TSG-RAN
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Bangkok, Thailand

Title:	Comments on LS from RAN WG4 on coexistence of 1.28Mcps TDD and 3.84 Mcps TDD
Source:	Telia AB
Agenda Item:	4.3
For:	Discussion and decision

In the liaison statement from RAN WG4, RP-000524 (R4-000998), RAN WG4 informs TSG RAN of the studies on coexistence of 1.28Mcps TDD and 3.84 Mcps TDD performed by RAN WG4, and concludes:

"Based on the provided results RAN4 concludes that for operation in adjacent bands a further alignment of the physical layer parameters / frame structure between 1.28 Mcps TDD and 3.84 Mcps TDD is not necessary, if operators co-ordinated to ensure both frame and switching point synchronisation."

Here, "if" is a key word, and RAN WG4 supplies a number of documents to exhibit the meaning of their conditional statement.

In R4-COX-005 (annex B in R4-000998) presented at the the RAN WG4 adhoc on TDD coexistence studies it was shown that BS to BS adjacent channel interference will make synchronisation between different TDD operators necessary. As a consequence great concern, for the BS to BS adjacent channel interference, was expressed in the report from the RAN WG4 adhoc on TDD coexistence studies (R4-000956, annex B in R4-000998).
In R4-000972 (annex C in R4-000998) the shortcomings of the usage of incompatible frame structures are clearly exhibited.

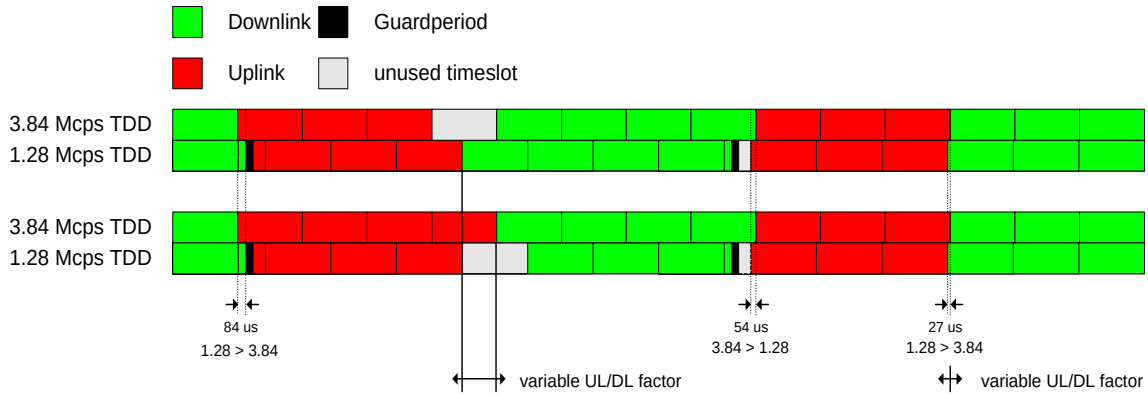

Fig. 1 *Two synchronisation alternatives where either the 1.28 Mcps TDD operator or the 3.84 Mcps TDD operator concede to give up one time slot per frame.*

Trying to synchronise the two incompatible frame-structures as much as possible (see Fig. 1) the result is still deterrent:

- One of the two competing operators has to give up one timeslot per frame
  ⇒ 7% capacity loss
  ⇒ Nightmare scenario for inter-operator co-ordination negotiations.
- Every second UpPTS (1.28 Mcps TDD), used for random access, is killed by interference.
- In addition to the unused timeslot, up to 40% (1.5 dB) of the capacity is lost for timeslots where up and downlink timeslots are partially overlapping (see Fig. 1).

This should be compared to the complete interference suppression achievable with compatible frame structures.

We are now ready to spell out the RAN WG4 conclusion. RAN WG4 concludes that if operators are ready to co-ordinate in the manner described in R4-000972, loosing 7% of the capacity etc, there is no need for further alignment of the physical layer parameters / frame structure between 1.28 Mcps TDD and 3.84 Mcps TDD.

It's quite clear that such co-ordination is not a realistic solution. Operators would not be ready to co-ordinate in such a way. As we see it, TSG RAN therefore has the choice, either to relax the requirements on inter-working between the two modes, or to demand either stricter requirements for ACLR and ACS or further alignment of the physical layer parameters / frame structure between 1.28 Mcps TDD and 3.84 Mcps TDD.

If TSG RAN would choose to relax the requirements on inter-working between the two modes, we would like to see a thorough documentation of the limitations on coexistence, including deterministic calculations of BS to BS and MS to MS interference.

We propose, however, that RAN WG1 and RAN WG4 should be given the task to find a solution to the identified problems.