TSG-RAN Meeting #7 ***RP-000034***
Madrid, Spain, 13 – 15 March 2000

Title: **Agreed CRs to TS 25.301**

Source: **TSG-RAN WG2**

Agenda item: **6.3.3**

Doc-1st-	Spec	CR	Rev	Subject	Cat	Version	Versio
R2-000213	25.301	032		Correction of the CFN length	F	3.3.0	3.4.0
R2-000568	25.301	034		Removal of SCH	F	3.3.0	3.4.0

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Document R2-000213
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.301 CR 032 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #7
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 2000-1-19

Subject: Correction of the CFN length

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: According to the R3 specification (TS25.402 v3.0.0 chaper5), the length of CFN is defined as 8 bits. However, in this specification it is defined as 7 bits. Therefore, it is necessary to correct the length of CFN in line with the R3 specification.

Clauses affected: 8.2.2.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

-

8.2.2.1 COUNT

COUNT shall be at least 32 bits long. It is composed of a ‘long’ sequence number called Hyper Frame Number HFN, and a ‘short’ sequence number, which depends on the ciphering mode, as described below. There is one ciphering sequence per logical channel using AM or UM mode plus one for all logical channels using the transparent mode (and mapped onto DCH).

The Hyper Frame Number (HFN) is initialised by the UE and signalled to the SRNC before ciphering is started. It is used as initial value for each ciphering sequence, and it is then incremented independently in each ciphering sequence, at each cycle of the ‘short’ sequence number. When a new RAB / logical channel is created during a RRC connection, the highest HFN value currently in use is incremented, and used as initial value for the ciphering sequence of this new logical channel. The highest HFN value used during a RRC connection (by any ciphering sequence) is stored in the USIM, and the UE initialises the new HFN for the next session with a higher number than the stored one. If no HFN value is available in USIM, the UE randomly selects a HFN value.

Depending on the requirements (e.g. how many successive RRC Connections can use the same ciphering key), it may be sufficient to use only the most significant bits of HFN in the re-initialisation (and set LSBs implicitly to zero). This may be necessary at least if the HFN value needs to be included in the RRC Connection Request message.

The ‘short’ sequence number is:

- For RLC TM on DCH, the CFN of the UEFN is used and is independently maintained in UE MAC and SRNC MAC-d. The ciphering sequence number is identical to the UEFN.
- For RLC UM and AM modes, the RLC sequence number is used, and is directly available in each RLC PDU at the receiver side (it is not ciphered). The HFN is incremented at each RLC SN cycle.

The figure below presents some examples of the different COUNT parameters, assuming various sizes for the ‘short’ sequence numbers. This proposal permits to exchange a unique HFN and also to use a unique CSN size, which should permit to reduce the implementation complexity of the ciphering function. In this example, the HFN is 25 bits long, and only the 20 MSB are used for the CSN of the RLC AM mode.

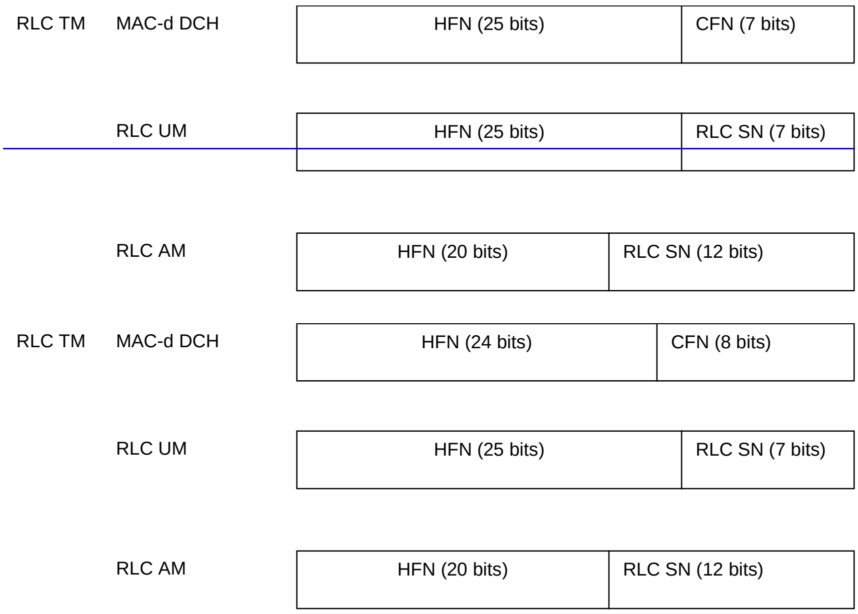

Figure 29: Example of ciphering sequence number for all possible configurations

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Document ***R2-000568***

3G CHANGE REQUEST

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25.301	**CR**	**034**	Current Version:	3.3.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submission to TSG-RAN#7 — *list TSG meeting no. here ↑*

for approval	X	*(only one box should*
for information		*be marked with an X)*

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: *(at least one should be marked with an X)*

USIM	ME	UTRAN	Core Network
		X	

Source: TSG-RAN WG2 **Date:** 22/02/2000

Subject: Removal of SCH

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: Due to performance reasons synchronisation case 3 is removed from WG1 specifications and SCH and SCCH became obsolete.

Clauses affected: 5.2.1.1, 5.3.1.1.1, 5.3.1.1.2, 5.3.5.4, 5.6.9

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	CR045 on 25.302, CR040 on 25.321, CR031 on 25.322, CR268 on 25.331
Other 2G core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

5.2.1.1 Transport channels

A general classification of transport channels is into two groups:

- common transport channels (where there is a need for inband identification of the UEs when particular UEs are addressed) and
- dedicated transport channels (where the UEs are identified by the physical channel, i.e. code and frequency for FDD and code, time slot and frequency for TDD).

Common transport channel types are (a more detailed description can be found in [4]):

- **Random Access Channel (RACH)**

  A contention based uplink channel used for transmission of relatively small amounts of data, e.g. for initial access or non-real-time dedicated control or traffic data.

- **ODMA Random Access Channel (ORACH)**

A contention based channel used in relay link.

- **Common Packet Channel (CPCH)**

  A contention based channel used for transmission of bursty data traffic. This channel only exists in FDD mode and only in the uplink direction. The common packet channel is shared by the UEs in a cell and therefore, it is a common resource. The CPCH is fast power controlled.

- **Forward Access Channel (FACH)**

  Common downlink channel without closed-loop power control used for transmission of relatively small amount of data.

- **Downlink Shared Channel (DSCH)**

  A downlink channel shared by several UEs carrying dedicated control or traffic data.

- **Uplink Shared Channel (USCH)**

  An uplink channel shared by several UEs carrying dedicated control or traffic data, used in TDD mode only.

- **Broadcast Channel (BCH)**

  A downlink channel used for broadcast of system information into an entire cell.

- ~~**Synchronisation Channel (SCH)**~~

  ~~A downlink channel used for broadcast of synchronisation information into an entire cell in TDD mode.~~

~~NOTE: The SCH transport channel is defined for the TDD mode only. In the FDD mode, a synchronisation channel is defined as a physical channel. This channel however should not be confused with the SCH transport channel defined above.~~

- **Paging Channel (PCH)**

  A downlink channel used for broadcast of control information into an entire cell allowing efficient UE sleep mode procedures. Currently identified information types are paging and notification. Another use could be UTRAN notification of change of BCCH information.

Dedicated transport channel types are:

- **Dedicated Channel (DCH)**

  A channel dedicated to one UE used in uplink or downlink.

- **Fast Uplink Signalling Channel (FAUSCH)**

  An uplink channel used to allocate dedicated channels in conjunction with FACH.

- **ODMA Dedicated Channel (ODCH)**

A channel dedicated to one UE used in relay link.

To each transport channel (except for the FAUSCH, since it only conveys a reservation request), there is an associated Transport Format (for transport channels with a fixed or slow changing rate) or an associated Transport Format Set (for transport channels with fast changing rate). A Transport Format is defined as a combination of encodings, interleaving, bit rate and mapping onto physical channels (see 3GPP TS 25.302 [4] for details). A Transport Format Set is a set of Transport Formats. E.g., a variable rate DCH has a Transport Format Set (one Transport Format for each rate), whereas a fixed rate DCH has a single Transport Format.

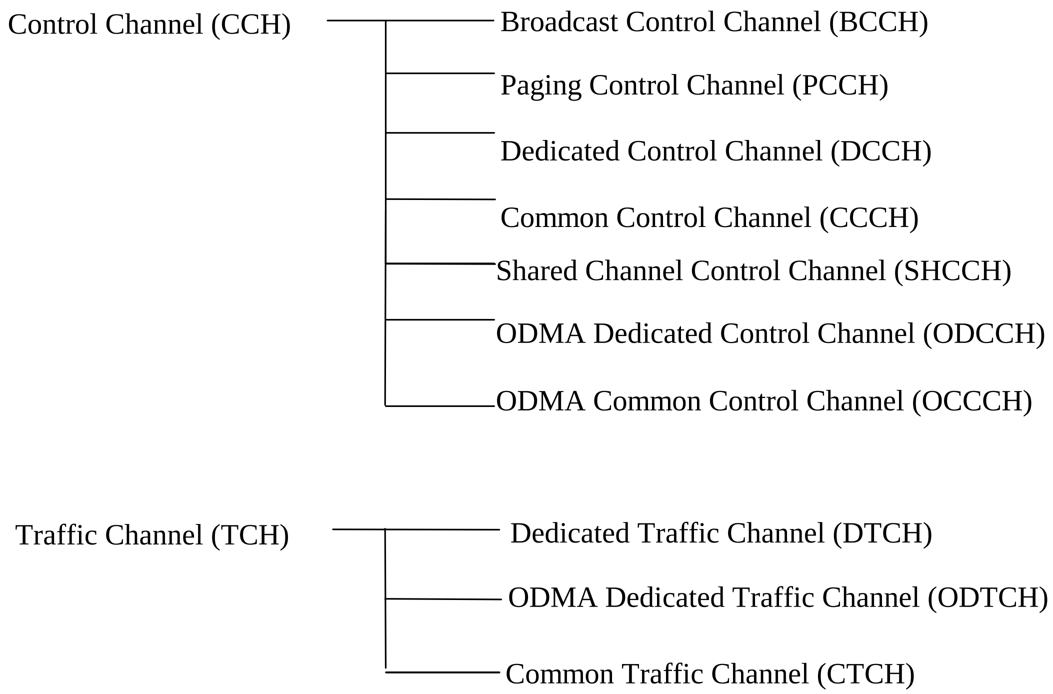
5.3.1.1.1 Logical channels

The MAC layer provides data transfer services on logical channels. A set of logical channel types is defined for different kinds of data transfer services as offered by MAC. Each logical channel type is defined by what type of information is transferred.

A general classification of logical channels is into two groups:

- Control Channels (for the transfer of control plane information)
- Traffic Channels (for the transfer of user plane information)

The configuration of logical channel types is depicted in Figure 3.



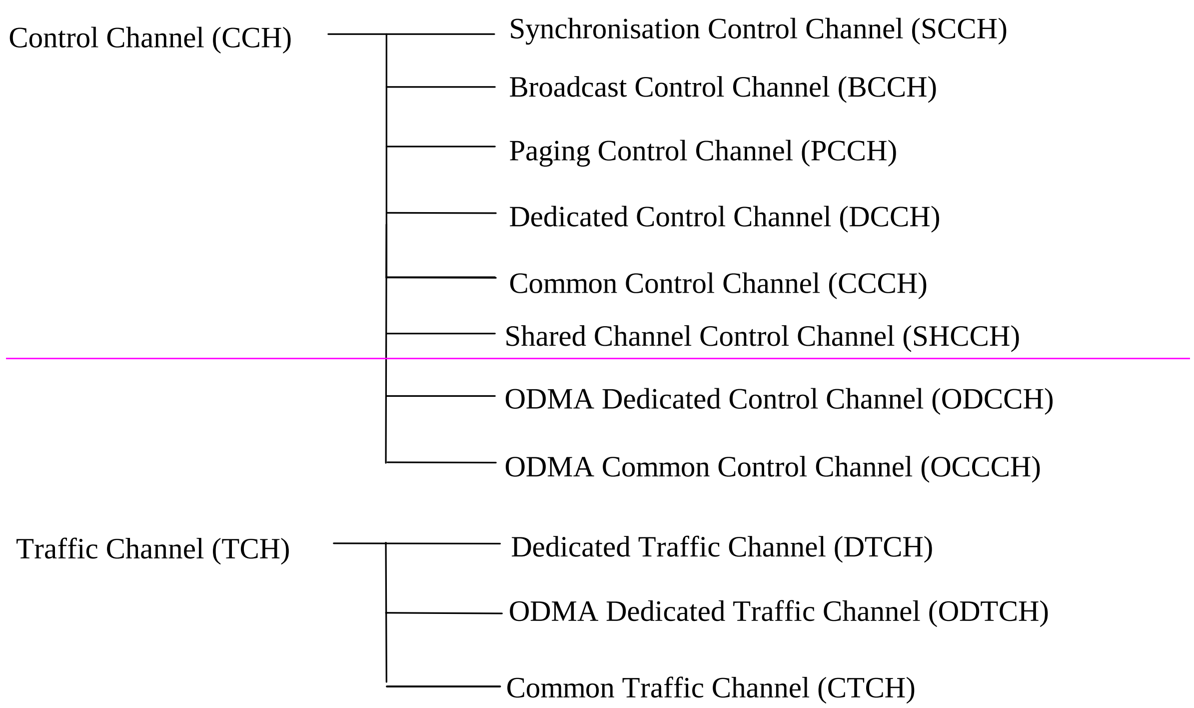


Figure 3: Logical channel structure

Control Channels

Control channels are used for transfer of control plane information only.

~~**Synchronisation Control Channel (SCCH)**~~

~~A downlink channel for broadcasting synchronisation information (information about the location and structure of the BCCH) in case of TDD operation.~~

Broadcast Control Channel (BCCH)

A downlink channel for broadcasting system control information.

Paging Control Channel (PCCH)

A downlink channel that transfers paging information. This channel is used when the network does not know the location cell of the UE, or, the UE is in the cell connected state (utilising UE sleep mode procedures).

Common Control Channel (CCCH)

Bi-directional channel for transmitting control information between network and UEs. This channel is commonly used by the UEs having no RRC connection with the network and by the UEs using common transport channels when accessing a new cell after cell reselection.

Dedicated Control Channel (DCCH)

A point-to-point bi-directional channel that transmits dedicated control information between a UE and the network. This channel is established through RRC connection setup procedure.

Shared Channel Control Channel (SHCCH)

Bi-directional channel that transmits control information for uplink and downlink shared channels between network and UEs. This channel is for TDD only.

ODMA Common Control Channel (OCCCH)

Bi-directional channel for transmitting control information between UEs.

ODMA Dedicated Control Channel (ODCCH)

A point-to-point bi-directional channel that transmits dedicated control information between UEs. This channel is established through RRC connection setup procedure.

Traffic Channels

Traffic channels are used for the transfer of user plane information only.

Dedicated Traffic Channel (DTCH)

A Dedicated Traffic Channel (DTCH) is a point-to-point channel, dedicated to one UE, for the transfer of user information. A DTCH can exist in both uplink and downlink.

ODMA Dedicated Traffic Channel (ODTCH)

An ODMA Dedicated Traffic Channel (ODTCH) is a point-to-point channel, dedicated to one UE, for the transfer of user information between UEs. An ODTCH exists in relay link.

Common Traffic Channel (CTCH)

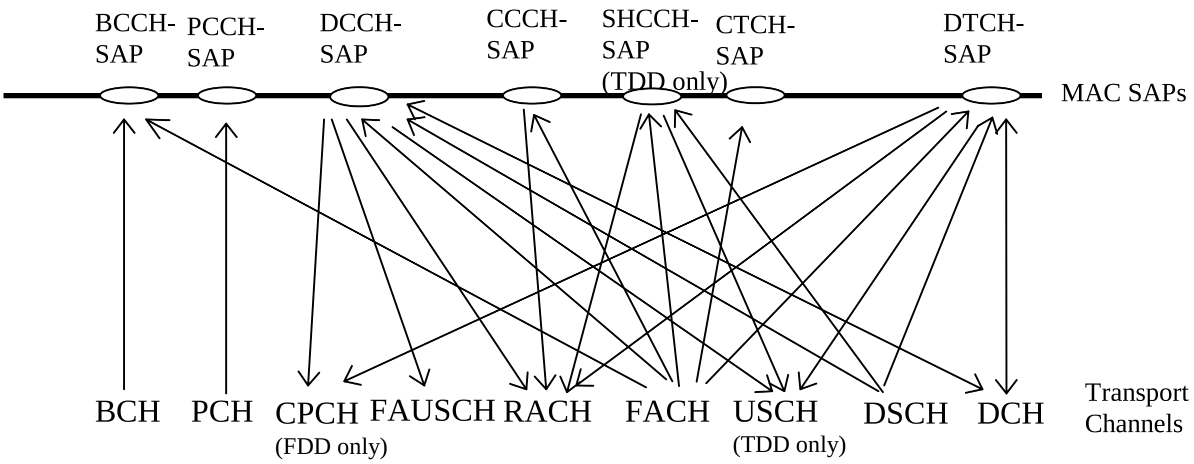
A point-to-multipoint unidirectional channel for transfer of dedicated user information for all or a group of specified UEs.

5.3.1.1.2 Mapping between logical channels and transport channels

The following connections between logical channels and transport channels exist:

- ~~SCCH is connected to SCH~~
- BCCH is connected to BCH and may also be connected to FACH
- PCCH is connected to PCH
- CCCH is connected to RACH and FACH
- SHCCH is connected to RACH and USCH/FACH and DSCH
- DTCH can be connected to either RACH and FACH, to RACH and DSCH, to DCH and DSCH, to a DCH, a CPCH (FDD only) or to USCH (TDD only)
- CTCH is connected to FACH.
- DCCH can be connected to either RACH and FACH, to RACH and DSCH, to DCH and DSCH, to a DCH, a CPCH (FDD only) to FAUSCH, CPCH (FDD only), or to USCH (TDD only).

The mappings as seen from the UE and UTRAN sides are shown in Figure 4 and Figure 5 respectively. Figure 6 illustrates the mapping from the UE in relay operation. Note that ODMA logical channels and transport channels are employed only in relay link transmissions (i.e. not used for uplink or downlink transmissions on the UE-UTRAN radio interface).



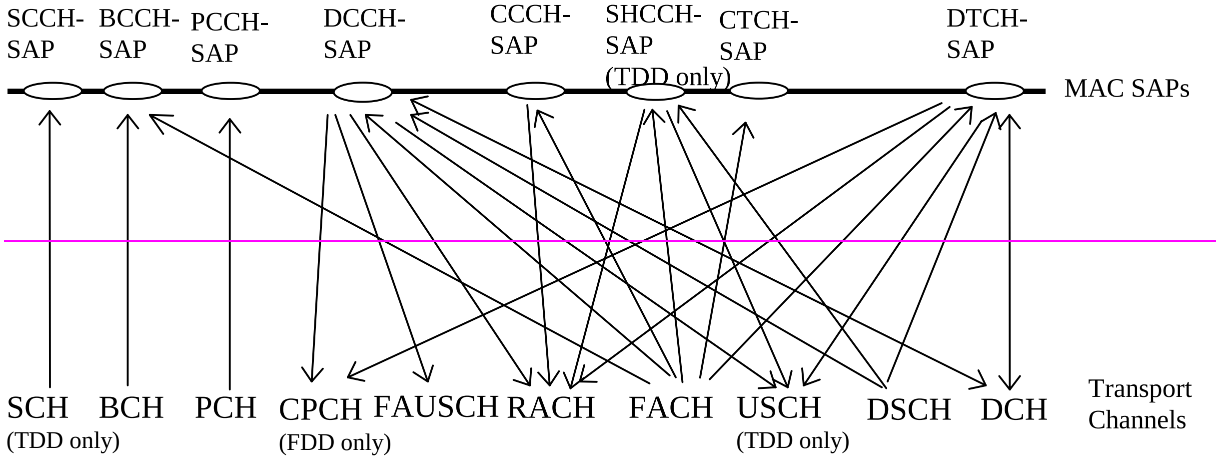
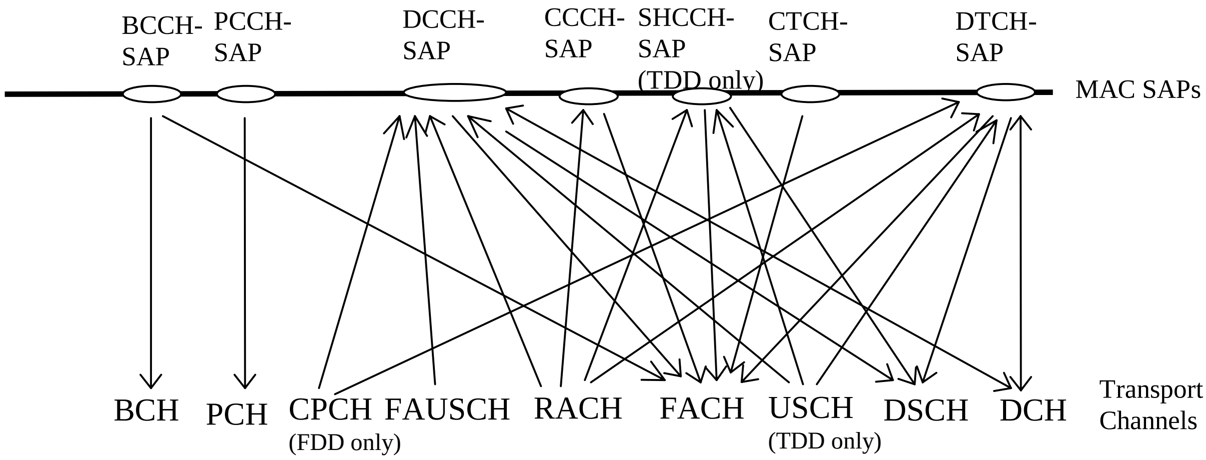


Figure 4: Logical channels mapped onto transport channels, seen from the UE side



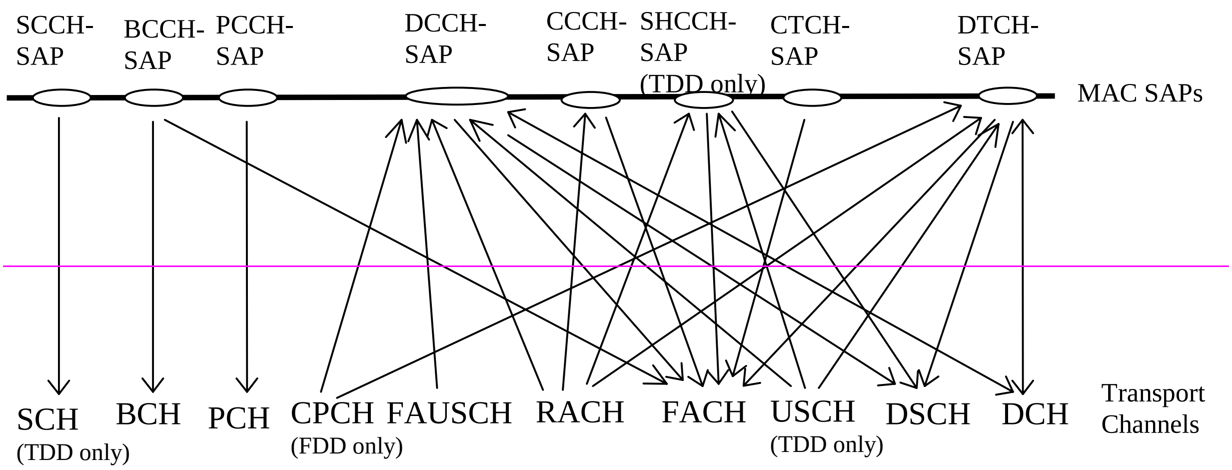


Figure 5: Logical channels mapped onto transport channels, seen from the UTRAN side

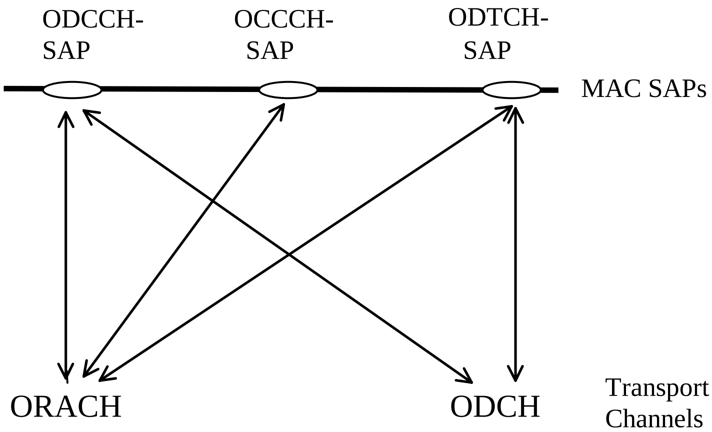


Figure 6: Logical channels mapped onto transport channels, seen from the UE side (relay only)

5.3.5.4 ~~Data flow for SCCH mapped to SCH~~void

~~Same data flow is applicable as for BCCH mapped to BCH. Applied in TDD mode only. A MAC header is not needed. The data flow shown in Figure 7 or Figure 9 applies, depending on applied RLC transmission mode.~~

5.6.9 ~~Protocol termination for transport channel of type SCH~~void

~~The SCH transport channel is used in TDD mode only. Protocol termination for SCH is the same as for BCH as shown in Figure 22.~~