MODEM AND AD HOC PROTOCOLS IN SOFTWARE DEFINED RADIO PLATFORM

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ABSTRACT

Ad Hoc wireless network is an infrastructureless emergency network. Each node in an ad Hoc network also serves as a gateway for other nodes in their communication link. Ad Hoc network was originally developed at the tactical network for the war need. Ad Hoc network terminal at the switch can be very random and fastly changes in radio propagation, so the network topology can change very quickly and are unpredictable. To actualize a node that can work for any of the above conditions, a device that is very flexible, dynamic, multistandard, multiservis, multiband, and programmable is highly needed. Software defined radio (SDR) is a technology in which the hardware functions implemented by software. SDR is very suitable to implement the ad Hoc network because of the reconfigurated and re-programmable characteristics to adapt with environment conditions.

Ad Hoc network on an SDR platform is implemented by building a modem integrated with ad Hoc protocol. SDR-based modem-making is an early stage of communication system development. Modem is designed to have very small BER and delay. SDR modems are designed to take advantage of Digital Signal Processor Starter Kit (DSK) for baseband signal processing. In the implementation phase, the DSK is programmed directly using Matlab Simulink integration to build a system of modulation and demodulation Binary Phase Shift Keying (BPSK). Sampling frequency 32000 kHz is used with bit rate of 1 kbps.

In the study also designed a protocol komunikasi ad Hoc. protocol is designed for communication with a low rate. Packet header format is designed with the small to save on bandwidth usage.

Key words: ad Hoc, digital signal processing, Software defined radio