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Title: [IDS modelling and evaluation in WANETs against black/grey-hole attacks using stochastic models](#)

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Abstract: The aim of this paper is to model and evaluate the performance of intrusion detection systems (IDSs) facing black-hole and grey-hole attacks within wireless ad hoc networks (WANETs). The main performance metric of an IDS in a WANET can be defined as the mean time required for the IDS to detect an attack. To evaluate this measure, two types of stochastic models are used in this paper. In the first step, two different continuous time Markov chains (CTMCs) are proposed to model the attacks, and then, the method of computing the mean time to attack detection is presented. Since the number of states in the proposed CTMCs grows rapidly with increasing the number of intermediate nodes and the attacks which should be done by a single node to trigger the IDS to detect an attack, stochastic reward nets (SRNs) are exploited to automatically generate the proposed CTMCs in second step.

Keywords: IDS; intrusion detection system; black-hole attack; grey-hole attack; Markov chain; SRN; stochastic reward net.

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