

TSG RAN#13 September 18-21, 2001

Tdoc RP-010678

Beijing, China

HSDPA - Physical Layer Status Report

Source: TSG RAN WG1 Chairman, & Rapporteur

General

- Good progress achieved in the WI
- WG1 TR on HSDPA Physical Layer created
 - Ref: Tdoc R1-01-0989 for version 0.0.4
(WG1 approval at the next WG1 meeting)
- Clearly the biggest topic in WG1 in terms of contributions
- Lots of work remains still on finer details

TTI Length & ARQ Issues

- WG1 agreed to have only 1 TTI length i.e. 2 ms (3 slots)

Note this is valid for FDD

For TDD slightly different principles are used with TTI

- On Hybrid ARQ it was agreed that re-transmission (on Layer 1) does not have to be identical, i.e. Incremental Redundancy (IR) can be used.

The terminal memory requirement shall be derived based on Chase (soft) combining i.e. at max data rate (as given by UE capabilities) only Chase combining can be used

Downlink Signalling

- For the signalling following was agreed:

Number of HS-DSCH Shared Control Channels: At least 4 (that a single UE is aware of). (UTRAN can even configure only 1)

HARQ information and TF information to be time-multiplexed (with detailed division TBD, in ARQ part e.g. sequence number)

- Issues to decide:

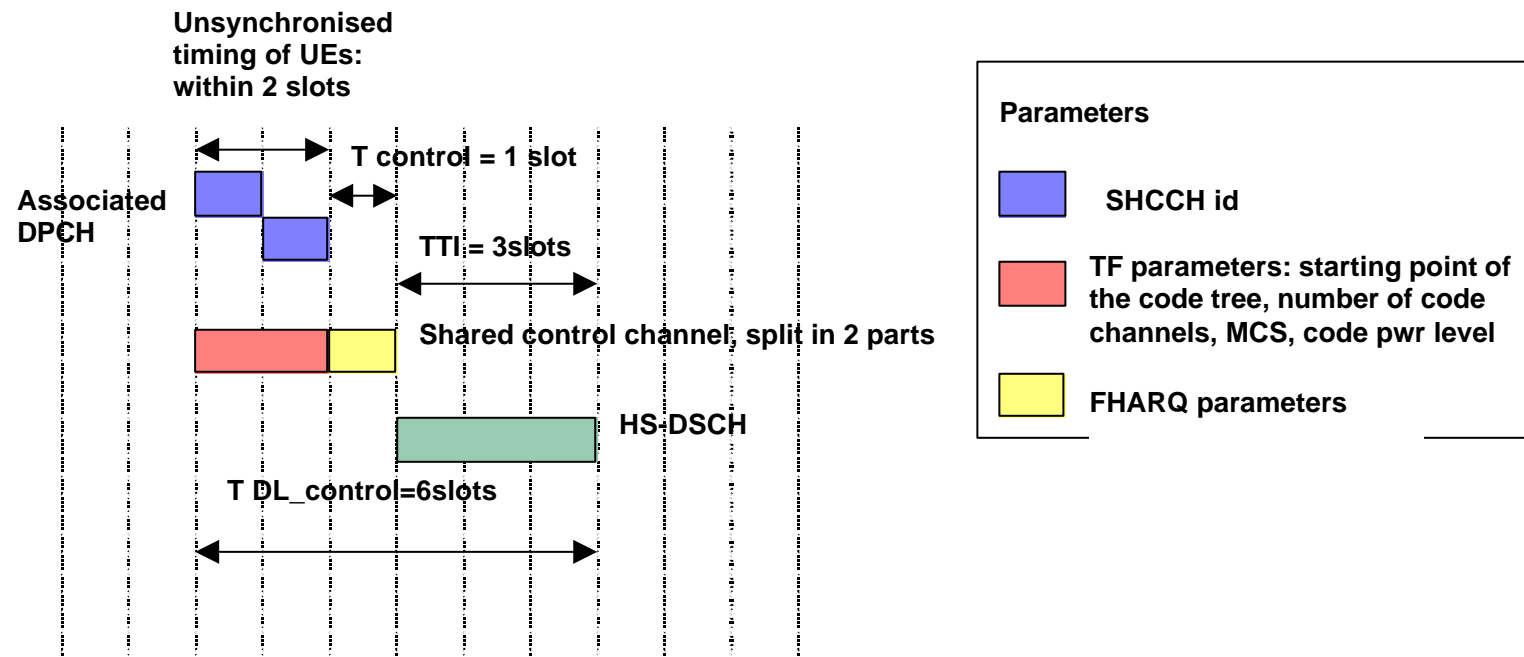
Transmission timing

Where HI (with current assumption as 1 symbol= 2 bits) is transmitted:
(assumed on DPCH)

What is to be included TFI? Is there similar "budget" for bits (in TFI) for HS-DSCH as with Rel'99 DSCH.

Downlink Signaling (Example used in WG1)

- TF and HARQ information time multiplexed to reduce needed processing time
- Timing issues below and also timing between data and uplink Ack/Nack will be discussed in next WG1 further



Modulation Aspects

- The use of QPSK (as in Rel'99) and 16QAM is agreed.
- 8PSK & 64QAM required further discussions

For 8PSK working assumption was, that it is not used,

Discussion resumed considering the imperfections e.g. in amplitude estimation

For 64QAM working assumption is that it is a UE capability (thus not mandatory for any UE class)

The inclusion of 64QAM has been questioned from the performance and complexity viewpoint, also WG4 feasibility comments still pending from the study phase.

Uplink Signaling

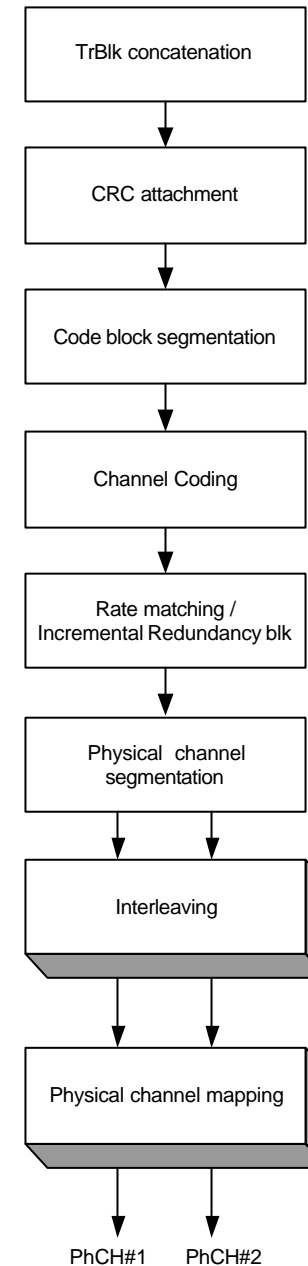
- Uplink signaling on a parallel code with SF 256
- 1 slot ACK/NACK (or DTX) for ARQ purposes. Also soft ACK/NACK has been proposed
- 2 slots either DTX or quality feedback

The inclusion and rate and reported feedback value to be discussed

Views also presented that explicit feedback would not be needed but power control and ACK/NACK information would be sufficient for scheduling purposes.

Channel coding

- Rel'99 1/3-rate Turbo coding to be used, other effective coding rates e.g. 1/4 to be created with rate matching
- Channel coding chain is simplified due:
 - Only one TrCh per TTI
 - Only 1 interleaving step
 - No radio frame segmentation needed
 - No DTX during the TTI



UE Capability

- Proposal made on the reference classes with HSDPA around 2 or 3 Mbits, 7 and 10 Mbits/s
- Also what reference classes from the Rel'99/Rel'4 classes shall be defined what HSDPA parameters to be is to be discussed
- Discussion to continue via email to have more concrete proposal for next WG1.