Remote Vehicle Interaction

Project overview

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RVI Main Features

- Transport
- Control
- Big Data
- SOTA
Transport

**Connectivity**
- Utilize a wide array of data links to setup communication to and from vehicle, either P2P or via backend serve
- Provide encryption for secrecy, non repudiation, replay attack protection, etc
- Work with OMA, IEEE, and other organizations to standardize RVI and integrate existing communication standards

**Authentication**
- Prove the identity of communicating parties
- Use best-of-breed open source technologies to drive peer-reviewed security

**Authorization**
- Prove to remote parties the right to discover and invoke their services.

**Service Discovery**
- Announce services available to remote parties

**Service Invocation**
- Invoke services and report the result over unreliable data links that may change during execution
- Support retry and store & forward of service invocations to alleviate transient connectivity
RVI Control

Vehicle Integration
• Utilize Networking EG components to integrate with vehicle bus
  • Use W3C-based signal standards to control vehicle

Service Protocol
• Define vehicle control protocols between vehicle and remote entities

Web Services
• Use W3C-based standards to define web services for remote vehicle control
Data collection

- Integrate with Genivi components to harvest data
- Use dynamically OTA-loadable code to securely collect and pre-process data

Reporting

- Specify and implement in-vehicle reporting services and their protocols

Data gathering

- Server-side data reception, storage, and web service access
- Work with big data industry actors to integrate analytics and data feeds into a larger ecosystem
Implement and standardize SOTA Client

- Integrate SOTA Client with System Infrastructure and its Software Management activities
- Implement existing transport protocol standards in addition to Transport

Implement and standardize SOTA Server

- Specify and implement reporting services and their protocols

Integrate with industry

- Work with vendors and community to drive RVI SOTA adoption in the automotive industry
Scope

- **Transport protocol**

- **Security**
  - Authentication, Authorization, Encryption, Integrity, Non-repudiation, Denial of service.

- **Provisioning**
  - Key, token, and certificate management, device provisioning and revocation. Backend provisioning API.

- **Sensor data reporting**
  - On-board processing of sensor data. Transmission. Backend data access API.

- **OTA updates**
  - Package management, queueing, transmission, validation, and reporting. Backend software management API.

- **Remote Control**
  - Remote interface to vehicle systems. Backend control API.
OpenSSL
TLS provides core eavesdropping and MITM attack protection

RVI Credentials
Signed by root server to prove device authenticity and its right to invoke unlock on the given vehicle

Unlock
Will only be accepted by vehicle if validated certificate specifies device's right to invoke unlock command
Robustness

- **Multi-pathed commands**
  Commands can be tried over multiple data links, both as peer-to-peer and via backend server.

- **Traffic prioritization**
  Forces high-bandwidth services to use WiFi while allowing mission-critical services to use 3G and SMS.

- **Multi-protocol**
  A single service (such as unlock) can employ different protocols and data links depending on the targeted vehicle type.