

TSG-RAN Working Group1 meeting #11

TSGR1#11(00)0356

San Diego, CA, U.S.A., February 29 – March 3, 2000

Agenda Item : AH01

Source : Nortel Networks

Title : **Structure of the Technical report 25.928 (1.28 Mchip/s TDD physical layer)**

Document for : **Decision**

1. Introduction

At the RAN1#10, the work plan within RAN 1 for the introduction of the low chip rate TDD was discussed. A phased approach were agreed, whereby a Technical report was first to be drafted and be ready for review at RAN plenary#8 in June and drafting of change request on existing Specification for R00 or possibly new specification was to start after the RAN#8 meeting. It was mentioned by some parties and reflected in the ad-hoc 1 report that the technical report should provide the background for the technical choices that had been made by CWTS. The technical report should also provide identify commonalities and differencies with respect to the currently standardised TDD mode for R99 along with the rationale for the identified differencies.

A draft outline of the technical report had been discussed in the meeting. It was noted that the outline was very much based onto the structure of the Technical specification. Nortel Networks clearly indicated that this may not be appropriate for a technical report. However in absence of concrete proposal RAN 1 went forward with the proposed outline.

In this contribution, we discuss what in our view should be the content of the technical report, understanding that such a technical report should be a preliminary step for the introduction of a new feature, the end objective being the Stage 3 description (the detailed specification) .

2- General discussion on the content of the technical report

RAN 1 is to provide a technical report on the Low chip rate TDD item. We anticipate that WGs may as well provide technical reports such as RAN 4. RAN may indeed have an RF scenarios Technical report in order to derive the RF requirements of the TDD supporting equipment. Finally RAN 2 already asked for a Stage 2 description, where such a Stage 2 description is to provide the impact on the network architecture, functional split and information flow between the various functional entities within the Access network.

The RAN1, and RAN 4 Technical reports and the RAN 2 stage 2 description should be the entry points for this new feature. They do not systematically need describe all details, as specifications, that we will write in a later stage, would. It should provide a top-down approach in order to allow RAN to understand the various merits of the new feature compared to the existing and what are the requirements that such a new features aims at fulfilling in terms of service to the access network and possible UMTS as a whole, if the services provided by a low chip rate based TDD access network to the core network were different.

RAN 1 scope's is restricted to the physical layer aspects. However in order to get a sufficiently good understanding of the rationale for the physical layer parameters, the Technical report should have a larger scope. We believe that the technical report should contain the following type of information :

- 1) Radio requirements for this modified physical layer compared to wide-band TDD
- 2) High level characteristics of the low chip rate feature
- 3) Detailed description of the proposal and rationale for the layer 1 parameters.

- 4) Analysis of the commonality and differences with the wide-band TDD
- 5) Expected performance of such narrow band mode

2.1 Radio requirements related items

For the radio requirements item, the following sub-items should be provided :

- a) Radio environment to be supported for this modified air interface (Vehicular, pedestrian, macro-cell, micro-cell, fixed wireless access, the range of UE's speed....) and radio environments for which the interface has been particularly optimised
- b) Set of services (or range of services) to be supported in particular the range of bit rates and the source type (sporadic, not sporadic, symmetric, asymmetric services....)
- c) Benefit expected from the new feature in terms of improved performance, cost or operational aspects (such as planning flexibility, gradual introduction of a feature....) with respect to the existing

2.2 High level characteristics

The high level characteristics could be a providing as a table + some extra text indicating the following :

- Chip rate
- Single or multiple frequencies per cell, per UE
- Pilot aided coherent detection
- Modulation schemes (uplink, downlink, allowed combinations of modulations if several are supported on a slot number basis or UE basis depending on service..)
- Reference Receiver types (multi-user, Rake receiver....)
- Burst format (different types, number of burst format per types...)
- Radio frame length
- Number and types of slots per frame
- Uplink/downlink slots
- Channel coding scheme, toll-box approach for the definition of the layer 1 parameters compared to fixed setting....
- Resource unit (smallest amount, biggest amount) and combination or resource unit
- Variable bit rate support scheme
- Packet transmission and constraints on features such as beam-forming
- Power control
- Mandatory/optional activation of specific features
- Synchronisation aspects (inter-cell synchronisation, intra-cell i.e. Timing advance requirement depending on activation of e.g. beamforming)?
- Amount of planning needed ?

- Monitoring capability (how to allow monitoring on other frequencies (TDD, FDD, GSM)).

2. Detailed description

For the item 3 we should have some detailed description of the proposal as well as the background for each physical layer parameter. However should not necessarily be in a specification like style. Indeed some parameters are motivated by the support of e.g. beam-forming.

2.4 Commonalities and differences

For the item 4, we should not just list the difference and commonalities but also justify what motivated that differences appear. This could help us as well to consider adding new features as well to the wide band TDD in future Releases (e.g. 2001).

2.5 Performance

This section should provide the performance achieved with this proposal, for different types of services. The performance should address the link level results as well as system level with capacity figures. The results should in particular show the gain brought by features such as beam-forming, compared to non beam-forming.

3- Conclusion and Proposed modified outline of the Technical report

In the following we proposed a modified outline of the technical report. It proposed that RAN 1 reviews the general content and then considers modification of the existing outline, in line with the new proposed outline. The following proposed outline is a first draft. It is anticipated that many items may be missing but the approach should be retained.

1 Scope

2 References

3 Abbreviations

4 High level requirements

5 Radio requirements

5.1 Radio Access bearers

This section should indicate if there are any differences in terms of radio access bearer to be provided by a UTRAN based on low chip rate TDD compared to FDD and high chip rate TDD.

5.2 Radio bearer

This paragraph in particular indicate which radio environment is supported , and which are the environment for which the air interface has been optimised.

5.3 Handover and cell reselection/reselection requirements

This section should indicate which sort of handover is supported in terms of destination cell (low chip rate TDD/ high chip rate TDD, FDD, GSM 900, 1800, 1900) in particular if different from the existing. We should in particular clarify whether the handover between the two TDD chip rates should be supported.

For the cell selection/reselection, the paragraph should indicate which are the requirements in particular if different from the existing (in particular whether the search priority aspects, which cell type to look for first).

5.4 Operational requirements

5.4.1 Deployment scenarios

5.4.2 Low chip rate introduction

This can describe how the low chip rate can be introduced into an existing network compared to a case where there would be no networks where an existing network can refer to GSM or UTRA-FDD/TDD. In particular we could indicate what is the minimum number of frequencies per cell at introduction, how it can evolve

5.4.3 Network planning

Note : this section should indicate the amount of network planning to be done, what is to be planned....

6 High level characteristics of the low chip rate feature

7 Detailed description of the proposal and rationale for the layer 1 parameters.

8 Analysis of the commonality and differences with the 3.84 Mchip/s

9 Performance analysis of low chip rate TDD