



PRIVACY-AWARE INFORMATION BASE IN THE CONTEXT OF SMART CITIES

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INTRODUCTION AND OVERVIEW



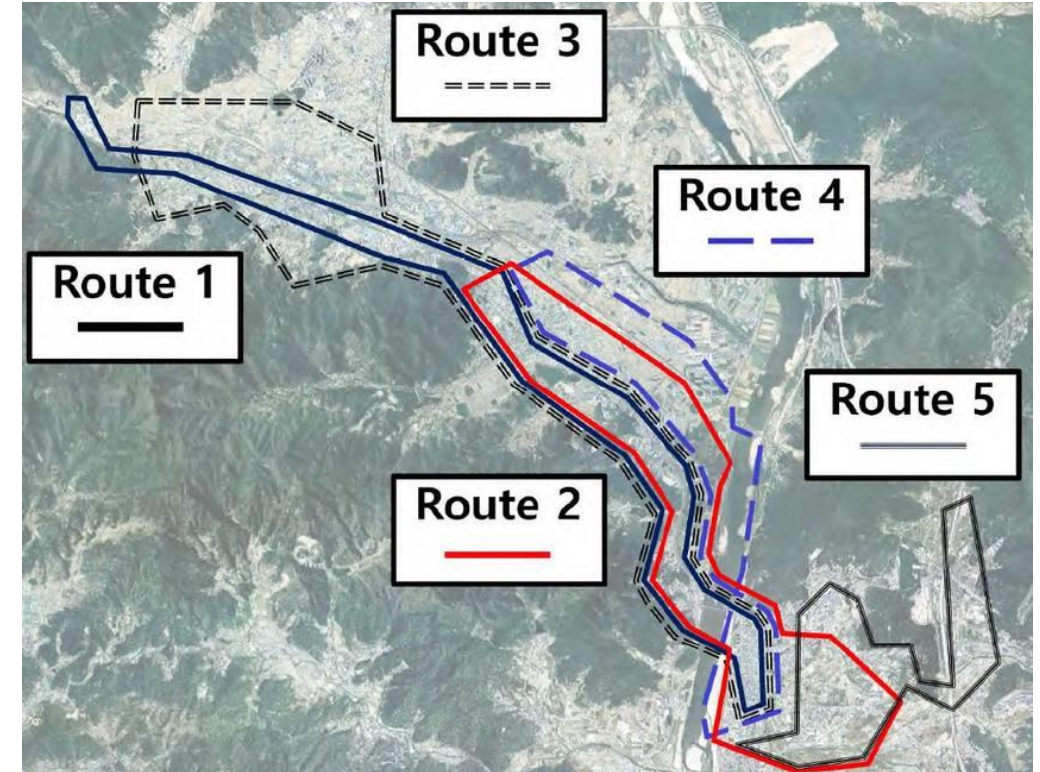
- GOEASY project: What is it about?
- In smart city context, understanding mobility behavior of users is key to the optimization of public transportation services thereby reducing traffic, as well as impact on environment
- Challenge: to protect user privacy in geolocation data while providing dependable location-based services
- Our response: privacy-aware information base that utilizes Galileo authentication to enhance the security and reliability of location-based services



PRIVACY-AWARE INFORMATION BASE



- Privacy-aware information base for mass-market Location-based Services (LBS)
- User data including geolocation/routes is gathered for use by LBS providers as well as mobility managers
- User location data to track routes through the city and mobility modes
- Pollution condition modeling for healthy route selection



https://www.researchgate.net/figure/Public-bus-transportation-lines-consisting-of-multiple-routes_fig2_319171159

IMPLEMENTATION APPROACH (1)

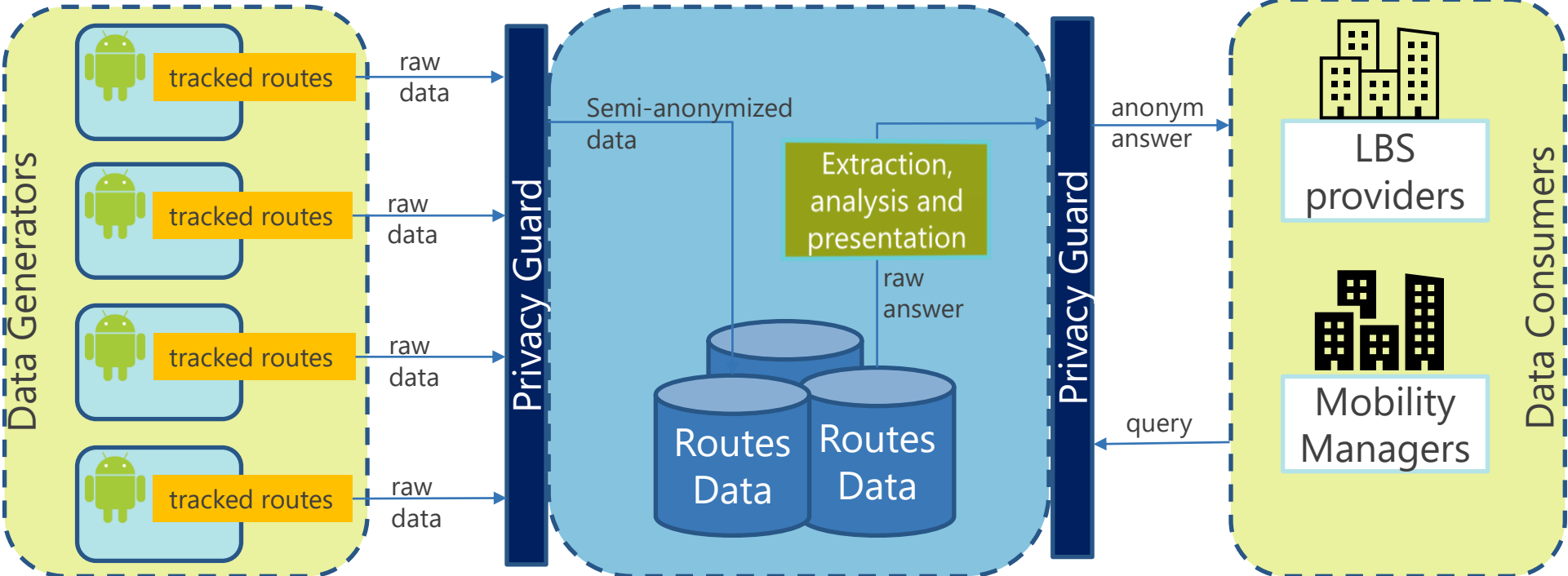


- Ensuring privacy of data subject is an important issue for any data-intensive endeavors
- In order to ensure privacy of users, we have followed various implementation options
 - Detaching Personally Identifying Information (PII) from the data during collection, e.g., protecting device ID through local differential privacy
 - Data minimization when sharing data to third-party
 - Protection k-anonymity of user location through global differential privacy by pumping noise.

IMPLEMENTATION APPROACH (2)



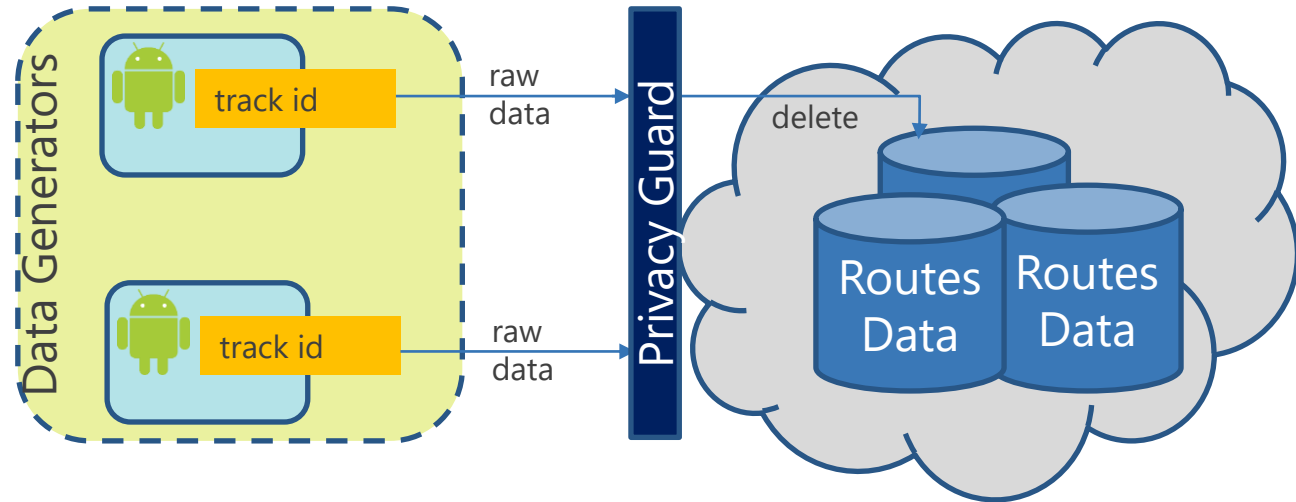
- Tracked routes are sent to the GOEASY Platform and PII data such as device id are obfuscated before storage
- Time and space dimensions separated to reveal as little data as possible
- Differential privacy enabled location data collection, while reducing the risk of revealing the identity



CHALLENGES



- Privacy-preservation versus data usefulness.
- Enabling users to exercise their “right to be forgotten” (GDPR Article 17) so that they can delete their information whenever they want to
- Lack of generalized methodology to measure compliance of privacy technique for geolocation data
- How much noise to add and where: start, mid or end of the tracked routes





THANK YOU!



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