5-Anon

Data Privacy for Connected Vehicles

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Data Misuse and Regulation

- Case of Wrongful Arrest
  - LEO Summon Geofenced Records

- Presidential Executive Orders
  - Safeguarding Privacy under reproductive health care services

Car Manufacturers NEED to reduce the Privacy Gap between the Data collected and Identity of Car Owners

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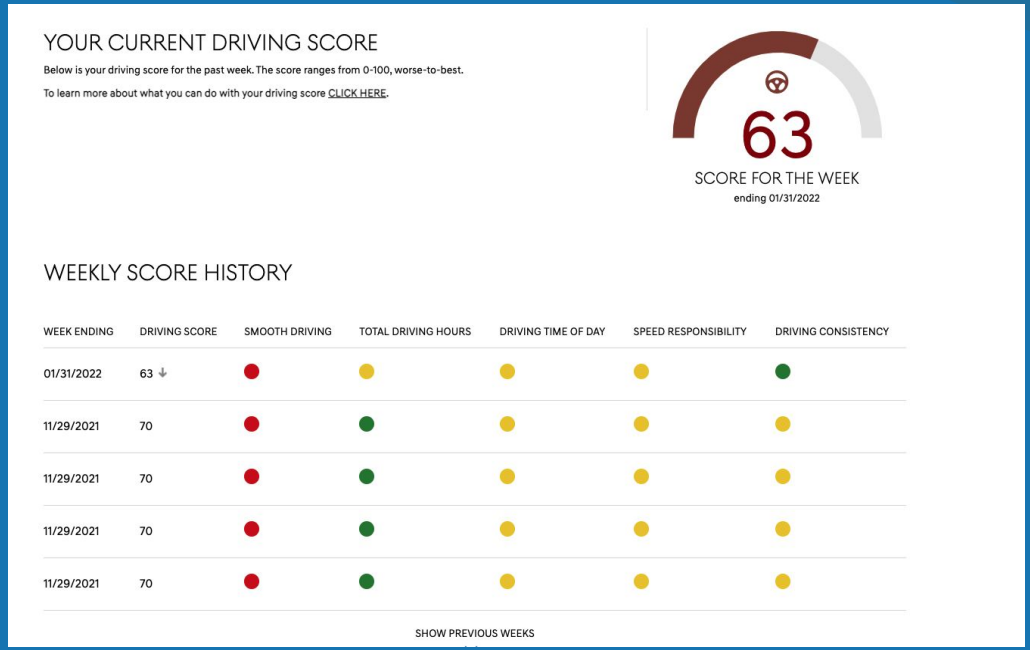
Connected Vehicles & Privacy Concerns

- Connected Vehicles
  - Computer and Software Driven
  - OEM can collect various data from vehicles over-the-air!
- Data Utilization
  - Car Manufacturers:
    - R&D
    - Metrics for Customers
  - Third Parties:
    - Data Brokers
    - Service Providers



YOUR CURRENT DRIVING SCORE

Below is your driving score for the past week. The score ranges from 0-100, worse-to-best.

To learn more about what you can do with your driving score CLICK HERE.

63

SCORE FOR THE WEEK

ending 01/31/2022

WEEKLY SCORE HISTORY

WEEK ENDING	DRIVING SCORE	SMOOTH DRIVING	TOTAL DRIVING HOURS	DRIVING TIME OF DAY	SPEED RESPONSIBILITY	DRIVING CONSISTENCY
01/31/2022	63 ↓					
11/29/2021	70					
11/29/2021	70					
11/29/2021	70					
11/29/2021	70					

SHOW PREVIOUS WEEKS

What can vehicle manufacturers do to raise confidence in vehicle owners about their data privacy?

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How can Privacy be Addressed?

- Encryption != Privacy Compliance
  - Reversible
  - Backdoor access
  - Insider Threat

- Hashing = Pseudo-Anonymization
  - One way and irreversible
  - Susceptible to patterns
  - Brute force and Replay attack

How can Privacy be Addressed?

Anonymization Techniques

- Data Swapping
- Generalization
- Data perturbation

Technique	Raw Data	Processed Data
Data Swapping	t1={2,5,8,9} t2={11,23,1,7,10}	t1={2,11,1,5} t2={11,8,23,7,9,10}
Generalization	18 mpg	15 - 20 mpg
Data Perturbation	58 mph	2*58mph + 10 = 126 mph

5-Anon

End-to-end data anonymization software development kit (SDK)

- Privacy Analyzer
  - Calculates privacy metrics - probability of disclosures
  - Executes on Server/Storage end
- Parameterization Processor
  - Creates rules for data anonymization
  - Executes on Server/Storage end
- Anonymization Processor
  - Applies the rules on the data making it anonymous
  - Executes at the edge

Demo

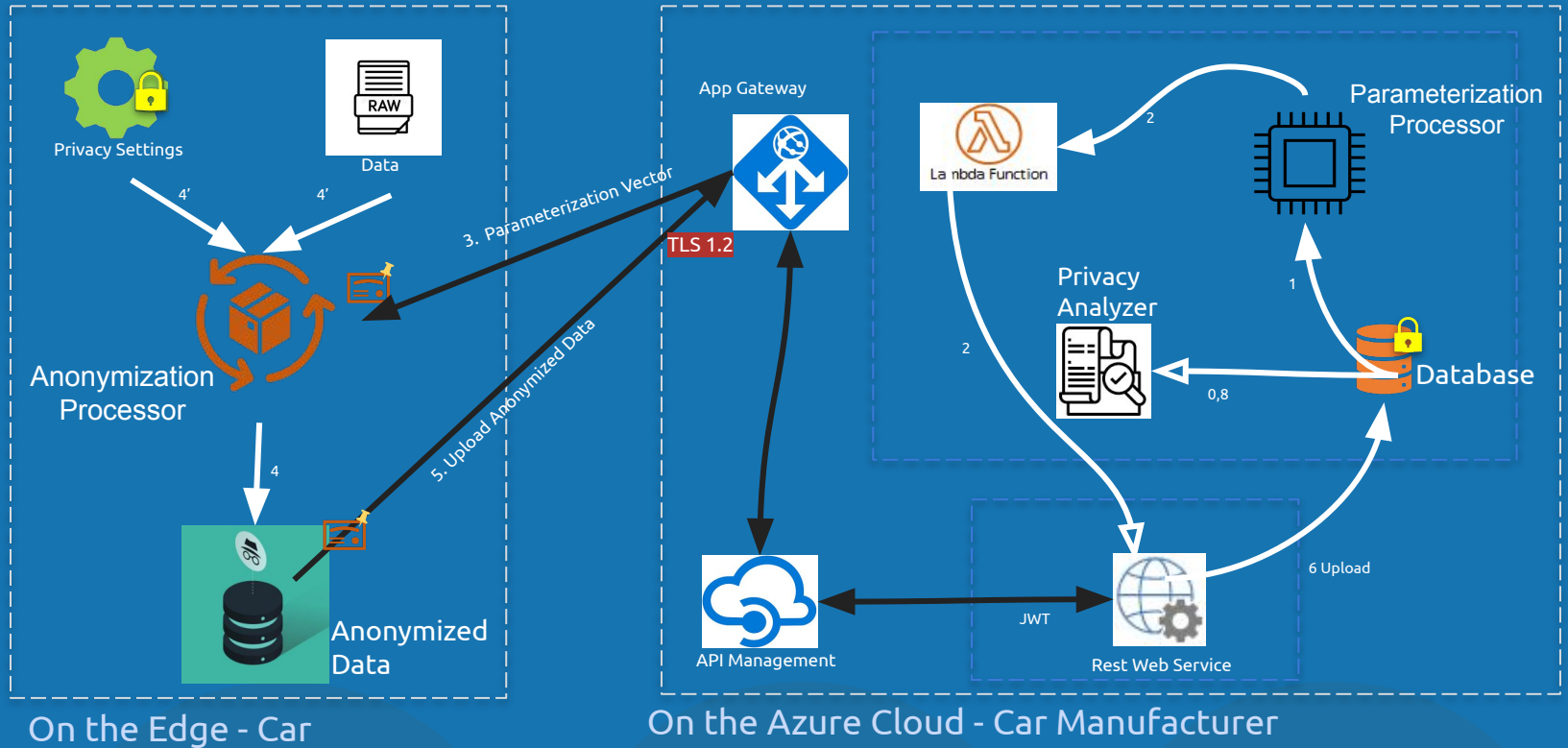
A. Anonymization of BOTH Location Data and Driving Behavior Data

B. Anonymization of ONLY Location Data

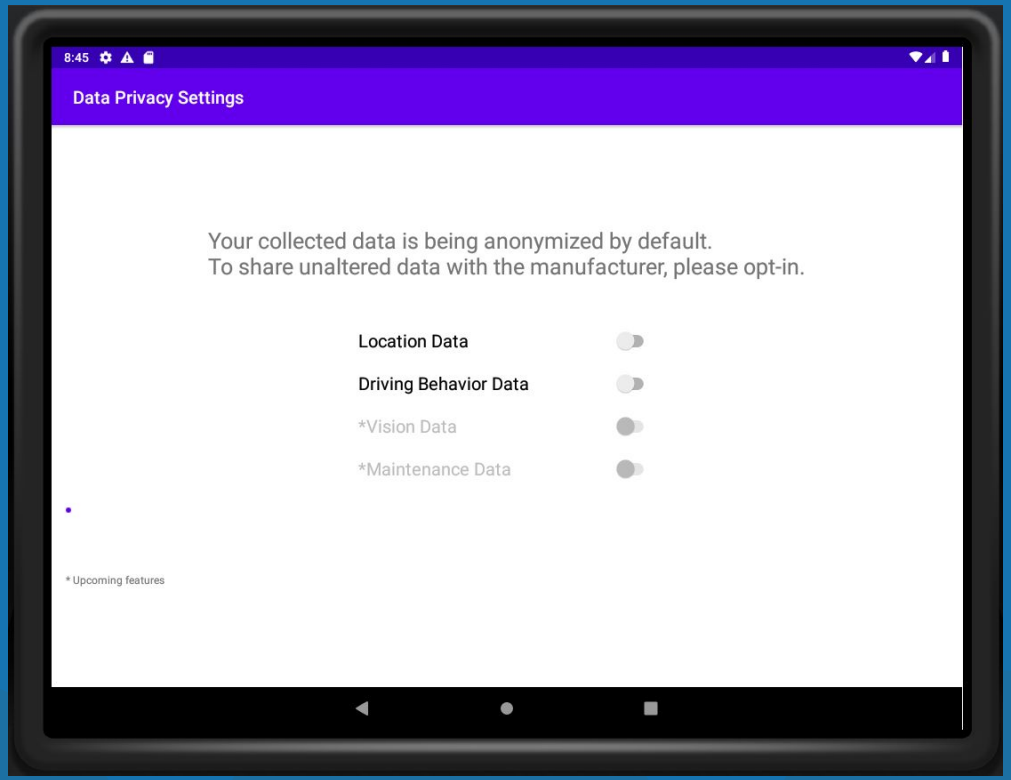
Demo A: Anonymization of BOTH Location Data and Driving Behavior Data

Demo B: Anonymization of ONLY Location Data

5-Anon in Execution



5-Anon in Execution



Advantages

Protection from Data Compromise

- Data Breach
- GM Hack
- Big Tech
- Data Brokerage

Compliance

- Federal Legislation
- Scalable Data Points
- Non-constrained by GDPR

Minimized Cost

- Seamless Integration
- Net Positive Benefit

Looking Forward

- Anonymization of Vision Data and phone synced data [Challenge, not forward benefit]
- Increased testing and validation for continued success with more vehicles
- Enhance anonymization algorithms
- Implement ML techniques for Parameterization processing
- Apply 5-Anon to:
  - Critical Mission Use Cases - Government Fleets (in progress)
  - Integrate it into Ridesharing Services & Rental Companies

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