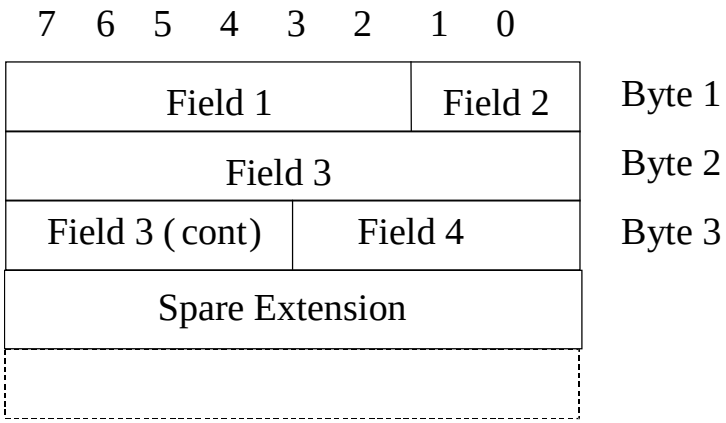

Figure 8: Example frame structure

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 picture 1). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in picture 1).

On the 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 Spare Extension indicates the location where new IEs can in the future be added in a backward compatible way.

The Spare Extension shall not be used by the transmitter and shall be ignored by the receiver.

Spare bits shall be set to 0 by the transmitter and shall be ignored by the receiver.

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

- Lowest value (in the range) coded as a sequence of 0's;
- Highest value in the range coded as a sequence of 1's.

6.2 Data frame structure

6.2.1 RACH/CPCH[FDD] Channels

RACH/CPCH[FDD] Iur data stream corresponds to the data stream of one specific UE. The used transport bearer for the transport of FACH/RACH or FACH/CPCH[FDD] is bi-directional.

The RACH/CPCH[FDD]/FACH FP does not facilitate multiplexing of data streams from different UEs onto the same data frame, but does allow multiple UEs to share the same transport bearer.

The RACH Data frame structure is defined as common for FDD and TDD with conditional fields, and CPCH[FDD] Data frame structure is defined as common for FDD only.

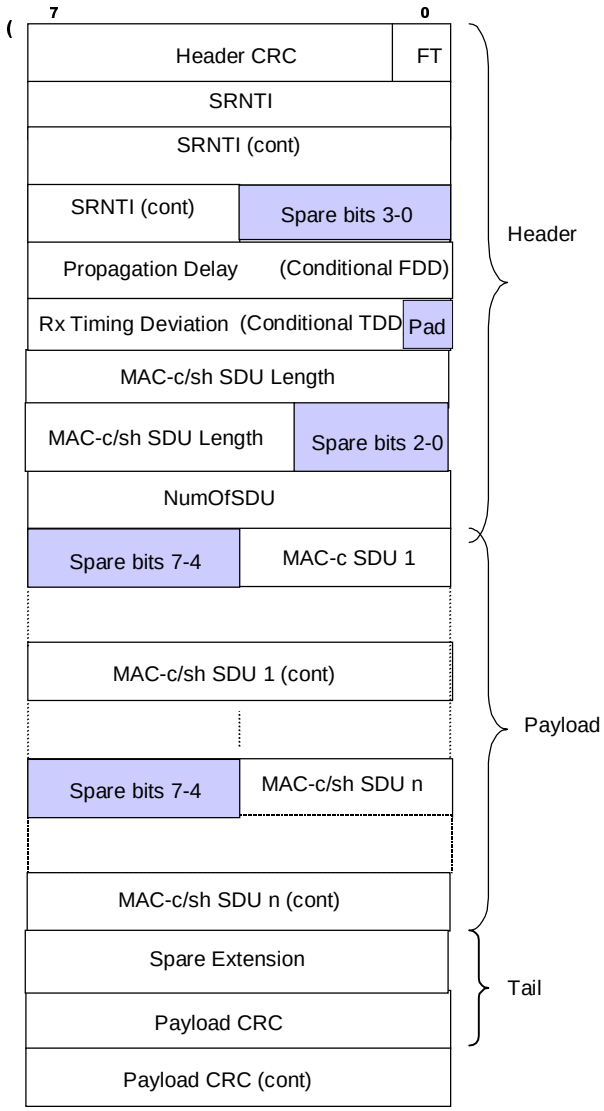

Figure 9: RACH/CPCH[FDD] Data Frame structure

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH/CPCH[FDD] Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a TDD Cell.

~~Spare bits shall be set to 0 and ignored by the receiver.~~

6.2.2 FACH Channels

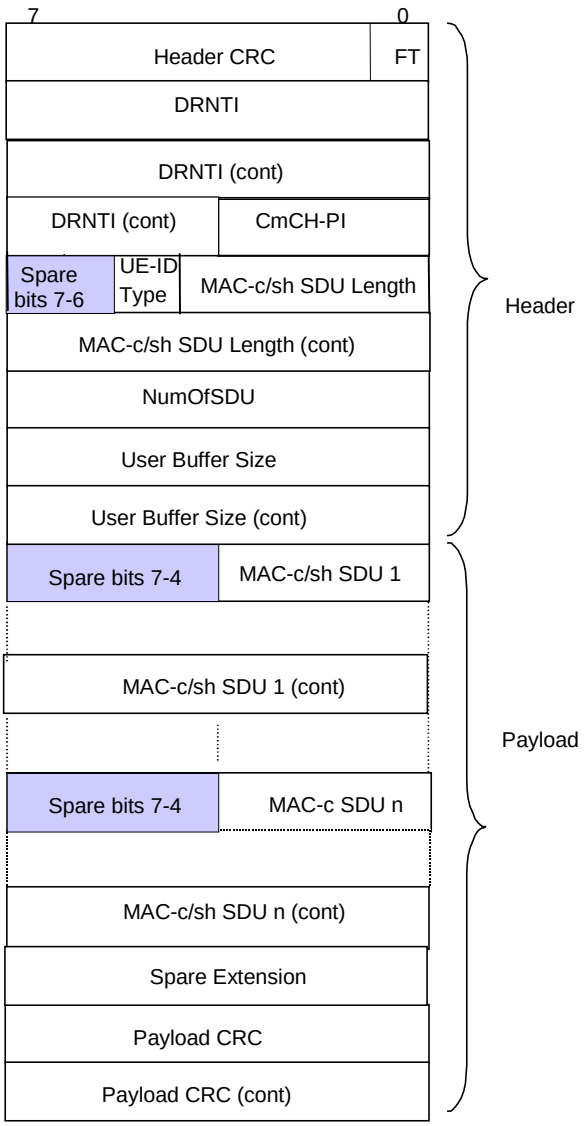

Figure 10: FACH Data Frame structure

~~Spare bits shall be set to 0 and ignored by the receiver.~~