LTE-A evaluation by TTA PG 707

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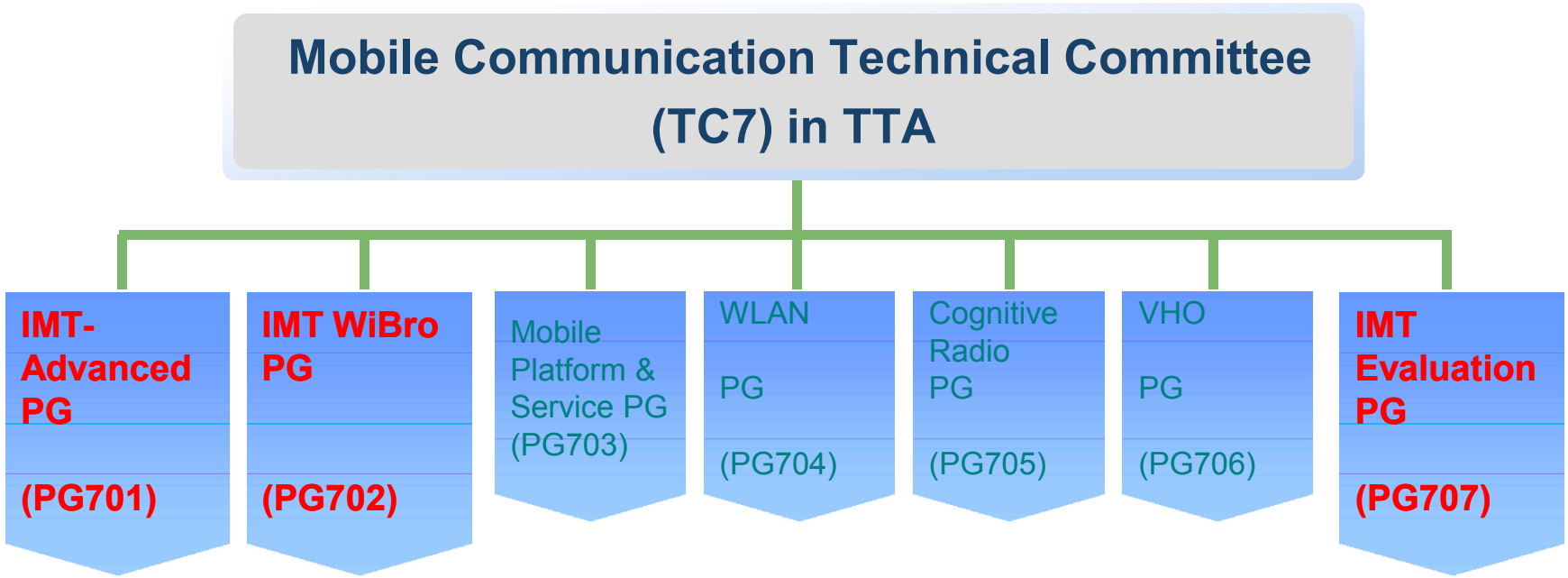
Vice-Chair of TTA PG 707

ToR (Terms of Reference) of TTA PG707

- Evaluate proposals of IMT-Advanced RIT/SRIT
  - Develop evaluation report / Submit evaluation report to ITU-R
- Cooperate and coordinate with other standardization bodies related to evaluation works
  - ITU-R WP5D, 3GPPs, IEEE 802, CJK SIG, SDOs



About TTA PG 707

- **Members**
  - **13 organizations, 47 members**
  - **ETRI, Korea Univ., Samsung Electronics, LG Electronics, TTA, LG Telecom, Intel, KT, Qualcomm Korea, LG-Nortel, RRA, KEIT, Telcoware**
- **Web-site**
  - **http://www.tta.or.kr/English/new/standardization/Committee_newEngList_pop.jsp?commit_code=PG707**
- **Chair**
  - **Dr. Chung HK, ETRI, hkchung@etri.re.kr**
- **Vice-chairs**
  - **Prof. Oh, Seong-Jun, Korea University**
  - **Dr. Kim, Ki-Jun, LG Electronics**
  - **Dr. Cho, Jaeweon, Samsung Electronics**
- **Secretary**
  - **Mr. Choi, Hyoungjin, TTA, ibm686@tta.or.kr**

Activities

- TTA PG707 was set up on July 31, 2008
  - registered as an evaluation group in Dec. 2008

- Activities
  - Regular member meetings to discuss the evaluation issues
  - Harmonization of PG707 members' evaluation works from university, industries and research institute sectors
  - Shaping Drafting Group for Evaluation Reports
  - Cooperation : EVAL SIG in CJK B3G meeting

- Contributions to ITU-R WP5D
  - LLS results / Channel Model C-source codes
  - M.2135 corrections

Work Principle

- **Independent Evaluation Group registered in ITU-R**
  - **Terms of Reference includes**
    - **Evaluate proposals of IMT-Advanced RIT/SRIT**
    - **Develop / Submit the report(s) to ITU-R**
    - **Cooperate and coordinate with other evaluation groups**

- **Complementary Works**
  - **Check if the proposal(s) satisfies the requirements according to the guidelines of M.2135**
  - **May provide complementary evaluation works in order to make sure of evaluation results.**

- **Views on the other group's Evaluation Works**
  - **May provide PG707 views on the evaluation works from other registered evaluation groups, if necessary.**

LTE-A Evaluation Process

- **Full scale evaluation of LTE-A FDD**

- **Contribution based Approach**
  - **Members submit contribution (simulation results)**
  - **On-line/Off-line meetings to discuss the technical issues including detailed simulation configurations**
  - **Evaluation report after the consensus**
  - **For non-simulation results, we validate the self-evaluation report**

Summary of Simulation Results

- In all four configurations (InH, UMi, UMa, RMa), the simulation results show that LTE-A meets the ITU-R requirements
  - Most of simulation configurations and parameters are from 3GPP's self-evaluation
  - For some configurations, Rel-8 features are enough to meet the requirements
  - We try several antenna deployment configurations
- Our numbers are similar to 3GPP's self-evaluation

Indoor Hot Spot (InH) Simulation Results by 2009/12/04

- DL
  - Rel.8 SU-MIMO (4x2) or MU-MIMO (4x2) is used
  - CSE 4.136 or 5.41 bps/Hz/sector, (ITU-R req. 3)
  - CEUSE 0.203 or 0.188 bps/Hz/user, (ITU-R req. 0.1)

- UL
  - Rel.8 SIMO (1x4) or SU-MIMO (2x4) is used
  - CSE 3.2 or 3.91 bps/Hz/sector, (ITU-R req. 2.25)
  - CEUSE 0.241 or 0.265 bps/Hz/user, (ITU-R req. 0.07)

- VoIP users
  - DL (1x2) 125 and UL(1x4) 120 (req. 50)

Urban Micro (UMi) Simulation Results by 2009/12/04

- DL
  - MU-MIMO (4x2 or 8x2) is used
  - CSE of 2.88 or 3.8 (ITU-R req. 2.6)
  - CEUSE of 0.084 or 0.14, (ITU-R req. 0.075)

- UL
  - Rel.8 SIMO (1x4) or SU-MIMO (2x4) is used
  - CSE of 1.88 or 2.24, (ITU-R req. 1.8)
  - CEUSE 0.072 or 0.088, (ITU-R req. 0.05)

- VoIP users
  - DL (1x2) 72 and UL(1x4) 65 (req. 40)

Urban Macro (UMa) Simulation Results by 2009/12/04

- DL
  - MU-MIMO (4x2 or 8x2) is used
  - CSE of 2.25 or 2.86 (ITU-R req. 2.2)
  - CEUSE of 0.063 or 0.11, (ITU-R req. 0.06)

- UL
  - Rel.8 SIMO (1x4) or SU-MIMO (2x4) is used
  - CSE of 1.46 or 1.75, (ITU-R req. 1.4)
  - CEUSE 0.062 or 0.082, (ITU-R req. 0.03)

- VoIP users
  - DL (1x2) 65 and UL(1x4) 70 (req. 40)

Rural Macro (RMa) Simulation Results by 2009/12/04

- DL
  - Rel.8 SU-MIMO (4x2) or MU-MIMO (4x2) is used
  - CSE of 2.68 or 1.95 (ITU-R req. 1.1)
  - CEUSE of 0.107 or 0.067, (ITU-R req. 0.04)

- UL
  - Rel.8 SIMO (1x4) or SU-MIMO (2x4) is used
  - CSE of 1.57 or 2.27, (ITU-R req. 0.7)
  - CEUSE 0.080 or 0.126, (ITU-R req. 0.015)

- VoIP users
  - DL (1x2) 78 and UL(1x4) 72 (req. 30)

Future Work

- **Update the Simulation Results**