3GPP TSG SA WG3 Security — S3#22   **S3-020009**

25 - 28 February 2002

Bristol, UK

TSG-RAN Working Group 2 (Radio L2 and Radio L3)   *R2-012774*
Makuhari, Japan, 26 - 30 November 2001

Title:	**LS on Removal of Tr mode DCCH**
Source:	**RAN2**
To:	**SA3**
Cc:	
Response to:	
Release:	**R'99**

Contact Person:
    Name: Francesco Grilli
    Tel. Number: +1-858-845-3742
    E-mail Address: francesco@qualcomm.com

Attachments: R2-012519, CR 1130 to 25.331 on Removal of Tr mode DCCH from R99 only

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1. Overall Description:

RAN2 has agreed to remove Tr mode DCCH from R'99 specifications, while keeping it in Rel-4. As a result, the "TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)" has been removed from the list of messages, which are not integrity protected.

RAN2 would like to ask SA3 to note the above change, and to align TS 33.102 accordingly (R'99 only).

RAN2 believes that it would be beneficial to list the RRC messages, which are not integrity protected, in a single specification, so that, if the list is updated, the risk of misalignments can be minimized.

2. Actions:

To SA3 group.

ACTION: RAN2 asks SA3 group to remove "TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)" from the list of messages in section 6.5.1 of TS 33.102 (for R'99 only). Moreover, RAN2 asks SA3 group to consider the possibility to remove the list of messages from section 6.5.1 of TS 33.102 and to replace it with a reference to TS 25.331 (for all releases).

3. Date of Next RAN2 Meetings:

RAN2_26	7 – 11 January 2002	Sophia Antipolis, France.
RAN2_27	18 – 22 February 2002	Orlando, FL, USA.

CR-Form-v4

CHANGE REQUEST

| ⌘ | **25.331 CR 1130** | ⌘ | rev | **-** | ⌘ | Current version: | **3.8.0** | ⌘ |

*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 **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Removal of Tr mode DCCH from R99 only	
Source: ⌘	Qualcomm	
Work item code: ⌘		***Date:*** ⌘ November 26, 2001

Category: ⌘ **F**	***Release:*** ⌘ R99
Use one of the following categories:	*Use one of the following releases:*
F *(correction)*	*2 (GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96 (Release 1996)*
B *(addition of feature),*	*R97 (Release 1997)*
C *(functional modification of feature)*	*R98 (Release 1998)*
D *(editorial modification)*	*R99 (Release 1999)*
Detailed explanations of the above categories can	*REL-4 (Release 4)*
be found in 3GPP TR 21.900.	*REL-5 (Release 5)*

Reason for change: ⌘	Transparent Mode DCCH is intended to support TFO and TrFO with GSM networks. Anyhow, these features will only be fully supported by the standard only from Rel-4 onward. Moreover, the way Transparent Mode DCCM is defined in R99 is extremely inefficient, e.g. 20-60 bits of information are sent almost every 20 ms to convey an information that could be more appropriately be encoded with 3-5 bits. Therefore it seems very unlikely that this R99 feature would ever be deployed in commercial networks. Its removal, on the other hand, would simplify the UE development and it would reduce the amount of testing. Note that none of the configurations so far defined in TS 34.108v3.4.0 includes the Transparent Mode DCCH.

Isolated Impact Change Analysis.

This change affects the Tr Mode DCCH.

It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise. |
| ***Summary of change:*** ⌘ | Transparent Mode DCCH is removed from RRC prtocol specification R99 |
| ***Consequences if not approved:*** ⌘ | UE would be unnecessary complex to implement a feature that will almost certainly never be implemented in R99 systems. |

Clauses affected: ⌘	6.3, 8.2.5.2, 8.2.5.4, 8.2.5.5, 8.5.10, 8.6.5.6, 10.2.53, 10.3.5.1, 10.3.5.17, 11.2, 11.3, 13.5.2

Other specs ⌘	**X**	Other core specifications ⌘	CR 057 to TS 25.301
			CR 167 to TS 25.322
			CR 062 to TS 25.303
			TS 33.102 may also be affected
affected:	☐	Test specifications	
	☐	O&M Specifications	

Other comments:	⌘	There is no shadow Rel-4 CR, since Transparent Mode DCCH is supported in Rel-4. R2-01???? Is the LS to inform SA3 of the removal of the "TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)" from the list of messages for which integrity protection is not performed. The removal of this feature was agreed at RAN2 #24 during the discussion of R2-012344.

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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

[…]

6.3   Signalling Radio Bearers

The Radio Bearers (RB) available for transmission of RRC messages are defined as "signalling radio bearers" and are specified in the following. The UE and UTRAN shall select the signalling radio bearers for RRC messages using RLC-TM, RLC-UM or RLC-AM on the DCCH and CCCH, according to the following:

-   Signalling radio bearer RB0 shall be used for all messages sent on the CCCH (UL: RLC-TM, DL: RLC-UM).

-   Signalling radio bearer RB1 shall be used for all messages sent on the DCCH, when using RLC unacknowledged mode (RLC-UM).

-   Signalling radio bearer RB2 shall be used for all messages sent on the DCCH, when using RLC acknowledged mode (RLC-AM), except for the RRC messages carrying higher layer (NAS) signalling.

-   Signalling radio bearer RB3 and optionally Signalling radio bearer RB4 shall be used for the RRC messages carrying higher layer (NAS) signalling and sent on the DCCH in RLC acknowledged mode (RLC-AM), as specified in subclauses 8.1.8., 8.1.9 and 8.1.10.

-   ~~Additionally, RBs whose identities shall be set between 5 and 32 may be used as signalling radio bearer for the RRC messages on the DCCH sent in RLC transparent mode (RLC-TM).~~

-   RRC messages on the SHCCH are mapped either on RACH or on the USCH in the uplink using TM and either on FACH or on the DSCH using RLC-UM. These messages are only specified for TDD mode.

The Radio Bearer configuration for signalling radio bearer RB0, SHCCH, BCCH on FACH and PCCH on PCH are specified in subclauses 13.6, 13.6a, 13.6b and 13.6c.

When an RRC message is transmitted in DL on CCCH or SHCCH using RLC UM, RRC should indicate to RLC that a special RLC length indicator should be used [16]. The UE shall assume that this indication has been given. The special length indicator indicates that an RLC SDU begins in the beginning of an RLC PDU.

[…]

8.2.5   Transport format combination control
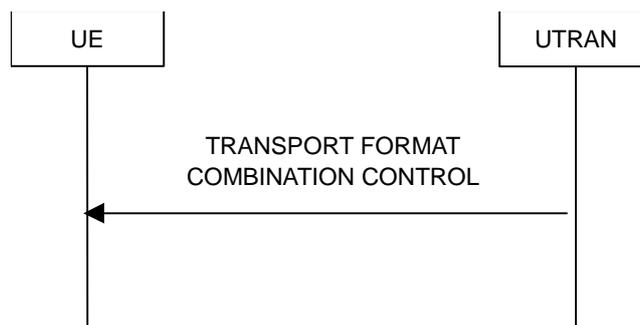
Figure 32: Transport format combination control, normal flow
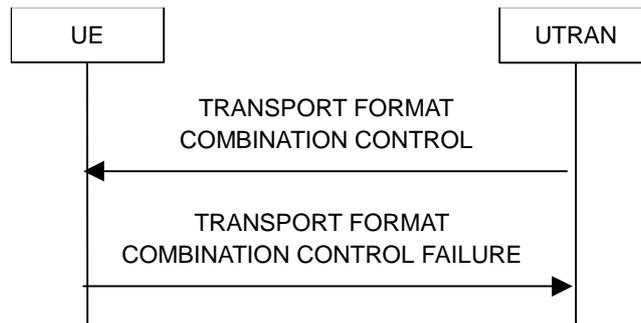
Figure 33: Transport format combination control, failure case

8.2.5.1 General

The transport format combination control procedure is used to control the allowed uplink transport format combinations within the transport format combination set.

8.2.5.2 Initiation

To initiate the transport format combination control procedure, the UTRAN transmits the TRANSPORT FORMAT COMBINATION CONTROL message on the downlink DCCH using AM, or UM or TM RLC. When not stated otherwise elsewhere, the UE may initiate the transport format combination control procedure also when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected.

To change the sub-set of allowed transport format combinations, the UTRAN shallshould:

- set the allowed TFCs in the IE "TFC subset". The network can optionally specify the duration for which a new TFC sub-set applies by using the IE "TFC Control duration" and independently can optionally specify the time at which a new TFC sub-set shall be applied using the IE "Activation Time".

To remove completely the previous restrictions of allowed transport format combinations, the UTRAN shallshould:

- set the "full transport format combination" in the IE "TFC subset".

8.2.5.3 Reception of a TRANSPORT FORMAT COMBINATION CONTROL message by the UE

Upon reception of the TRANSPORT FORMAT COMBINATION CONTROL message the UE shall:

- act upon all received information elements as specified in 8.6, unless specified otherwise in the following;

- perform the actions for the transport format combination subset specified in the IE "DPCH/PUSCH TFCS in uplink" according to subclause 8.6.5.3;

- if the variable INVALID_CONFIGURATION is set to FALSE:

  - if the IE "TFC Control duration" is included in the message:

    - store the value of the IE "TFC Control duration" in the IE "Duration" in the variable TFC_SUBSET

    - set the IE "Current TFC subset" (or IE "TFCS Id" in case of TDD) in the variable TFC_SUBSET to the value of the IE "Transport format combination subset";

    - apply the transport format combination subset in the IE "Current TFC subset" stored in the variable TFC_SUBSET for the number of (10 ms) frames specified in the IE "TFC Control duration";

    - at the end of the time period defined by the IE "TFC control duration":

      - if the variable TFC_SUBSET has not subsequently been reset by another message:

        - go back to any previous restriction of the transport format combination set defined by the content of the IE "Default TFC subset" in the variable TFC_SUBSET;

- set the value of the IE "Current TFC subset" in the variable TFC_SUBSET to the value of the IE "Default TFC subset" in the variable TFC_SUBSET;

- clear the IE "Duration" in the variable TFC_SUBSET;

- if the IE "TFC Control duration" is not included in the message:

- set both the IE "Current TFC subset" and the IE "Default TFC subset" (or IE "TFCS Id" in case of TDD) in the variable TFC_SUBSET to the value of the IE "Transport format combination subset";

- if the UE is unable to comply with the reconfiguration due to an invalid activation time:

- set the variable INVALID_CONFIGURATION to TRUE.

The UE shall:

- clear the entry for the TRANSPORT FORMAT COMBINATION CONTROL message in the table "Accepted transactions" in the variable TRANSACTIONS;

- and the procedure ends.

8.2.5.4　　　Invalid configuration

If the variable INVALID_CONFIGURATION is set to TRUE due to the received TRANSPORT FORMAT COMBINATION CONTROL message the UE shall:

- if the TRANSPORT FORMAT COMBINATION CONTROL message was received on AM RLC:

- keep the TFC subset existing before the TRANSPORT FORMAT COMBINATION CONTROL message was received;

- transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the DCCH using AM RLC;

- set the IE "RRC transaction identifier" in the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message to the value of "RRC transaction identifier" in the entry for the TRANSPORT FORMAT COMBINATION CONTROL message in the table "Accepted transactions" in the variable TRANSACTIONS; and

- clear that entry;

- set the IE "failure cause" to "invalid configuration";

- when the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been submitted to lower layers for transmission the procedure ends.

- if the TRANSPORT FORMAT COMBINATION CONTROL message was received on UM RLC ~~or TM RLC~~:

- ignore the TRANSPORT FORMAT COMBINATION CONTROL message.

8.2.5.5　　　Invalid TRANSPORT FORMAT COMBINATION CONTROL message

If the TRANSPORT FORMAT COMBINATION CONTROL message ~~was received on AM RLC or UM RLC and~~ contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the uplink DCCH using AM RLC setting the information elements as specified below;

- set the IE "RRC transaction identifier" in the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message to the value of "RRC transaction identifier" in the entry for the TRANSPORT FORMAT COMBINATION CONTROL message in the table "Rejected transactions" in the variable TRANSACTIONS; and

- clear that entry;

- set the IE "failure cause" to the cause value "protocol error";

- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;

- when the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been submitted to lower layers for transmission:

- continue with any ongoing processes and procedures as if the invalid TRANSPORT FORMAT COMBINATION CONTROL message has not been received;

- and the procedure ends.

~~If the TRANSPORT FORMAT COMBINATION CONTROL message was received on TM RLC and contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:~~

- ~~ignore the invalid TRANSPORT FORMAT COMBINATION CONTROL message as if it has not been received;~~

- ~~the procedure ends.~~

[…]

8.5.10   Integrity protection

If the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started" then the UE and UTRAN shall:

- perform integrity protection (and integrity checking) on all RRC messages, with the following exceptions:

  HANDOVER TO UTRAN COMPLETE

  PAGING TYPE 1

  PUSCH CAPACITY REQUEST

  PHYSICAL SHARED CHANNEL ALLOCATION

  RRC CONNECTION REQUEST

  RRC CONNECTION SETUP

  RRC CONNECTION SETUP COMPLETE

  RRC CONNECTION REJECT

  RRC CONNECTION RELEASE (CCCH only)

  SYSTEM INFORMATION

  SYSTEM INFORMATION CHANGE INDICATION

  ~~TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)~~

If the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

- "Uplink RRC HFN";

- "Downlink RRC HFN".

and two message sequence numbers:

- "Uplink RRC Message sequence number";

- "Downlink RRC Message sequence number".

The above information is stored in the variable INTEGRITY_PROTECTION_INFO per signalling radio bearer (RB0-RB4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

As a general rule, the RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message. In cases when there are exceptions, these are stated for those procedures.

[…]

8.6.5.6 Added or Reconfigured DL TrCH information

If the IE "Added or Reconfigured DL TrCH information" is included then for the transport channel identified by the IE "DL Transport Channel Identity" the UE shall:

- if the choice "DL parameters" is set to 'independent':

    - perform the actions for the IE "Transport Format Set" as specified in subclause 8.6.5.1;

- if the choice "DL parameters" is set to 'same as uplink':

    - if the IE "UL Transport Channel Identity" indicates an existing or a new UL Transport Channel:

        - store as transport format for this transport channel the transport format associated with the transport channel identified by the IE "UL Transport Channel Identity";

    - else:

        - set the variable INVALID_CONFIGURATION to TRUE;

- if the IE "DCH quality target" is included:

    - perform the actions specified in subclause 8.6.5.4;

- if the IE "Transparent mode signalling info" is included:

    - ignore the IE "Transparent mode signalling info".

    - ~~consider the messages received on this transport channel to have the message type according to the value of the IE "Type of message";~~

    - ~~if the choice "Transparent signalling mode" is set to "Mode 1":~~

        - ~~consider the messages received on this transport channel affect all established DCHs;~~

    - ~~if the choice "Transparent signalling mode" is set to "Mode 2":~~

        - ~~consider the messages received on this transport channel affect the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list";~~

        - ~~if any of the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list" does not exist:~~

            - ~~set the variable INVALID_CONFIGURATION to TRUE.~~

[…]

10.2.53 TRANSPORT FORMAT COMBINATION CONTROL

This message is sent by UTRAN to control the uplink transport format combination within the allowed transport format combination set.

RLC-SAP: ~~TM,~~ AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	~~CV-notTM~~MP		Message Type	
UE information elements				
RRC transaction identifier	~~CV-notTM~~MP		RRC transaction identifier 10.3.3.36	
Integrity check info	~~CV-notTM~~CH		Integrity check info 10.3.3.16	
TrCH information elements				
CHOICE *mode*	MP			
>FDD				(no data)
>TDD				
>>TFCS Id	OP		Transport Format Combination Set Identity 10.3.5.21	
DPCH/PUSCH TFCS in uplink	MP		Transport Format Combination subset 10.3.5.22	
Activation time for TFC subset	~~CV-notTMMD~~MD		Activation time 10.3.3.1	Default value is "now"
TFC Control duration	~~CV-notTMopt~~OP		TFC Control duration 10.3.6.80	

~~Condition~~	~~Explanation~~
~~*NotTM*~~	~~The message type is not needed when transmitting the message on the transparent mode signalling DCCH and mandatory present otherwise.~~
~~*NotTMopt*~~	~~The information element is not needed when transmitting the message on the transparent mode signalling DCCH and is optional otherwise.~~
~~*NotTMMD*~~	~~The information element is not needed when transmitting the message on the transparent mode signalling DCCH and is mandatory with default otherwise.~~

~~If transparent mode signalling is used and the encoded message does not fill a transport block, the RRC layer shall insert padding according to subclause 12.1.~~

[…]

10.3.5.1   Added or Reconfigured DL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink transport channel type	MP		Enumerated(DCH,DSCH)	
DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
CHOICE *DL parameters*				
>Explicit				
>>TFS	MP		Transport Format Set 10.3.5.23	
>SameAsUL				
>>Uplink transport channel type	MP		Enumerated(DCH,USCH)	USCH is TDD only
>>UL TrCH identity	MP		Transport channel identity 10.3.5.18	Same TFS applies as specified for indicated UL TrCH
DCH quality target	OP		Quality target 10.3.5.10	
Transparent mode signalling info	~~CV-MessageType~~OP		Transparent mode signalling info 10.3.5.17	This IE is <u>should not be included in this version of the protocol</u>~~not used in RB RELEASE message nor RB RECONFIGURATION message~~

~~Condition~~	~~Explanation~~
~~MessageType~~	~~This IE is not needed in Radio Bearer Release message and Radio Bearer Reconfiguration message. Otherwise it is optional.~~

[…]

10.3.5.17   Transparent mode signalling info

<u>This IE is not used in this version of the protocol.</u>

~~Information Element~~	~~Need~~	~~Multi~~	~~Type and reference~~	~~Semantics description~~
~~Type of message~~	~~MP~~		~~Enumerated (TRANSPORT FORMAT COMBINATION CONTROL)~~	~~Indicates which type of message sent on the transparent mode signalling DCCH~~
~~CHOICE *Transparent signalling mode*~~	~~MP~~			
~~>Mode 1~~				~~(no data)~~
~~>Mode 2~~				
~~>>Controlled transport channels list~~	~~MP~~	~~1 to <maxTrCH>~~		~~The transport channels that are effected by the rate control commands sent on this transparent mode DCCH~~
~~>>>UL Controlled transport channels~~	~~MP~~		~~Transport channel identity, 10.3.5.18~~	~~transport channel type = DCH~~

[…]

11.2   PDU definitions

[...]

```
-- **************************************************
--
-- TRANSPORT FORMAT COMBINATION CONTROL
--
-- **************************************************

TransportFormatCombinationControl ::= SEQUENCE {
        TABULAR: Integrity protection shall not be performed on this message when transmitting this
message
     -- on the transparent mode signalling DCCH.
        rrc-TransactionIdentifier       RRC-TransactionIdentifier          OPTIONAL,
     -- The information element is not always included when transmitting the message
        on the transparent mode signalling DCCH
     modeSpecificInfo                    CHOICE {
         fdd                                 NULL,
         tdd                                 SEQUENCE {
             tfcs-ID                             TFCS-Identity   OPTIONAL
             }
     },
     dpch-TFCS-InUplink              TFC-Subset,
     activationTimeForTFCSubset      ActivationTime                     OPTIONAL,
     tfc-ControlDuration             TFC-ControlDuration                OPTIONAL,
     -- The information element is not included when transmitting the message
        on the transparent mode signalling DCCH and is optional otherwise
     -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}     OPTIONAL
}
```
[...]

11.3   Information element definitions

[...]

```
-- ASN.1 for IE "Added or Reconfigured DL TrCH information"
-- in case of messages other than: Radio Bearer Release message and
-- Radio Bearer Reconfiguration message
DL-AddReconfTransChInformation ::=  SEQUENCE {
    dl-TransportChannelType         DL-TrCH-Type,
    dl-transportChannelIdentity     TransportChannelIdentity,
    tfs-SignallingMode              CHOICE {
        explicit-config                 TransportFormatSet,
        sameAsULTrCH                    UL-TransportChannelIdentity
    },
    dch-QualityTarget               QualityTarget                      OPTIONAL,
    -- This IE is not used in this version of the specification and should be ignored.
    tm-SignallingInfodummy          TM-SignallingInfo                  OPTIONAL
}
```

[...]

```
TFCS-RemovalList ::=                SEQUENCE (SIZE (1..maxTFC)) OF
                                    TFCS-Removal

TimeDurationBeforeRetry ::=         INTEGER (1..256)

TM-SignallingInfo   ::=             SEQUENCE {
    messType                        MessType,
    tm-SignallingMode               CHOICE {
        mode1                           NULL,
        mode2                           SEQUENCE {
        --TrCH-Type is always DCH
        ul-controlledTrChList               UL-ControlledTrChList
        }
    }
}

TransmissionTimeInterval ::=        ENUMERATED {
                                    tti10, tti20, tti40, tti80 }
```
[...]

13.5.2 RRC procedure performance values

NOTE: Times indicated in the table do not include cell reselection.

Procedure title:	UTRAN -> UE	UE -> UTRAN	N1	N2	Notes
RRC Connection Management Procedures					
Broadcast of system information	SYSTEM INFORMATION				N2 is not applicable for any system information messages, because there is no response message from the UE.
Master Information Block	SYSTEM INFORMATION		5	NA	No system information data shall be lost due to processing of a MIB received with no detectable errors. This means that the UE shall buffer all system information data received after the MIB until the data can be processed according to the information in the MIB, unless the MIB was received erroneously.
System Information Block type 1	SYSTEM INFORMATION		10	NA	
System Information Block type 2	SYSTEM INFORMATION		10	NA	
System Information Block type 3	SYSTEM INFORMATION		10	NA	
System Information Block type 4	SYSTEM INFORMATION		10	NA	
System Information Block type 5	SYSTEM INFORMATION		10	NA	
System Information Block type 6	SYSTEM INFORMATION		10	NA	
System Information Block type 7	SYSTEM INFORMATION		5	NA	
System Information Block type 8	SYSTEM INFORMATION		10	NA	
System Information Block type 9	SYSTEM INFORMATION		5	NA	
System Information Block type 10	SYSTEM INFORMATION		5	NA	
System Information Block type 11	SYSTEM INFORMATION		10	NA	
System Information Block type 12	SYSTEM INFORMATION		10	NA	
System Information Block type 13	SYSTEM INFORMATION		10	NA	
System Information Block type 14	SYSTEM INFORMATION		10	NA	
System Information Block type 15	SYSTEM INFORMATION		10	NA	
System Information Block type 16	SYSTEM INFORMATION		10	NA	
System Information Block type 18	SYSTEM INFORMATION		10	NA	
RRC connection establishment *Target state CELL_DCH*	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	NA	N1 measures time to the start of tx / rx on DPCH. N2 cannot be specified, because RRC CONNECTION SETUP COMPLETE message is transmitted only after physical layer synchronisation, which also depends on the Node B. The performance of the physical layer synchronisation procedure is specified in [19] and [20]

RRC connection establishment *Target state CELL_FACH*	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	11	N1 and N2 applicable as defined (N2 can be tested from the initiation of the power ramp on RACH).
RRC connection release *From CELL_DCH state*	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	5	8	N1 sets the requirement for the time from the completion of the last repetition of the RRC CONNECTION RELEASE COMPLETE message to the release of the physical channel.

N2 sets the requirement from the end of successful reception of the RRC CONNECTION RELEASE message to the start of the first transmission of the RRC CONNECTION RELEASE COMPLETE message. |
RRC connection release *From CELL_FACH state*	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	NA	11	N1 represents UE internal configuration that cannot be externally observed.
Paging	PAGING TYPE 1	CELL UPDATE	10	11+T	T is the repetition period of SIB7 (applicable for FDD) and SIB14 (applicable for TDD)
UE capability enquiry	UE CAPABILITY ENQUIRY	UE CAPABILITY INFORMATION	NA	8	N1 is not applicable because the UE configuration does not change.
Security mode control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	5	8	
Signalling connection release procedure	SIGNALLING CONNECTION RELEASE		5	NA	N2 is not applicable because there is no response message.
Counter check	COUNTER CHECK	COUNTER CHECK RESPONSE	NA	8	N1 is not applicable because the UE configuration does not change.
Radio Bearer control procedures					
Radio bearer establishment *Target state CELL_DCH*	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER SETUP COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Radio bearer establishment *From state CELL_FACH to state CELL_FACH*	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	11	
Radio bearer establishment *From CELL_DCH to CELL_FACH*	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER SETUP COMPLETE
Radio bearer reconfiguration *Target state CELL_DCH*	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.

Radio bearer reconfiguration *From state CELL_FACH to state CELL_FACH*	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	11	
Radio bearer reconfiguration *From state CELL_DCH to state CELL_FACH*	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Radio bearer release *Target state CELL_DCH*	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release *From state CELL_FACH to state CELL_FACH*	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release *From state CELL_DCH to state CELL_FACH*	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Transport channel reconfiguration *Target state CELL_DCH*	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Transport channel reconfiguration *From state CELL_FACH to state CELL_FACH*	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	11	
Transport channel reconfiguration *From state CELL_DCH to state CELL_FACH*	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending TRANSPORT CHANNEL RECONFIGURATION COMPLETE
Transport format combination control *AM or UM RLC mode*	TRANSPORT FORMAT COMBINATION CONTROL	TRANSPORT FORMAT COMBINATION CONTROL FAILURE	5	8	
~~Transport format combination control~~ ~~*Transparent mode*~~	~~TRANSPORT FORMAT COMBINATION CONTROL~~		~~5~~	~~NA~~	~~N2 is not applicable because no response message is defined.~~
Physical channel reconfiguration *Target state CELL_DCH*	PHYSICAL CHANNEL RECONFIGURATION	PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE	8	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.

Physical channel reconfiguration *From state CELL_FACH to state CELL_FACH*	PHYSICAL CHANNEL RECONFIGURA TION	PHYSICAL CHANNEL RECONFIGURAT ION COMPLETE / FAILURE	8	9	
Physical channel reconfiguration *From state CELL_DCH to state CELL_FACH*	PHYSICAL CHANNEL RECONFIGURA TION	PHYSICAL CHANNEL RECONFIGURAT ION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending PHYSICAL CHANNEL RECONFIGURATION COMPLETE
Physical Shared Channel Allocation [TDD only]	PHYSICAL SHARED CHANNEL ALLOCATION		5	NA	N2 is not applicable because no response message is defined.
Uplink Physical Channel Control [TDD only]	UPLINK PHYSICAL CHANNEL CONTROL		NA	NA	Requirements for outer loop and timing advance adjustments are defined in [22] and [20].
RRC connection mobility procedures					
Cell update	CELL UPDATE CONFIRM	UTRAN MOBILITY INFORMATION CONFIRM	5	8	
		PHYSICAL CHANNEL RECONFIGURAT ION COMPLETE *Target state CELL_FACH*	8	9	
		PHYSICAL CHANNEL RECONFIGURAT ION COMPLETE *Target state CELL_DCH*	8	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
		TRANSPORT CHANNEL RECONFIGURAT ION COMPLETE *Target state CELL_FACH*	10	11	
		TRANSPORT CHANNEL RECONFIGURAT ION COMPLETE *Target state CELL_DCH*	10	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
		RADIO BEARER RECONFIGURAT ION COMPLETE *Target state CELL_FACH*	10	11	

		RADIO BEARER RECONFIGURATION COMPLETE *Target state CELL_DCH*	10	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
		RADIO BEARER RELEASE COMPLETE *Target state CELL_DCH*	10	11	
URA update	URA UPDATE CONFIRM	UTRAN MOBILITY INFORMATION CONFIRM	5	8	
UTRAN mobility information	UTRAN MOBILITY INFORMATION	UTRAN MOBILITY INFORMATION CONFIRM / FAILURE	5	8	
Active set update	ACTIVE SET UPDATE	ACTIVE SET UPDATE COMPLETE / FAILURE	NA	8	The requirements on UE combining and power control performance for both UL and DL are specified by RAN WG4 in [21] and [19]. Also in case of branch addition the COMPLETE / FAILURE message is transmitted without waiting for the new branch to stabilise, therefore N2 is specified.
Inter-RAT handover to UTRAN	HANDOVER TO UTRAN COMMAND (other system)	HANDOVER TO UTRAN COMPLETE	NA	NA	The performance of this procedure is specified in 05.10.
Inter-RAT handover from UTRAN	HANDOVER FROM UTRAN COMMAND	HANDOVER FROM UTRAN FAILURE	NA	NA	The performance of this procedure is specified in [19] and [20].
Measurement procedures					
Measurement control	MEASUREMENT CONTROL	MEASUREMENT CONTROL FAILURE	5	8	Response to measurement inquiry depends on physical layer measurement. Response time is defined in [19] and [20]. N1 and N2 only define the processing of the message.

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