TSG-RAN Working Group 2 (Radio layer 2 and Radio layer 3) ***TSGR2#6(99)929***
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Title: Suspension of DTCH transmission

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1 INTRODUCTION

In this contribution, we propose to add the possibility of suspending DTCH transmission in DCH/DCH state and to delete the control only substate as a separate substate.

2 DISCUSSION ON CONTROL ONLY STATE

Due to the burst nature of interactive data applications, as well as un-predictable delay in the packet network, packet data traffic often consists of a cluster of small frequency packets. The silent period in between these packets can be in the order of seconds.

The control only sub-state included in [1] is a transit state during which most of radio and network resources are released. It is ideal for coping with these silent periods in packet data transactions, since UE still maintains the physical layer connection with the network. This should reduce unnecessary random access attempts on common transport channels, give better interference control, and most importantly reduce end user access delay to high bit rate transport channels.

The control only sub-state restricts transmissions during the transition stage from DCH/DCH to RACH/FACH to DCCH transmissions only, whilst blocking the DTCHs. The benefit of complete release of traffic DCHs is the possibility to release high bit rate transport channels in Iub, thus allowing more efficient utilization of network resource, in addition to the air interface resources.

During recent discussions in RAN WG2 it has been argued that the control only substate can be understood as a transition phase from DCH/DCH to RACH/FACH, which is not, in effect, a separate UE substate. An alternative to retaining the functionality in this substate is to modify radio access bearer control procedures so that the procedures include elements which can suspend and resume DTCH transmission.

3 SUSPENSION OF DTCH TRANSMISSION

3.1 Suspension of DTCH transmission

The UTRAN will suspend DTCH transmission typically in situations where uplink DTCH transmission has ceased. The UTRAN initiates suspension uplink DTCH traffic with one of the following messages:

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

The messages may include an information element "DTCH suspend/resume", which is set to "DTCH suspend".

Having received the suspension request, the UE suspends uplink DTCH transmission and acknowledges the message with the corresponding complete message.

3.2 Resumption of DTCH transmission

The same messages, which can be used to suspend DTCH suspension can be used to configure the status of DTCH transmission as "DTCH resume".

Having received the resumption request, the UE resumes uplink DTCH transmission and acknowledges the message with the corresponding complete message.

3.3 UE DTCH buffer status as trigger to resume DTCH transmission

If suspended DTCH transmission is employed in the network, the UTRAN will request the UE to report DTCH and DCCH RLC buffers separately in the MEASUREMENT CONTROL message. This is done by configuring the information element "Traffic volume reporting quantity" to value "RLC buffer payload for each RAB".

The UTRAN will use the information on the RLC buffer status of suspended DTCHs to determine when transmission should be resumed.

3.4 Downlink data transmission

Downlink data reception in the UE is not restricted with DTCH blocking.

4 CHANGE REQUEST TO 25.303

We propose to remove the control-only substate from TS 25.303 [1].

5 CHANGE REQUEST TO 25.331

We propose to add the following clarification to TS 25.331 [2], 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 state timer~~	~~O~~			~~FFS~~
Logical Channel Information Elements				
DTCH suspend/resume				

We propose to add the following information element to 10.1.5.1 PHYSICAL CHANNEL RECONFIGURATION, 10.1.5.3 RADIO ACCESS BEARER RECONFIGURATION, 10.1.5.5 RADIO ACCESS BEARER RELEASE

Logical Channel Information Elements				
DTCH suspend/resume				

We also propose to add the following sentence to 8.3.1.2 Radio Access Bearer Release, 8.3.1.3 Radio Access Bearer Reconfiguration, 8.3.2 Transport Channel Reconfiguration, 8.3.4 Physical Channel Reconfiguration

The procedure can be used to suspend and resume DTCH transmission on the uplink.

6 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.