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SenLeash: 一种无线传感器网络虫洞攻击约束防御机制

SenLeash: a restricted defense mechanism against wormhole attacks in wireless sensor network

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中文关键词: [无线传感器网络](#) [虫洞攻击](#) [邻居发现](#) [路由发现](#) [RSSI](#) [接收概率](#)

英文关键词: [wireless sensor network](#) [wormhole attack](#) [neighbor discovery](#) [route discovery](#) [RSSI](#) [receiving probability](#)

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中文摘要:

针对邻居发现或路由发现阶段可能受到虫洞攻击的问题,提出了一种约束防御机制SenLeash,通过限制消息传输的距离来防御虫洞攻击。SenLeash依赖2个因子:每个节点到初始基站的距离和一个精选的接收距离阈值。基于接收信号强度RSSI,提出了一种nRSSI测量方法,在网络初始化阶段用来测量每个节点到初始基站的距离。基于每个节点的接收概率和MAC层的最大重传次数,对接收距离阈值的选择方法进行了研究。实验结果表明,SenLeash可有效减少由虫洞攻击导致的虚假邻居节点个数和无效回复消息个数。

英文摘要:

The problem of wormhole attacks during neighbor discovery and route discovery phase was studied and a restricted mechanism, SenLeash, was presented to restrict the transmission range of messages and hence prevent wormhole attacks in WSN. The SenLeash depends on two factors: the distance of each node to an initial sink node and a chosen receiving distance. To obtain the distance of each node to an initial sink node, a RSSI-based measure method nRSSI was proposed. Considering the receiving probability of each node and the maximum retransmission times of the MAC layer, the method of choosing an appropriate receiving distance was discussed. The simulation results demonstrate that the SenLeash can effectively decrease the number of invalid neighbor nodes and invalidly reply messages caused by wormhole attacks in WSN.

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