How 'OpenCells All-in-One OpenAirInterface 5G' creates low bandwidth Mobile Phone Data Networks

By Martin O'Shield of WindyCitySDR
How Software Defined Radio can accelerate the insurance industry!
by Martin O'Shield of WindyCitySDR

Windy City = Chicago
Started the USA's then the World's Mobile Phone Industry: 1G
Member of Open air interface Alliance – France
IBM Global Entrepreneur Program – San Francisco
Intel Tech Provider with Privileged Embedded System Design Membership – Intel Headquarters
IBM Intel Lenovo SSD Innovators TestBed Program – Intel HQ

SDR = Software Defines Radio
One Hardware Platform, Many Wave Forms in Software
New “Physical Layer“ of Wireless Communications
A choice to empower everyone!
Example Picture of a Software Defined Radio Base Station, in grey, versus the gigantic antiquated Brown Nortel “Legacy” GSM Base Station

—Legacy Nortel TDMA BaseStation

—1U General Purpose Computer Server
Running GSM Base Station Software

—Signal processing software written as application level program running on
  • Industry standard servers
  • LINUX or POSIX-compliant OS
  • Standardized RF components

—Advantages
  • Reduced development times
  • Increased flexibility
  • Reuse across hardware and software platforms and generations
  • Enables carriers to upgrade and future proof their networks.
The **OpenAirInterface™ Software Alliance** (OSA) is a non-profit consortium fostering a community of industrial as well as research contributors for open source software and hardware development for the core network (EPC), access network and user equipment (EUTRAN) of 3GPP cellular networks. The Alliance sponsors the initial work of **EURECOM** to create OpenAirInterface™ towards development of 5G Cellular Stack on Commercial Off-The-Shelf (COTS) hardware.
This is a continuum of the outstanding work of Open-Cells Dr. Laurent Thomas' 2017 presentation entitled: OAI eNB Real-Time on Limited-CPU Machine & All in one OpenAirInterface, August 22, 2017 blog post where he outlines issues and modifications he's made to a “OLD” branch of OpenAirInterface (OAI)
“Open-Cell's All in one OpenAirInterface, August 22\textsuperscript{nd}”

Network setup description

Dr. Laurent Thomas stated:

“It’s made a simple configuration for this all-in-one setup”

Each node is on a separate IP address, this address is used for all it’s interfaces. In our case of all-in-one, we take addresses on the loopback: this will be fine on all your machines.

HSS is on localhost: 127.0.0.1

eNB is on 127.0.0.10

MME is on 127.0.0.20

SPGW is on 127.0.0.30
Open-Cell's All in one
OpenAirInterface, August 22\textsuperscript{nd}"

Issues related to CPU power

If you reach performance issues: USRP/UHD prints “LLLLL” or the process exits “problem with samples”, OVERFLOW, …

The first case is to verify the USRP dialogs over USB3 (not USB2): the process must report:

Found USRP B200
-- Detected Device: B200
-- Operating over USB 3.
But OAI works with USB 2.0 SDR devices

When working with USB 2.0 SDR devices:

1. Change these 2 files from “type=B2XX” to “type=USRP1”
   
   openairinterface5g/blob/master/targets/RT/USER/init_b200.sh
   
   openairinterface5g/blob/master/targets/ARCH/USRP/USERSPACE/LIB/usrp_lib.cpp

2. Use a TXCO 30.72Mhz Crystal/Clock on the USB 2.0 SDR (USRP1)

3. Use a “Low” PRB file
I installed @EURECOM 's @osalliance5g #openairinterface5G Framework on a 16GB @Walgreens LiveUSB and tricked it to talk to USRP1 like a B210
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12:26 PM - 5 Oct 2017

2 Retweets 8 Likes
How is this significant?

EURECOM - OpenAirInterface Alliance
SDRs devices are becoming commodities
Re-clocking via External 52Mhz USRP for OpenBTS and SDR GSM Base Station

Condition: Open box
Quantity: 1
More than 10 available / 5 sold

Price: US $149.99
Buy It Now
Add to cart

Best Offer:
Make Offer

1-year protection plan from SquareTrade - $14.99

eBay Money Back Guarantee
Enjoy worry-free shopping on this item. Learn more

Ships from United States

Shipping: $22.05 Expedited Shipping | See details
Item location: San Francisco, California, United States
Ships to: Worldwide

Delivery: Estimated on or before Mon, Jul. 01 to 60613

Payments: PayPal, VISA, MasterCard, American Express, Discover
5G will threaten the mobile competition model (Part 1)
5G threatens the mobile competition model (Part 2)
Goodbye Moto

GOODBYE MOTO
OR HOW CHICAGO’S GREATEST TECH COMPANY FELL TO EARTH
DIY 5G: In the Future, You Might Install Your Own Cell Tower

There's a debate raging in the fixed wireless market, and it boils down to one simple question: Are regular people smart enough to install their own receivers?

Despite that risk, some fixed wireless providers are inching toward a scenario that will test their customers' DIY (do it yourself) capabilities.

https://www.lightreading.com/mobile/5g/diy-5g-in-the-future-you-might-install-your-own-cell-tower/d/d-id/750167
Finish!

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