Robust and Anonymous Information Sharing among Autonomous Vehicles

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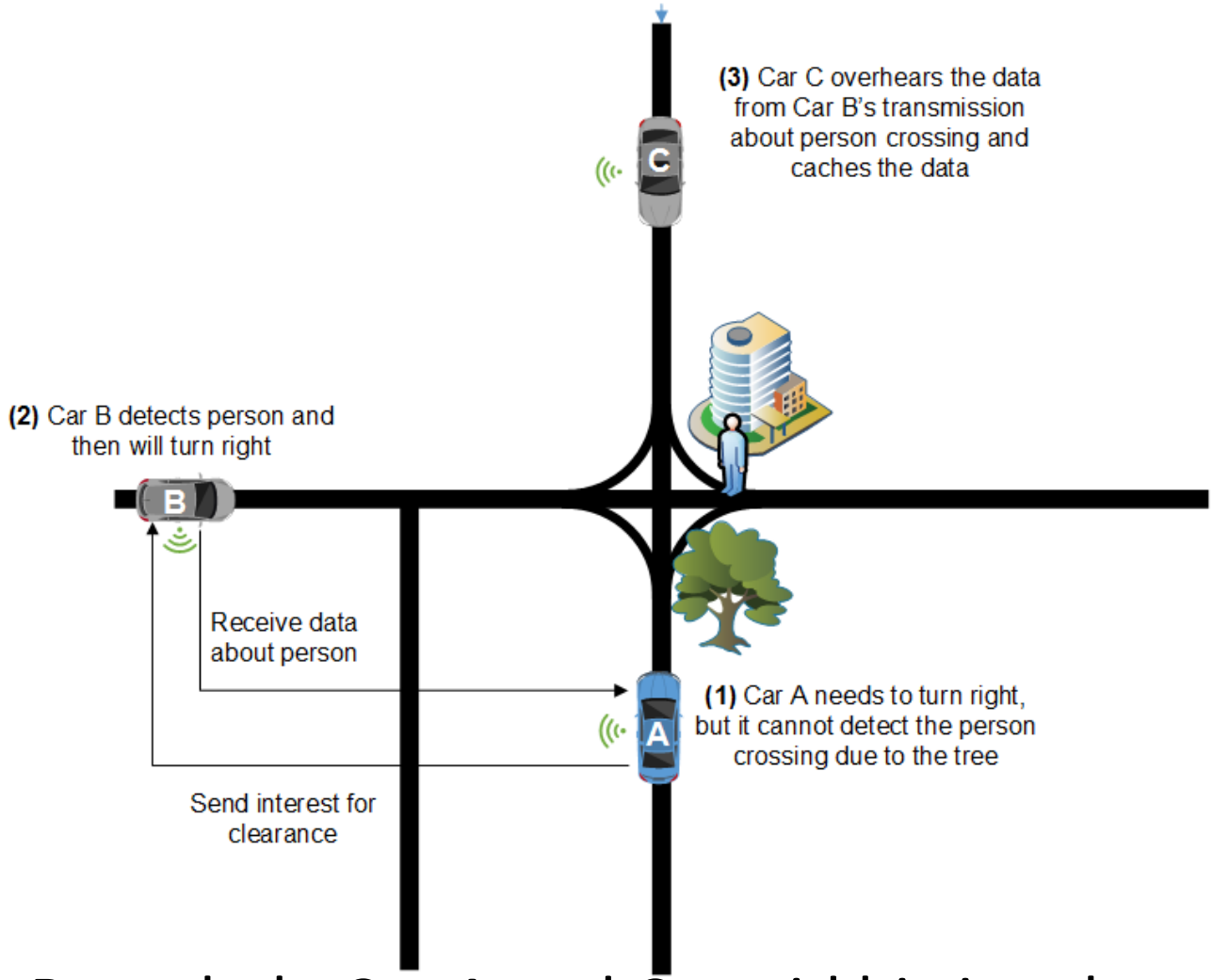
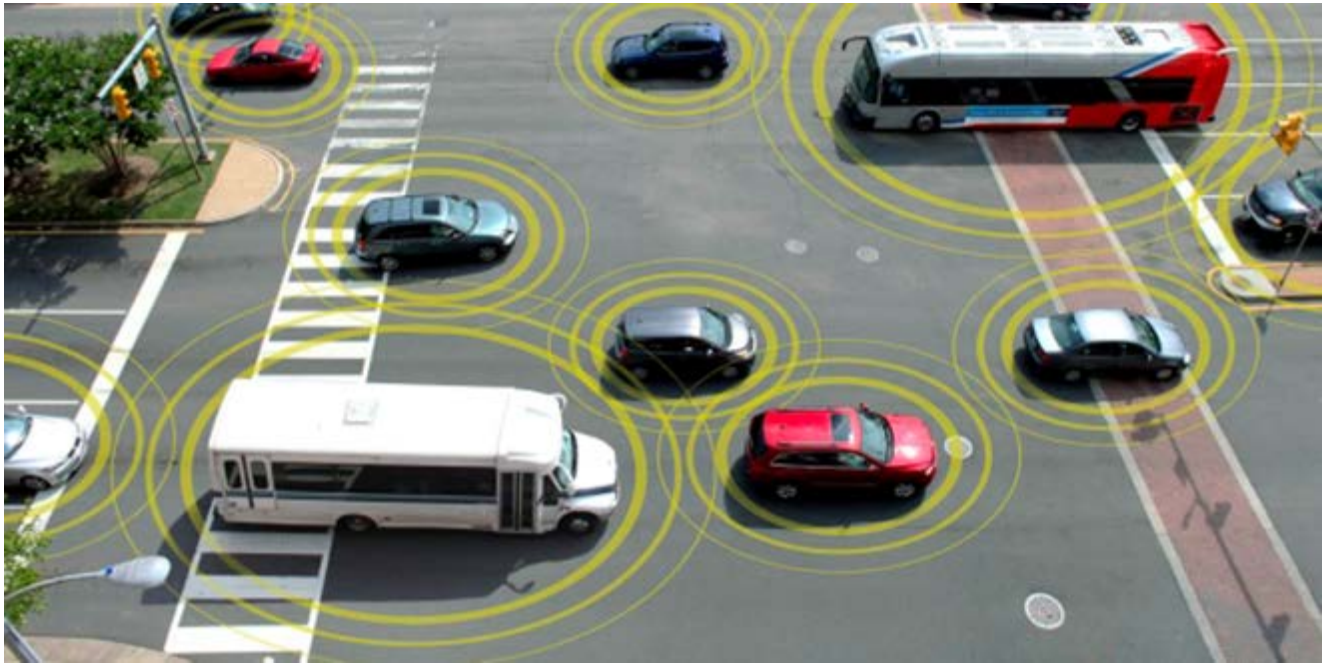
Autonomous vehicles need reliable, trustworthy real-time data



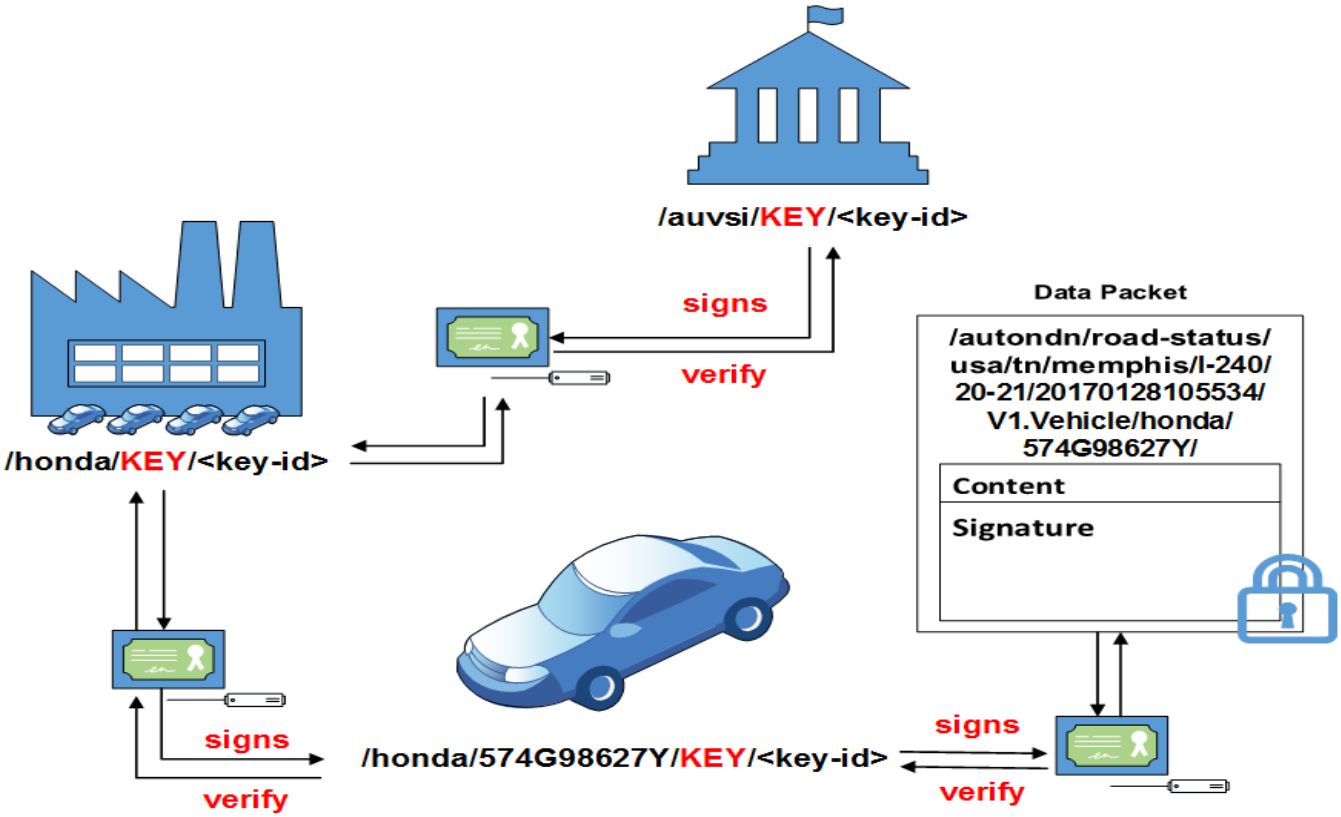
Car B can help Car A and C avoid hitting the pedestrian.

Potential Problems



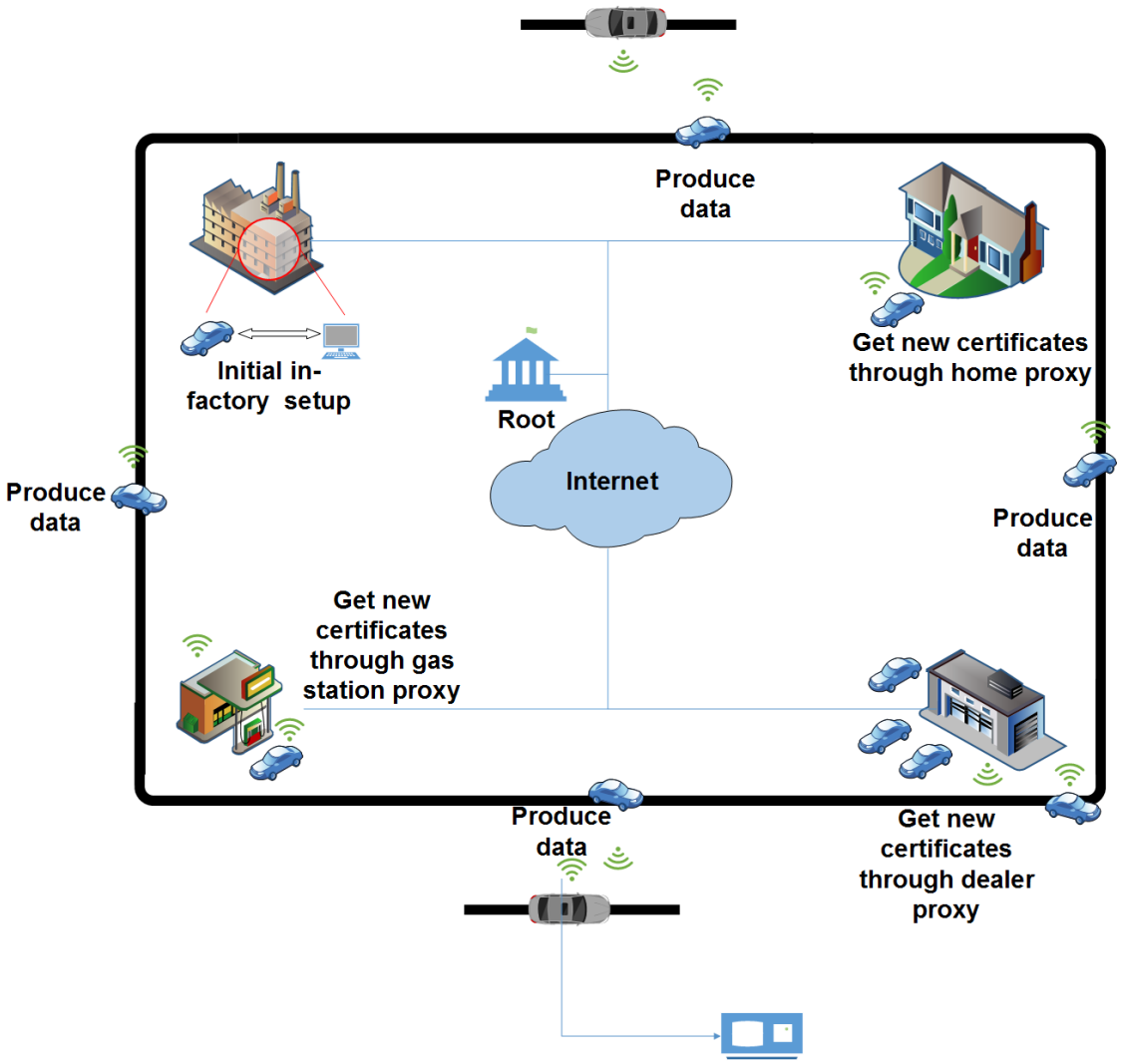
- Unreliable wireless links
- Data may not be trustworthy.
  - “I saw an accident at Poplar and White Station”???
- Privacy: can a packet-sniffer track the vehicle?

Authentication



- Trust Model
  - Data -> Vehicle's key -> Manufacturer's key -> Root Organization's key

How to prevent tracking?



Proposal: use pseudonyms.

Cars fill up pseudonyms at home, gas stations, and dealers.

How to prevent tracking? (cont'd)

- New pseudonym requires new certificate from manufacturer.
- Certificate issuance process can reveal information (who is your manufacturer).
  - The process should be anonymized as well.
- Certificate Issuance proxy will request cert on behalf of vehicle.
  - Communication between proxy and vehicle is encrypted.