Agenda Item: 14.3

Source: Nokia

Title: Delayed Transition from DCH/DCH to RACH/FACH substate

Document for: Decision

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1   INTRODUCTION

In this contribution, we clarify the delayed transition from the DCH/DCH to RACH/FACH, which includes the transition from DCH active to control-only substate [1] and the usage of the control only substate timer [2].

2   TRANSITION FROM DCH ACTIVE TO CONTROL-ONLY SUB-STATE

In control only substate, the uplink and downlink DCHs are allocated, but only DCCH transmissions are allowed, whilst DTCHs are blocked. The control-only substate is an intermediate state, which can be used to delay transition from dedicated to common channel state.

The transition from DCH active substate to control-only substate shall be initiated by the UTRAN with the transmission of one of the following messages:

- RADIO ACCESS BEARER RELEASE
- TRANSPORT CHANNEL RECONFIGURATION
- PHYSICAL CHANNEL RECONFIGURATION

The control only substate is initiated by assigning a control only substate timer value in one of the above messages. The control only substate timer is an inactivity timer, which sets the maximum duration of the DCH allocation after data transfer on the DCCH has ceased.

The control only substate is reset after every uplink or downlink DCCH transmission. If the timer expires, the UE shall release the radio link, move to RACH/FACH state and transmit a complete message (corresponding to the preceeding message). The usage of the inactivity timer eliminates extra signaling due to the delayed release of radio link.

If the control-only state timer is set to zero the UE makes a transition from DCH/DCH to RACH/FACH substate without an intermediate control-only state.

If there is an error situation during the inactivity period, (e.g. radio coverage is lost and out-of synch detected on L1), the UTRAN shall release the DCH with a PHYSICAL CHANNEL RECONFIGURATION message.

3   CHANGE REQUEST TO 25.331

3.1   CR to section 8.3.1.2

We propose to add the following clarification to TS 25.331 [2], section 8.3.1.2 Radio access bearer release.

"The RADIO ACCESS BEARER RELEASE message can be used to initiate a transition from DCH active to control only substate by using the control only substate timer. The timer is reset after every DCCH uplink or downlink transmission. If the timer expires, the UE shall release the radio link, move to RACH/FACH state and transmit a RADIO ACCESS BEARER RELEASE COMPLETE message. If the timer is set to zero, the intermediate control only state is omitted."

3.2   CR to section 8.3.2

We propose to add the following clarification to TS 25.331 [2], section 8.3.2. Transport channel reconfiguration:

"The TRANSPORT CHANNEL RECONFIGURATION message can be used to initiate the control only substate by using the control only substate timer. The timer is reset after every DCCH uplink or downlink transmission. If the timer expires, the UE shall release the radio link, move to RACH/FACH state and transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE message. If the timer is set to zero, the intermediate control only state is omitted."

3.3   CR to section 8.3.4

We propose to add the following clarification to TS 25.331 [2], section 8.3.4 Physical channel reconfiguration.:

"The PHYSICAL CHANNEL RECONFIGURATION message can be used to initiate a transition from DCH active to control only substate by using the control only substate timer. The timer is reset after every DCCH uplink or downlink transmission. If the timer expires, the UE shall release the radio link, move to RACH/FACH state and transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message. If the timer is set to zero, the intermediate control only state is omitted."

3.4   CR to section 10.1.5.1 PHYSICAL CHANNEL RECONFIGURATION

Information Element	Presence	Range	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Activation time	O			
C-RNTI	C - RACH/FAC H			
Control only substate timer	M			
UTRAN mobility Information elements				

3.5   CR to section 10.1.5.5 RADIO ACCESS BEARER RELEASE

Information Element	Presence	Range	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Activation time	O			
C-RNTI	C –RACH/FACH			
Control only substate timer	M			
RAB information elements				

3.6   CR to section 10.1.5.9 TRANSPORT CHANNEL RECONFIGURATION

Information Element	Presence	Range	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Activation time	O			
C-RNTI	C –RACH/FACH			
Control only substate timer	OM			FFS
Transport Channel Information Elements				

4   REFERENCES

[1]   TS 25.303, v 3.0.0 1999-06, " UE Functions and Interlayer Procedures in Connected Mode ", source: TSG RAN.

[2]   TS 25.331, v 1.2.0 1999-07, "Description of the RRC protocol", source: TSG RAN WG2.