Project Plan
Greenfields Labs SHARED Locker System
The Capstone Experience
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Spring 2019
Functional Specifications

• Cross platform app Android/iOS/Web
• Check-in/check-out locker items
• RGB led status indicator
• Automated locker unlock
• Showcase items in locker
• Support for multiple lockers
• Admin metrics
Design Specifications

- Cross-platform
- Event-driven
- Containerized
- Restful Microservice Driven
Screen Mockup: Mobile App
Screen Mockup: Web Locker Management

<table>
<thead>
<tr>
<th>Item</th>
<th>Locker #</th>
<th>Reserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualcomm Dragonboard 410c</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Qualcomm Dragonboard 410c</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Apple iPad Pro 11&quot;</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Cisco 819 4G LTE 2.0 Router</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Google Home</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Apple MacBook Pro</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
Screen Mockup: Web User Interface

Welcome back, Test_user!

- **Asset Management**
  - Qualcomm Dragonboard 410c
  - Locker # 9
  - Reserved till 9pm

- **Reservation**
  - Apple MacBook Pro
  - Locker # 15
  - Reserved till 5pm

- **Profile**
  - HTC VIVE Pro
  - Locker # 16
  - Reserved till 5pm

- **About**
Screen Mockup: Web Reservations

Welcome back, Test_user!

last login time: 2019-01-25 20:09

Asset Management
Reservation
Profile
About
Technical Specifications

- AWS Kinesis used as Event Stream to facilitate publisher / subscriber model
- Raspberry Pi used as hub between lockers and Event Stream
- Microservices built in Flask and containerized in Docker
- Mobile and Web clients use React.js Framework
System Architecture

Event Stream (AWS Kinesis) → Reservation DB (AWS RDS) → SnipeIT 3rd Party Asset Management → SnipeIT DB (AWS RDS)

Microservices:
- Notification Service
- Reservation Service
- Asset Service
- Authentication Service
- Metrics Service

Devices:
- Raspberry Pi
- Locker

Platforms:
- Mobile
- Web
System Components

• Hardware Platforms
  ▪ Raspberry Pi
    o 12V electronically actuated lock
    o Arduino microcontroller

• Software Platforms / Technologies
  ▪ React/React Native
  ▪ Flask, Docker
  ▪ AWS Kinesis
  ▪ AWS RDS
Risks

Hardware
- Risk Priority: High (High probability, High impact)
- Mitigation: Working to find students with backgrounds in electrical and computer engineering.

Cross-platform Development
- Risk Priority: Medium (medium probability, medium impact)
- Mitigation: Using React and React Native for cross-platform development.

Data Loss
- Risk Priority: High (medium probability, high impact)
- Mitigation: Using Git for versioning control

Physical Damage
- Risk Priority: Low (medium probability, low impact)
- Mitigation: We have duplicates of most of the hardware and it is inexpensive and easy to order if the need arises.
Questions?