

CTIA Certification Program Working Group Liaison Statement

To	Global Certification Forum (GCF) PAG
CC	PTCRB, GCF SG, 3GPP RAN4
Source	CTIA MIMO OTA Subgroup (MOSG)
Subject	LS to the GCF PAG Regarding R4-1611000 (LS to GCF from RAN4 Regarding MIMO OTA Progress)
Date	6 January, 2017

1. Introduction

The CTIA MIMO OTA Subgroup (MOSG) was copied on the recent LS response from 3GPP RAN WG4 (RAN4) to GCF regarding the progress of MIMO OTA in 3GPP [1]. The CTIA MOSG would like to take this opportunity to provide the GCF PAG with additional input concerning this topic.

2. Discussion

In their LS response to the PAG [1], RAN4 noted a number of aspects in which the MIMO OTA test methodology under development in RAN4 and the published test methodology described in the *CTIA Test Plan for 2x2 Downlink MIMO and Transmit Diversity Over-the-Air Performance* [2] (also referred to as the CTIA MIMO OTA Test Plan) are not aligned. The CTIA MOSG would like to provide additional information concerning the rationale behind the CTIA MOSG's decisions to employ certain key aspects of the methodology described in the CTIA MIMO OTA Test Plan which differ from RAN4.

- **SIR controlled vs. a UE noise-limited environment:** The CTIA MOSG chose to use a SIR controlled environment. A SIR controlled environment more accurately reflects the network conditions under which transmission mode 3 (TM3) operation would occur in a live network. An SIR controlled environment is also aligned with the core specifications for TM3 performance evaluation described in 3GPP TS 36.101 and 3GPP TS 36.521-1. In the future, the CTIA MOSG plans to develop a TM2 test that is performed in a noise-limited environment.
- **Urban Macro (UMa) channel model vs. Urban Micro (UMi) channel model:** The CTIA MOSG chose the UMa channel model based on CTIA MOSG Inter-Lab/Inter-Technique (IL/IT) test results which determined UMa to be a better delineator of good vs. bad MIMO devices than UMi. UMa is a more challenging channel model, and consequently, UMa was able to more readily identify MIMO device performance deficiencies. The CTIA MOSG performed a set of IL/IT tests across multiple chamber manufacturers and channel emulator combinations which showed acceptable alignment using the CTIA UMa channel model. The CTIA MOSG would also like to point out that the largest observed difference between MPAC systems using UMa was noted in [1] and was for a device which was tested in one unique orientation. The CTIA MOSG would also note that the data presented in [1] for UMa only

focused on the outliers while the data presented in [1] for UMi was a full data set but may not have had any outliers due to the more benign conditions associated with the UMi channel model. The CTIA MOSG has taken the action to determine if the observed performance differences across MPAC systems for some devices are due to particular test system implementations or if these differences are expected UE performance differences resulting from the challenging UMa channel environment.

- **Coordinate system:** The CTIA MOSG appreciates RAN4's decision to align with the CTIA coordinate system. The CTIA MOSG believes this decision is good for the industry in that it minimizes the possibility that device results will be misinterpreted when reviewing reports from labs using either the 3GPP or CTIA over-the-air test methodologies.
- **3 outage points vs. 2 outage points:** The CTIA MIMO OTA Test Plan currently specifies outage points at 95%, 90%, and 70% of maximum theoretical throughput. The CTIA MOSG agrees with RAN4 that it is preferable to reduce the number of outage points to either one or two. However, the CTIA MOSG has decided that it is prudent to hold off this decision until there is a critical mass of test data from v1.1 of the CTIA MIMO OTA Test Plan (where test results from MIMO-capable devices includes UE performance at outage points of 95%, 90%, and 70%).
- **Test plan availability:** The CTIA MOSG would like to note that the CTIA MIMO OTA Test Plan is publicly available today via the CTIA web site at <http://www.ctia.org/initiatives/certification/certification-test-plans>, and that test lab authorization has started (i.e. test labs are submitting their authorization packages).

3. Actions

None

Contact Info

- Andrew Youtz (Verizon Wireless), CTIA MOSG Co-Chair (Andrew.Youtz@VerizonWireless.com)
- Drew Liszewski (Sprint), CTIA MOSG Co-Chair (Andrew.3.Liszewski@sprint.com)
- Scott Prather (AT&T), CTIA OTA Working Group Co-Chair (scott.prather@att.com)
- Ron Borsato (PCTEST Engineering Lab), CTIA OTA Working Group Co-Chair (ron.borsato@pctest.com)

Date of Next CTIA OTA WG Meetings:

7 February 2017, Teleconference

References:

[1] R4-1611000, *Response LS to GCF on MIMO OTA progress*, RAN WG4.

[2] *CTIA Test Plan for 2x2 Downlink MIMO and Transmit Diversity Over-the-Air Performance*, Version 1.1, August 2016.