TSG-RAN Working Group1 meeting #18 TSGR1#18(01)0113

Boston, USA, January, 15th – 18th, 2001

Agenda Item	**:**	**AH24 : High Speed Dowlink Packet Data Access**
Source	**:**	**Nortel Networks**
Title	**:**	**Comments on proposed update of TR 25.848 version 0.2.1**
Document for	**:**	**Discussion**

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1. Introduction

At the end of the last RAN WG1 meeting an update for the TR 25. 848 [1] was prepared by editor but could not be reviewed due to lack of time and the large amount of new material. In this contribution we provide detailed comments on the proposed new text on a per section basis. We also discuss some possible way forward for the handling of the technical report in RAN1 considering that on many aspects leadership is actually within RAN2 and the overall responsibility of the study item is RAN2.

2. RAN 1 and RAN 2 Technical reports co-ordination

There are currently two technical reports regarding High Speed downlink packet data access : a RAN 1 TR 25.838 and a RAN 2 technical report 25.950. The level of progress is different as there is currently quite some text included in the RAN 1 report and the RAN 2 report consists mostly of an outline so far. However some work split was agreed at RAN#9 between RAN 1 and RAN2 in order to avoid re-iterating discussion in both working groups and duplicating documentation.

Reviewing the outline of 25.950 and 25.938 it appears that there are quite a few sections which have the same header, some text being included in RAN 1 report already. These sections are dealing with high level description of the concepts to be evaluated and detailed sections on these same concept. RAN 1 reports contains in addition separate sections on simulation results evaluating some concepts as well as section providing simulation assumptions ands evaluation methodology descriptions. Looking at contributions submitted to RAN 2 it appears that there is also some proposal for these sections for the RAN 2 report, where such proposals are only partly align to RAN 1 text but duplicating most of it. This shows that there is currently some duplication of work and documentation and this is to be sorted out before finalisation of the report that is to take place by the end of the next RAN 1 and RAN 2 meetings for presentation of the report(s) at RAN#11. Some text should be included in only one report and cross reference provided in the other report or both reports should be merged to provide a single RAN1/RAN2 view, meaning that simulation results from RAN1 would be integrated into the RAN 2 report.

At this very meeting it may be difficult to align sections between RAN 1 and RAN 2 reports but some cleaning of the RAN 1 TR could be initiated. Some sections may already be left out of the RAN 1 report at this meeting or significantly simplified just to reflect what was assumed for the simulations as these were clearly assign to RAN 2 according to the work split. We will receive further feed-back from RAN 2 at the time we review this contribution but initial recommendation is as follows :

?? HARQ section should not describe detailed protocol aspects which were allocated to RAN2 but provide a description of what was simulated. It is expected that RAN 2 will very soon describe some proposals in their report so by our next meeting we should be able to make reference to their report with possibly details on how the protocol operation was simulated. Still RAN 1 should present simulation results and address the physical layer aspects, such as complexity; chase combining vs. incremental redundancy and as when we get feed-back from RAN 2 evaluate signalling requirements.

?? Fast cell selection was identified as a RAN 2 topic though it is understood that evaluation is to be provided from RAN1. The related sections should avoid describing detailed operation as there are other aspects but a SSDT operation like process to account for. The section should mostly help to understand simulation results. Detailed description should be left to RAN2.

?? For MIMO, modification of the model of the physical layer in 25.302 should be provided to RAN2. This is where we expect the description of the currently called stream and sub-streams and reuse of the codes could be described. Then this should be referenced to in the RAN1 report and corresponding simulation results retained.

For the other sections high level and detailed concept description, some initial modification of the proposed text could be done and the TR being updated we should provide this to RAN2 so that they can consider including the concept description parts in their own report. This being done RAN1 report may be updated so that these sections only provide reference to it later. In section 3 of this contribution we comment the currently proposed text so that some cleaning is done before providing the TR to RAN2.

3. Comment on proposed update of Technical report

In the present section we discuss the proposal for the updated Technical report in RAN 1 [1]. While doing so we do not necessarily consider whether the text is appropriate for RAN 1or RAN 2 TR but are more addressing the correctness of the description. Comments are provided on a per section or subsection basis. It is our view that

3.1. Comments on section 5

3.1.1. section 5.1 : Adaptive modulation and coding

The text says "The main benefits of AMC are, a) higher data rates are available for users in favourable positions which in turn increases the average throughput of the cell and b) reduced interference variation due to link adaptation based on variations in the modulation/coding scheme instead of variations in transmit power." We understand that power control is disabled as other features such as adaptive modulation and coding as well as HARQ, take advantage of varying propagation and interference conditions. Is that clear though that no form of power control would be allowed, e.g. slow power control in the form of reconfiguration of the transmit power by NodeB or RNC, in a similar way as in R99 Pmax can be changed ?

What is the reference [2] ?

At the end of the section, there is a discussion of the benefits of AMC in conjunction with fast scheduling provided that the scheduling interval (frame size) is short. In general, there should be a separate evaluation and discussion of the benefits of a shorter interval than the R99 10 ms TTI. It is unclear from the description the degree to which AMC is effective if the TTI is not shortened

3.1.2. Section 5.2: H-ARQ

How is this section aligned to the RAN 2 technical report on Hybrid ARQ which is a work item for Release '5. Should not we align both reports starting with the HARQ one and making references to it. It would be beneficial to clarify how HARQ in general and the one in the framework of HSDPA are different from each other.

3.1.3. Section 5.3 Fast cell selection

As indicated earlier Fast Cell selection was identified as a topic for primary interest to RAN2. Though some simulations have already been provided so we may retain a very high level description. Though the current text is not quite appropriate. FCS is in the context of HSDPA very different from SSDT. Whereas SSDT may be seen as a special case of power control, FCS is a lot more than this as this impacts the scheduling, the DPCCH is not transmitted, and RLC and HARQ protocols resynchronisation issues are to be considered. It is our recommendation to simplify the section and reflect mostly what is needed to later understand the simulation rather than reference signalling requirement that according to our understanding may not have been fully simulated.

3.1.4. Section 5.4 : multiple input/multiple output

The current description deals with MIMO for HS-DSCH where there is only one high bit rate HS-DSCH channel assumed. Ultimately a complete model of the physical layer should be provided in a similar fashion as it is in 25.302, RAN 1 making only reference to this. In the mean time we have the following questions/comments on the MIMO operation that the current description could not reflect so far:

?? It is understood that spreading codes may be re-used on different antenna and carrying different flow of information bits. However the UE dimension is not represented in the proposed description. It should be clarified in the description that all sub-stream transmitted from different antenna with the same channelisation code are to be decoded by the same UE (meaning that this is really a form of diversity) or whether it would be possible to have sub-streams with the same channelisation code but transmitted from different antennas assigned to different UE.

when assigned a channelisation code. The latter case would be very costly in terms of decoding for the UE so is probably not what was intended.

?? It should be clarified whether for a given cell, a 4x4 system can be reconfigured for certain UEs into 2x4 when accounting for UE's complexity. Some UEs may not support MIMO either so we will get on a cell level a mixture of cases where MIMO would not be used or used but with possibly different antenna numbers.

3.2. MIMOpplicable to the HS-DSCH channel but to DCHs as well rather than HS-DSCH. Comments on section 6

3.2.1. section 6.2 Adaptive modulation and coding

The text says "HS-DSCH transport format (basically the modulation and coding scheme)". This is not quite in line with RAN 2 terminology that would in any case need to be enhanced for HSDPA. Indeed the TF covers the number of Transport blocks, transport block length, the number of physical channels and physical channels identification.

The text is too specific as to what is the AMC control scheme. Speaking about TF is premature as transport format also included the physical channel allocation if we refer to the DSCH R99. On the schemes described in the proposed text says that one possibility is to have the control UE based and the network has no choice but to assign what the UE request (or not to assign anything). This is not acceptable from a network perspective. So for the time being it is recommended not to provide details as to what the UE should report (TF, MCS or quality) neither discuss whether this is UTRAN based or UE based decision, as this was not simulated exactly as described here.

3.2.2. Section 6. Fast cell selection

This overall section describes fast cell selection in a quite general way. Fast cell selection is the framework of HSPDA is assumed to be a scheme by which the UE select the best cell. It is not quite clear what is meant by best cell. The notion of best cell is indirectly provided in the proposed text by the list of measurement or pieces of information that the UE may use in order to derive such best cell (CPICH RSCP, cell load...). Our view is that rather than says which measurement may be used, the different cases of best cell definition should be provided and the pieces of information to use for each definition should be listed.

Fast cell selection is quite different from Site selection transmit diversity. SSDT is an extreme form of power control but there is no scheduling impact at the node B level. For fast cell selection there is a strong interaction with the scheduling as the MAC is assumed to be in the node B. So if we were to adopt a form of Fast cell selection or equivalently a very fast active set update then control scheme of SSDT is not sufficient.

Then the fast cell selection is applicable when we consider that a form of soft handover is applicable to a HS-DSCH channel which is not the case for the DSCH in R99. Fast cell selection may be seen as an extreme case of handover speed by which the active set is modified quickly and the cell carrying the DSCH for the UE is updated again very quickly.

Simulations have been provided in the meeting to evaluate the gain brought by FCS for various schedulers. So our preference would be to limit the section again to what is the minimum to understand the simulations and possibly list some high level signalling requirement but not go into details on solutions. Further request or guidance on how to evaluate the gain may be received later from RAN 2.

4. References

[1] : Proposed update of TR 25.848 version 0.2.1, Editor

[2] : Status of TR 25.950, Rapporteur, R2-0100019