



Adjusted Location Privacy Scheme for VANET Safety Applications

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Abstract—The primary aim of Vehicular Ad hoc NETWORKS (VANET) is to enhance traffic safety by enabling frequent broadcasting of location information between vehicles. In VANET safety applications, a vehicle requires to broadcast messages, which usually contain its location information, every (1-10 Hz) with other vehicles in its communication area (300m) to facilitate cooperative awareness. This would arise privacy issues because vehicles are vulnerable to tracking attacks via their locations. To prevent long-term linking, many privacy schemes have adopted a silent period in which a vehicle stops sharing its locations for a period. However, silent periods could have a negative impact on safety applications as an accident could have happened if a vehicle stop sharing its locations with other neighbours. Thus, in this paper, we first discuss three privacy schemes (RSP, SLOW and CAPS), which adopted silent periods but in different concepts. Then, we improve the privacy and safety level of CAPS. A privacy simulator PREXT is used to evaluate and compare the performance of schemes.

any VANET applications. An adversary can utilize multi-target tracking techniques to link between messages and track vehicles continuously via its spatiotemporal information [6, 7].

Thus, a vehicle is recommended to stop sharing safety messages (i.e. its location) via entering a silent period. However, VANET safety applications need continuous updating of location information to work properly which could be hindered due to these periods. An acceptable balance between privacy and safety has challenging researchers who have designed privacy schemes depending on silent periods.

Thus, in this paper, three well-known privacy schemes (SLOW [8], RSP [9], and CAPS [10]) have been compared. Then, improving the efficiency of CAPS by adjusting the minimum silent period, which could improve the safety level as well.

The rest of this paper is organized as follows: in section II

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