TSG-RAN meeting #22 RP-030576
Hawaii, USA, 9-12 December 2003

Status Report for SI to TSG

Study Item Name: Analysis of OFDM for UTRAN enhancement

SOURCE: Rapporteur (Sarah Boumendil, Nortel Networks) **TSG:** RAN **WG:** 1

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Ref. to SI sheet: RAN_Study_Items.doc

Progress Report since the last TSG (for all involved WGs):

RAN1 #34:

- Several contributions (4) discussing system simulation methodologies were presented. There was an agreement in RAN1 that the HSDPA simulation methodology based on Effective SIR Mapping (ESM) could be applied to OFDM as well, and was an acceptable way forward for this feasibility study. The key element remaining was to agree on an ESM for OFDM.
- 3 contributions addressing the OFDM-CPICH were presented. One text proposal for the structure of this section in the TR was approved. The other two contributions were addressing performance aspects.
- Following a discussion on the inclusion of modulation diversity in the TR as one example of advanced OFDM technology, it was agreed to seek guidance from the RAN plenary on whether advanced OFDM techniques are in the scope of Study Item.
- 3 contributions addressing the UE impact (processing complexity and RF impact) have been re-submitted from RAN1#32. One was covered and the other two were postponed.
- One contribution addressing frequency-domain scheduling and transmit diversity was also presented.

RAN1 #35 (and following email approvals):

- An “exponential” ESM scheme was proposed for OFDM, and two companies presented validation results for this proposal.
- Several text proposals related to a reference system simulation methodology (based on ESM) were approved:
  - Simulation methodology description
  - ESM for WCDMA (Rake and MMSE)
  - Exponential ESM for OFDM
  - Reference AWGN performance (applicable to both OFDM and WCDMA)
- One set of initial system-level performance results (based on the exponential ESM) was presented.
- A set of common link-level assumptions was proposed by a group of 6 companies and approved for inclusion in the TR.
- 5 contributions related to UE complexity were presented. It was concluded that RAN1 needed to agree on a structure for this section of the TR before including text proposals. Such a structure has been agreed upon on the RAN1 reflector following the meeting.
- 2 contributions on the performance of channel estimation based on the OFDM-CPICH were presented. A text proposal on some of these results should be proposed in RAN1#36. Another text proposal on the OFDM-CPICH was also submitted but not covered.
- A text proposal on an OFDM user multiplexing scheme based on a generic Costas sequence has been approved. 3 other contributions addressing OFDM multiplexing with frequency-domain scheduling were submitted but not covered.
- Other contributions addressing mobility and interference modelling were submitted but not covered.
- An answer to the LS sent to RAN4 on higher-order modulations and geometry factors was discussed. It was agreed to reflect the RAN4 guidance in the TR.

RAN4#29

- An LS was received from RAN1 (see above). This kicked off OFDM discussions in RAN4 (suitable geometry and C/I values, UE/node B impairments).
- 2 general contributions were presented : a short introduction to the OFDM technique and a presentation of the status in RAN1.

List of Completed elements (for complex work items):

?? Documentation of OFDM fundamentals
?? Sets of reference parameters
?? Link and system level simulation assumptions
?? Link / system simulation interface (effective SIR mapping)
?? OFDM DL signalling analysis for HS-DSCH
?? Definition of basic OFDM physical channels to support HS-DSCH

List of open issues:

?? Performance evaluation
?? Compatibility and impact evaluation (UE, Node B and UL)
?? Inter-cell interference (modelling and analysis) and related frequency re-use aspects
?? Mobility / handover
?? Synchronisation
?? Advanced antenna systems

Estimates of the level of completion (when possible):

55%

SI completion date review resulting from the discussion at the working group:

RAN#24 (June 04)

References to WG's internal documentation and/or TRs:

[1] R1-031436, TR25.892, Analysis of OFDM for UTRAN enhancement, version 0.5.2.