The Physical Layer Integrity Check in Wireless Relay System combining with Cryptography

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ABSTRACT

The wireless relaying system has been widely applied to many networks scenarios such as distributed sensors and cooperative diversity in nodes group. Instead of achieve integrity by merely transmitting unbreakable encrypted messages, many physical layer approaches have been developed. So a physical layer integrity check scheme is proposed in this paper for wireless relay system, where a source broadcast the signals to both destination target and an untrustworthy relay node. The approach exploits physical layer signal to detect the modified messages conducted by the relay. We develop a scheme that utilize a few cryptography information in the initial message packets to estimate the optimal detecting threshold. By using the optimal detecting method, the proposed approach achieves almost same performance provided by perfect cryptography strategy that can detect all the modified messages but with a high computational cost by applying cryptographic encryption to all the transmitted messages.