## Goals

- Mobile smart meters installed on electric cars obtain latest pricing information directly from utility office.

- Utility office can send personalized information to and accurately bill electric car.

- Design secure routing protocol for communication between mobile smart meters and central utility office.

- Design secure storage scheme to store information collected by meters.
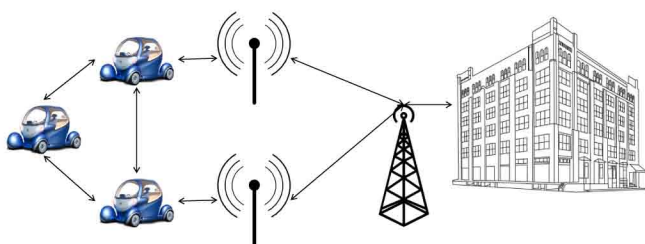
Challenge I: Secure Communication

- Secure communication between meter and utility office.

- Secure communication over hybrid networks: cellular, Wi-Fi, wired.

Secure Communication?

Secure Communication?

Network

Secure Storage?
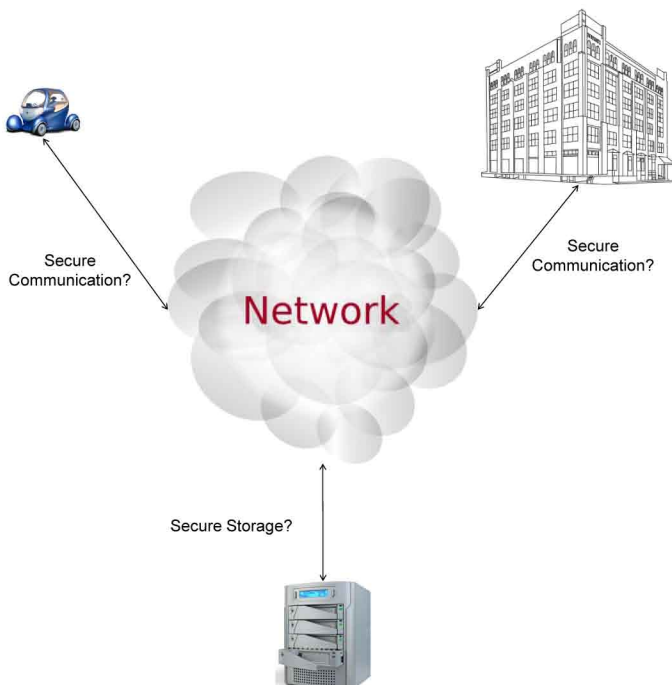
Challenge II: Pricing Optimization

- What information does meter need to know?

- What optimization algorithm to use?

$11 $5 $7

Approach I: Secure Geographic Routing

- Comparative study of secure routing protocols in mobile ad hoc networks.

- Authentication mechanism to identify meter?

- Unified secure routing protocol across various network types.

- Hierarchical routing to mitigate scalability issues.

- Validation through simulation.

Approach II: Local Optimization

- Comparative study of pricing models.

- Location determination and validation.

- Quality of optimization results vs. amount of information available.

Interaction with Other Projects

- Secure password exchange.

- Efficient peer-to-peer communication between mobile devices.

Broader Impact

- Accurate monitoring and easy tracking of energy usage.

- Flexible pricing model.

- Flexible energy exchange.