Status Report for WI to TSG

Work Item Name: Introduction of Multimedia Broadcast/Multicast Service (MBMS) in RAN

SOURCE: Rapporteur, Juho Pirskanen, Nokia   **TSG:** RAN   **WG: 2**

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Ref. to WI sheet: RAN_Work_Items.doc

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

MBMS ad hoc
A MBMS ad hoc meeting was organized on 13th-14th of October between SA1, SA2, SA4, RAN1, RAN2, RAN3, RAN4, GERAN1 and GERAN2 groups in Baden Austria. The intension of this meeting was to clarify SA1 Stage-1 user and bearer requirements of the MBMS and to review RAN and GERAN performance, after these actions the intension was to define "minimal set" of MBMS services. The main issue from the meeting was that defined service requirements were unclear and difficult to meet with current L1 performance in UTRAN and especially in GERAN.

RAN WG1
After the RAN#21 the MBMS discussion RAN1 took place in RAN1 #34 and #35. The simulation result for S-CCPCH performance in with rel5 L1 were included in TR25.803 in RAN1 #34. A LS (R1-031138, R2-032384) was sent to RAN2, SA1, SA2, and SA4, (cc RAN3, RAN4) to inform relevant groups and summarize these results. As a summary when utilizing 64 kbps channel, and 1% BLER target in FDD, a 80-90% cell coverage can be achieved by using 15-20% of Node B transmission power in outdoor propagation environment. By utilizing the STTD the transmission power requirement can be reduced.

Further simulation results were captured in TR25.803 (v1.2.0) in RAN1 #35 and LS (R1-031414) with updated results was sent to RAN2, RAN4, SA1, SA2, SA3, SA4. LS includes the result for 3.84 Mcps TDD as well as clarification on the applicability of some channel models and on the coverage aspects for FDD. The updated results now show that in macrocellular scenario for a 64 kbps service, 80ms TTI and 1% BLER target, 90-95% coverage can be achieved by utilizing 12-30% of the Node B transmission power with out STTD.

In addition, the possible L1 enhancements for MBMS have been discussed without conclusion but a LS was to RAN2 and RAN3 (R1-031428) to further elaborate RAN1 understanding on different requirements.

RAN WG2
Since RAN#21, MBMS discussions in RAN2 took place in RAN2#38 and in RAN2#39 where several agreements was made. These agreements are included to TS25.346 v2.4.0, which is also submitted for information (RP-030653), and can be summarized by following points:

- MBMS notification utilizes the rel99 UE specific DRX cycle and 12 available bits in Rel99 PICH frame in low MBMS load cell. In high MBMS load cell to new PICH can be introduced to the cell. MBMS notification principles are described in chapter 5.1.4 and physical channel in 6.2.3

- MBMS capable UE must be able to receive two S-CCPCHs and one S-CCPCH and one PICH in idle mode, CELL/URA_PCH and CELL_FACH states. It is also required that UE is capable of receiving two PICHs simultaneously in idle mode and CELL/URA_PCH states

- For MBMS User Plane Protocol Stack is concluded that RFC3095 U-mode is used and the number of different protocol entities (PDCP, RLC, MAC) in UTRAN and in UE has been clarified.

- Chapters 6.1 has been re-formatted to separate ptp and ptm channels and to describe ptm logical, transport, and physical channels and appropriate mappings. Terminology harmonized in TS so that MCCH and MTCH are constantly used as MBMS ptm control and data logical channels. FACH and S-CCPCH are agreed to be the ptm transport and physical channels respectively.

- Basic UE actions due to UE mobility agreed and MBMS service information signalling flow enhanced to support these UE actions.

- UEs inter frequency and inter RAT measurements are clarified to have priority in CELL_FACH and in CELL_DCH state over MBMS reception. In Idle mode and in CELL_PCH, URA_PCH states the measurements are performed as configured by the network based on rel5. The MBMS specific measurement occasions to SCCPCH for UEs in idle mode and in CELL_PCH, URA_PCH states are FFS and to be decided in RAN2 #40

- Signalling flow for Broadcast of MBMS System Information created. Also signalling flows for MBMS Joined Services Indication and MBMS PMM-Connected State Required Indication created to solve problem with UEs in RRC connected PMM idle state (UEs having CS call)

- The MBMS access control procedure agreed to establish RRC connection for counting purposes.

- Two tables inserted as an informative annex (Annex <B>: MBMS Control Information) to identify MBMS control information and to describe their mapping on transport channels.

RAN WG3

After RAN#21, MBMS discussions in RAN3 took only place in RAN3#38 as in RAN3#39 only incoming MBMS liaisons was discussed. Changes agreed in from RAN3 #38 can be summarized as:
- MBMS Time line and MBMS Service announcement definitions included based on SA2 definition
- One Context per MBMS Service in CRNC and
- Signalling flow for RNC deregistration updated

List of Completed elements (for complex work items):

TSG SA1: Stage-1 (TS-22.146) has been completed.
TSG SA1: Stage-1 (TS-22.246) MBMS User Services was agreed in SA1 #22 to be sent to SA#22 15th-18th January 03)for approval.
TSG SA2: Stage-2 (TS 23.246) has been completed.

List of open issues:

In RAN1
?? Finalize the L1 point-to-multipoint MBMS issues based on reported results in TR25.803

In RAN2
?? Details on MBMS point-to-multipoint Logical/Transport channel multiplexing.
?? Details of UE mobility and inter frequency and inter RAT measurement in MBMS ptm reception
?? Details of UE capability after L1 decisions
?? Details of Uu signalling

In RAN3
?? Detail UTRAN MBMS signalling flows, (Iur, Iub procedures, e.g. UE linking via Iur).
?? Distribution of Sessions Start
?? De-registrations
?? Signalling of Multicast Service Area

Estimates of the level of completion (when possible):
It can be concluded that the level of completion is 60%, even though number of not presented contributions remains high, and current plan in RAN2 is that the TS25.346 can be presented for approval in TSG RAN #23 in March 04.

WI completion date review resulting from the discussion at the working group:
Stage-2 approved on March 04 so that the Stage-3 work can continue after that.

References to WG's internal documentation and/or TRs:
R2-032384   (R1-031138, to RAN2). LS on Layer1 Performance for MBMS.   RAN1
TR25.803   S-CCPCH performance for MBMS; (Release 6)
R1-031414   LS on updated version of TR 25.803

R1-031428   LS on Physical Layer aspects of MBMS; Response to: LS on Physical Layer aspects of MBMS from RAN WG2 (R2-022711)