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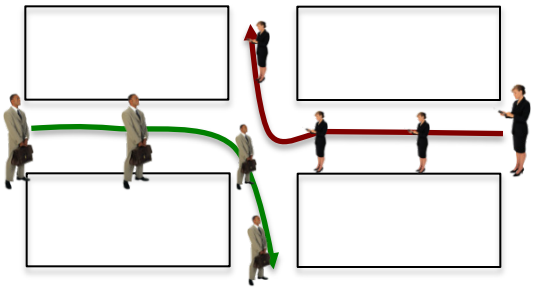
Exposing your whereabouts safely

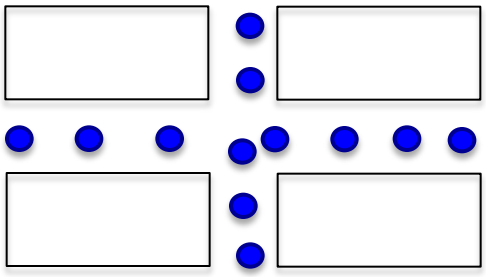
Location privacy using pseudonym exchange

***Abstract*— Many people are expecting that the use of location data collected from mobile devices will result in various fascinating services. But on the other hand, the privacy of mobile users must be appropriately protected. As many people realize, there is a trade off between the utility of location information and the protection of location privacy. We propose a pseudonym scheme called pseudonym exchange that enables us both to protect long-term location privacy, and to retain some of the statistical utility of short-term location information. The pseudonym exchange is a dynamic pseudonym scheme that exchanges multiple users' pseudonyms only when they meet at the same location. We presented an efficient algorithm for verifying the privacy of the scheme.**

Individuals are completely distinguishable



All identifying information is removed



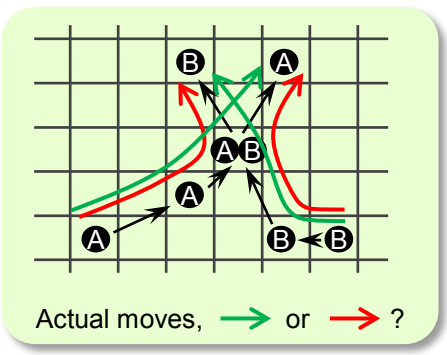
Enables flexible services, no location privacy protection

Trade-off

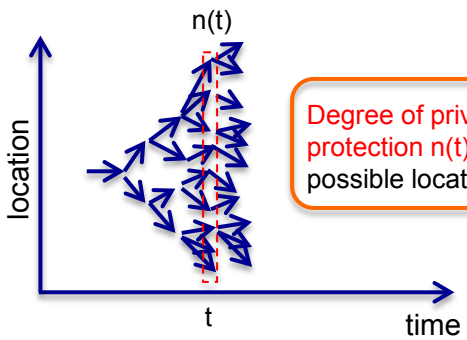
Perfect protection of privacy, loss of service flexibility

Balancing technology: Pseudonym exchange

Pseudonym Exchange: exchanges multiple users' pseudonyms only when they meet at the same location.



Privacy protection by pseudonym exchange: Each time a user meets another, the number of possible locations that an adversary may expect increases.



Related works

[1] K. Mano, K. Minami, H. Maruyama, "Protecting location privacy with K-confusing paths based on dynamic pseudonyms," in *Proc. 5th IEEE International Workshop on Security and Social Networking (SESOC)*, 2013 (to appear).

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