CTIA Certification Program Working Group
Liaison Statement

To	3GPP RAN5
CC	PTCRB, GCF SG, GCF CAG, GCF PAG
Source	CTIA Over-the Air (OTA) Working Group
Subject	Use of "Virtual SCell(s)" for CA Testing
Date	20 February, 2018

Introduction

During RAN5 #77 (Reno, NV, USA, 27 November-1 December, 2017), Verizon Wireless presented a discussion paper in R5-176383, "Discussion on Virtual SCell for CA Testing"[1]. According to the draft RAN5 #77 meeting report [2], R5-176383 was noted, but the discussion which accompanied the presentation of the document indicated that the contributors should provide RAN5 with additional insight concerning the application of a "Virtual SCell" concept.

The purpose of this LS is to provide the requested information to RAN5 and to request that RAN5 investigate the use of "Virtual SCells" to reduce the complexity which would otherwise be associated with high-order CA conformance testing.

Discussion

Today, all CA testing specified by RAN5 is executed using a full complement of emulated cells to present the requisite component carriers to the EUT for each CA combination under test. While it's true that this approach to CA testing is technically aligned with the underlying RAN4 CA core and performance specifications, it also requires a significant amount of test equipment hardware as the number of independent component carriers increase. While it's also true that there are ways to simplify the CA test platform's hardware complexity, only so much can be done, and high-order (e.g. > 3 component carriers in separate bands) CA can present test platform scaling issues. Given that the OTA performance is measured on each component carrier individually, CA test platform simplification is possible. Conducted REFSENS test cases for >5 CC could potentially benefit if all CC's were not presented simultaneously.

For radiated tests, the test equipment scaling required to support > 3 component carriers in separate bands is even more significant, as multiple antennas within the test chamber are connected to multiple transmitters on a single network emulator or multiple network emulators. When executing TRS tests during CA operation, the complexity associated with the requisite test platform can result in a higher noise floor within the radiated test chamber, which potentially compromises the validity of the test overall.

Recognizing that the test system complexity associated with > 3 component carriers in separate bands could present significant challenges for radiated CA testing, Verizon recommended in its contribution to RAN5 #77 [1] that the concept of Virtual SCells should be investigated. The advantage of Virtual SCells is that the test platform hardware needn't be any more complex for, say, 5 component carriers in individual bands than for 3 component carriers in individual bands. As CA grows still further in the future with the addition of up to 32 CC CA, LAA and NR, the need to reduce test platform complexity becomes even more important and an urgent industry solution is needed. As the baseline test methodology for NR in FR2 is an OTA setup in a fully-anechoic chamber, many of the same issues with platform

noise will need to be addressed for all CA and/or DC testing.

Actions

CTIA kindly requests that RAN5 review the "Virtual SCell" recommendation described by [1] in the context of its application to any CA conformance test (whether in Clause 6 or Clause 7 of 36.521-1, in addition to Clause 8 of 36.521-3) requiring more than 5 component carriers in individual bands; this concept could be applicable for radiated CA tests requiring more than 3 component carriers in individual bands. Although only a small fraction of these conformance tests have applicability in the context of radiated evaluation of CA performance, CTIA believes it would be beneficial to the industry to reduce CA test complexity wherever possible for both conducted and radiated testing.

References

[1] R5-176383 Discussion on Virtual SCell for CA Testing (Verizon Wireless, AT&T, Dish, Sprint, T-Mobile USA)

[2] R5-177109 Draft Report from the RAN WG5#77 Meeting (3GPP)

Contact Info

- Ron Borsato, Co-Chair, CTIA OTA Working Group (ron.borsato@pctest.com)
- Scott Prather, Co-Chair, CTIA OTA Working Group (scott.prather@att.com)

Date of Next CTIA OTA WG Meeting:

27 March, 2018, Teleconference