

Open Source Mobile Network

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Abstract — We present the development and testing of a cellular network built on open source technologies. This network supports voice calls and text messages within the network or between networks. The main objective of this work is to develop a stand-alone mobile network consisting of one base station and a switch, the access to which can be controlled as required. The mobile network is also connected to public networks. The designed network is based on Global System for Mobile Communications (GSM). Our work includes the configuration of the embedded hardware components, selection and integration of the proper software combination, testing of compatible versions of the software, hardware-software integration within the embedded system, and interconnecting the systems via the Internet. The key contribution and novelty of the project is the development of a stand-alone mobile network base station/ switch using the Universal Software Radio Peripheral (USRP) and a Banana Pi device.

Keywords— *Software defined radio, open source, mobile communication, switching*

I. INTRODUCTION

The tendency of creating one's own mobile network using Software Defined Radios (SDRs) has been increasing among the research community as well as in the commercial sector. The main objective of this work is to develop a stand-alone mobile network, the access to which can be controlled as required. The mobile network should be connected to commercial networks.

There are two main components in this architecture. the

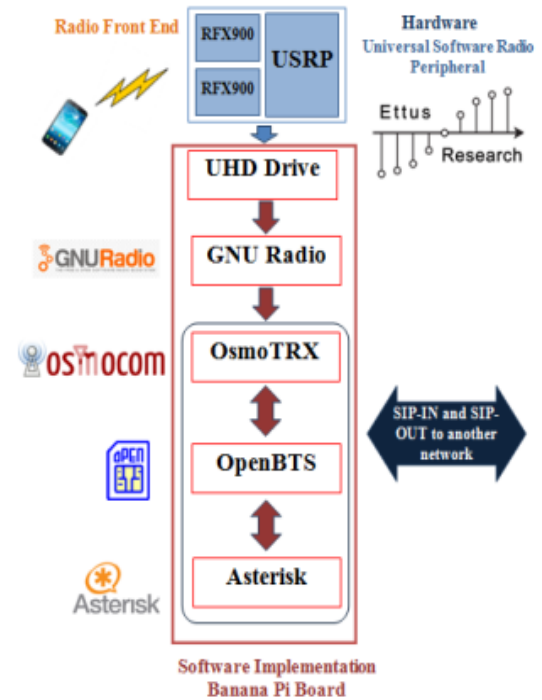


Fig. 1. Overall Network Architecture describing components of Hardware Platform and Software

OpenBTS software is a Linux based application. Also it