Project Plan
VW Car-Net Smart Hub Web Apps
The Capstone Experience
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Functional Specifications

• Web app for use in VW cars’ head units
• Create, edit, and view boundaries
• Detect when the car has crossed over a geo-fence surrounding the driver’s house
• Trigger the automatic opening/closing of the garage door
• Use a similar approach to trigger events on other smart home devices
Design Specifications

• Web App displayed on infotainment unit along other Volkswagen applications

• Allows creation of Geo-Fences which, when crossed, can act as triggers for various devices

• Allows users to connect their smart home devices
  ▪ This project officially focuses on connection with Chamberlain Garage door openers, but could be applied to other smart devices in the future
Screen Mockup: Landing Page

VW Smart-Hub App
Screen Mockup: My Devices

My Devices

- My Garage Door
- My Other Garage Door

Add New Device
Screen Mockup: Edit Device

- Name
- What type of device is this?
- Device ID

Connect Geo-Fence
Screen Mockup: Edit Device (Textbox)
Screen Mockup: Edit Device (Dropdown)
Screen Mockup: Connect Device

Team VW’s Home

Add New Geo-Fence

Add New Geo-Fence
Screen Mockup: New Geo-Fence
Screen Mockup: Landing Page

VW Smart-Hub App
Screen Mockup: My Geo-Fences

My Geo-Fences

Team VW’s Home

Add New Geo-Fence

Add New Geo-Fence
Screen Mockup: New Geo-Fence

Add New Geo-Fence

Name of Geo-Fence

Please enter the address.
Screen Mockup: Edit Geo-Fence
Technical Specifications

• Written using Visual Studio Code
• Angular Web App
  ▪ TypeScript
  ▪ HTML5
  ▪ CSS3
  ▪ Webpack for task running/minifying code
• Interacting with:
  ▪ Google Maps API
  ▪ Chamberlain API
System Architecture
System Components

- **Hardware Platforms**
  - Will be downloaded from SIM card in VW vehicle, displayed on head unit
  - Automated connecting to Chamberlain garage door opener

- **Software Platforms / Technologies**
  - Google Maps API used to provide interactive map
  - Chamberlain API used for connecting to opener for automated opening/closing functionality
  - Angular app will eventually be run on a version of Chromium customized by the VW team
  - Development/testing using Chrome Browser
Risks

- Garage door behavior when inside geo-fence
  - Stop garage door from repeatedly opening and closing when near/inside boundary but not driving or GPS could be inaccurate
  - Add flags to detect car’s status (on/off, under a certain speed, etc) and modify open/close detection algorithm appropriately. Limit the number of times the garage door can open/close within a given time.
- Accuracy of mocked data
  - We have to mock all of the geolocation data, and don’t know how accurate that might be
  - Request access to coordinates from a test drive or generate simulated coordinates ourselves
- Testing Devices
  - We are missing devices that would be helpful for testing (garage door/opener, test bench)
  - Ask around to find someone with access to a garage door
- Boundary alert compatibility
  - We have to create a mocked boundary alert model that is compatible with the existing model used for Car-Net boundary alerts
  - Discuss with client about data model and request that they validate the one we produce
Questions?