Case Study of 802.11a with open-air-interface transmission with simulation methodology

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Abstract - Every technology has two aspects; in open air interface is work as tool which contains application performance and hardware concept. In the real-time application layer 2/3 protocols are implementing and validation with terminology. IEEE 802.11a is approved technology for transmission data over a wireless network. 802.11a is used 5 GHz frequency band and supports data. The hardware device or equipment makes for 802.11a wireless cards at that time. Therefore 802.11b remained more important for next few years. Another one is also used 802.11g which same as 802.11a and 802.11b for wireless and it operates 2.4 GHz bandwidth. Maximum, speed is 54 mbps. These technologies now a day's works on its top speed for ensure your network. To implement of open air interface we together work for investigation better improvement for 5G over the 802.11n which supports wide range and higher wireless transfer rate for this improvement we work for simulation environment which has already two types: Head real time multi CPU deployment and virtual single –CPU deployment. In this paper we work for open air interface structured prototype for changing design and application programming interface to improvement and reduce the cost and time complexity to efficient and effective performance in real time application.

Keywords — 802.11g, 802.11n, Open air interface, OSA, simulation.

I. INTRODUCTION

Open air interface means that a combination of software alliance which is works for non-beneficial consortium fostering a community for cellular and industry, academic resource planning based on 5G technology [1]. It is an open source software and hardware development, this works for access network and user, all types of device (such as mobile, tablet, TV, Computer (EUTRAN)) of 3GPP cellular network. In this we work on off –the –shelf (COTS) hardware [2].

OSA is basically a core into existing in 2014, OSA is a French non-profit organization ("Fond De-Dotation) founded by corporate sponsor. The committee or board include various representative and coordinators from strategic members of the alliance [2]. OSA defines the evaluation of rules and application protocols for wireless (802.11a, 802.11b, 802.11g, and 802.11g) networks. In existing physical layer the technology is 3G -3.5G-4G and other supporting VOLTE, UMTS-LTE and 802.16e/m with coordinating possibility for mesh network with 5G. A regular type of simulator, test beds are used to check the typically network problem with open air wireless.

This is a very crucial phase to check feasibility for this conditioning protocol and application are under construction till now which is fully co-occurrence or co-operate with existing system or physical layer protocol, because the real time based application for wireless is too difficult to manage at the same time, network stack which is easy to configure [2].
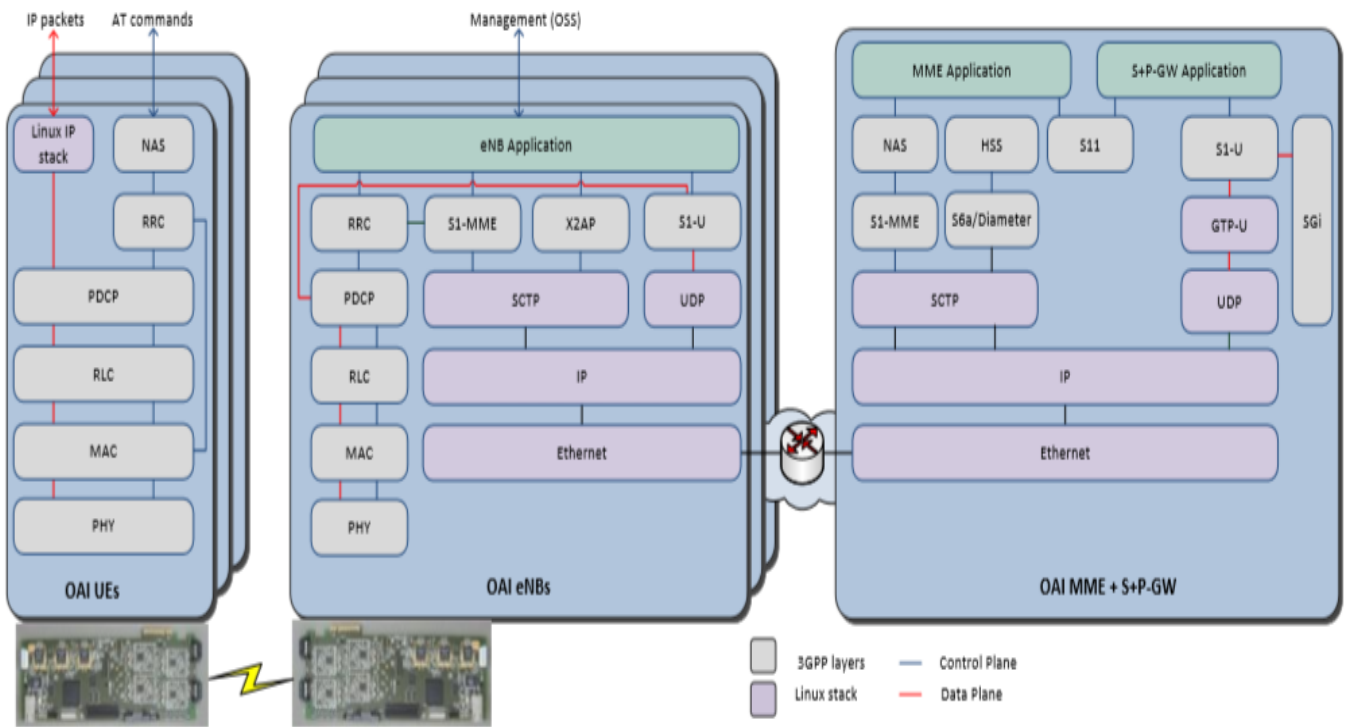
Figure 1: Open Air Interface LTE software stack over Express MIMO2 software radio front-end.

II. OPEN AIR INTERFACE

OAI is open source architecture for mobile data exchange. It is a strict platform which allows prototyping for 4G/5G mobile network. It covers mobile network and convert or developing future oriented and system architecture technologies. Currently various issues are in existing system, after this we reach at the right place to full fill future 5G mobile communication requirements.

OAI is presenting by mobile communication department at EURECOM to activated innovation in the field of mobile/wireless web with network and communication. In mobile technology various basic terms are used (of a Base Station, access point, mobile terminal, core network etc.) with the help of trans-receiver finicality we realized via a software radio front end connected to the host computer for signal processing [1]. There are two types of functionality used for OAI platform:

A. First Function

The phase of open source software that is implementation of the 4th generation (4G) cellular network system that is completely complement and adjustable with 3G/LTE standard and can be work together wireless 802.11a for door/outdoor experimentation and simulation of open air interface.

B. Second Function

This real-time open source software work with built in emulation or predefined simulation over an IEEE 802.11 g capability that can be used for the same. A real Experiment and repeatable is just like seem able transaction between both of them with simulation environment, two physical

layer (PHY) emulation modes are push up/supported at every different level of definition at which PHY is working like a realistic.

III. SOFTWARE CONFIGURATION

Group of hardware which is working for OAI are running open source software. Now a days, OAI platform extended with full software implementation of 4th generation 4G mobile network and work as a complement over 3G LTE standard under real time Linux optimized for X86(64 bit OS) [3].

At lowest connecting layer PHY it provides the following attributes [4]:

1) LTE Release 8.6
2) Wireless 802.11a IEEE Standard
3) Transfer / Transmission Mode
4) TDD and FDD implementation and configuration in 5, 10 And 20MHz (Transmission rate)
5) CQI /PMI reporting
6) DL channels are supported (PSS, PBCH, PCFICH, PHICH, PDCCH, PDSCH, PMCH)
7) UL channels are supported (PRACH, PUSCH, PUCCH)
8) HARQ Supported

IV. HARDWARE

Express MIMO 2 PCI Express Board is OAI software package with default radio format and work for real time world experimentation and technology validation. PCI board finicality is dependent on LEON3 embedded system which totally based on sparten6 LXI50T FPGA as well as chip set of 4 high quality RF [2]. (From LMS6002)
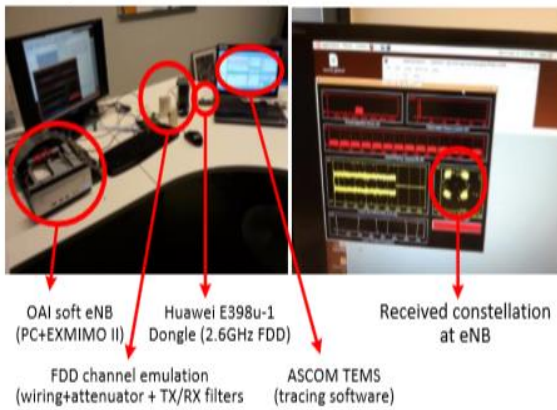
Figure 2: - Configuration of hardware for demo.

V. COMPARISON WITH EXISTING PLATFORM WITH OAI APPROACHES AND STRATEGIES

In existing architecture various alternative simulation hardware and tools are view for highlighting the distinctive prospectus of OAI. Commercial LTE gear (abs, UEs,EPC) are deployed with test beds is for one for the mostly used approach [3]. his is open for access with system experimentation. In case of flexibility it will not provide desired level up to you wants and it is cost effective and expenses [5]. Chip level simulation with 802.11a and OAI is an alternative and most generally used approach in which various system is modulate .Most of the tools are analytical in nature and time complexity has no notation for observation [1].
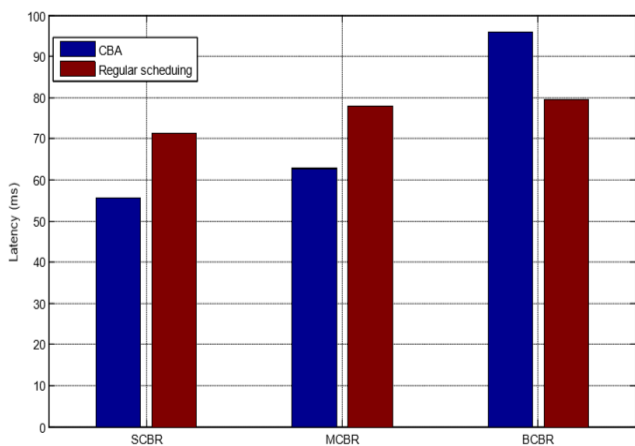

Figure 3:- Measured latency using OAI for contention -base uplink channel access (targeted towards machine-type communication) relative to regular scheduling under three different traffic patterns: small packet CBR (SCBR), medium packet CBR (MCBR) and big packet CBR (BCBR)

OAI regulate the use of SDR related platform for upper level of flexibility and realism [2]. This SDR is getting in increasingly popular followed by OAI. OAI stack implementation is working on real execution environment respective frame timing constraints [4]. One most popular example is LENA (now integrated with NS-3).
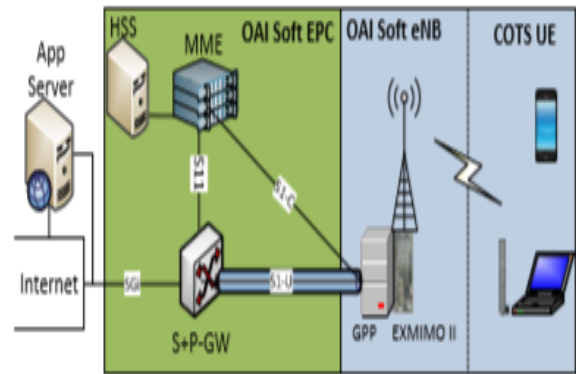
Examples: - 1.LTE-ENB, open-LTE, gr-LTE, OLSD

Figure 4:-Simulation setup and supported Entity.

VI. CONCLUSION

We have discussed 5G research over a wireless 802.11a and other version for same. Open air interface works for best fitted or flexible realistic open source platform for cellular eco system and architecture as well as 4G experimental. 3GPP compliant LTE machine and combined with LTE –A which is subset for real time indoor-outdoor practical simulation and emulation. Recently TASSTA communication and emergency technology accepted and verify to go ahead or LTE deployment for improving communication channel for wireless for two way radio signal processing into 5G networks for users. We focus on the use OAI in the behalf of 5G research direction and trusted that OAI has very much potential to put or become a settable evaluation environment for researcher as well as project development for 5G cellular network. It is also work for innovation through the experimental work in future technology.

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