

Start Date – End Date:

October 23 - November 5

Group number:

sddec18-17

Project title:

IoT Remote Monitoring for Commercial Appliances

Clients:

Taylor Greiner
Connor Jennings

Advisor:

Goce Trajcevski

Weekly Summary

The goal of our fifth reporting period was to finish implementation and integration of or prototype with an intended completion date of November 1, 2018. The prototype includes a completed android mobile application, a completed iOS mobile mobile application, a backend deployed to Amazon Web Services (AWS), and a washing machine with locking capabilities provided by a raspberry pi. The mobile team completed implementation of the administrator user interface screens for both android and iOS. The mobile team also completed all remaining APIs for sending and receiving information to/from the Spring Boot server. The backend team integrated the Stripe Payment SDK with the mobile team. Both iOS and Android are able to submit a secure payment transaction token from the client via secure SSL encryption to the Spring Boot Server. The Spring Boot server utilizes the stripe payment token to create a Stripe payment Charge. The charge successfully bills the customer and a payment receipt is published to the Stripe developer dashboard for confirmation. The backend team integrated MQTT connections with the hardware team to read information from the hardware attached to the washing machine. The backend team then deployed the updated Spring Boot server to AWS for live publication. Images displaying the results of several reservation tests can be seen below.

AMOUNT	DESCRIPTION	CUSTOMER	DATE
\$10.00 USD	Succeeded ✓ ch_1DTI8TIVsLwYJbKECxC5VCm0		2018/11/05 18:09:37 ...
\$2.00 USD	Succeeded ✓ ch_1DTI6qIVsLwYJbKEIP8xewDy		2018/11/05 18:07:56 ...
\$2.00 USD	Succeeded ✓ ch_1DTI6olVsLwYJbKEqc1k5JuJ		2018/11/05 18:07:54 ...
\$2.00 USD	Succeeded ✓ ch_1DRui4IVsLwYJbKEMAA17FUE		2018/11/01 23:56:40 ...
\$2.00 USD	Succeeded ✓ ch_1DRqopIVsLwYJbKEW6GYPB7f		2018/11/01 19:47:23 ...
\$10.00 USD	Succeeded ✓ ch_1DRpYxlVsLwYJbKE8Is4Kak4		2018/11/01 18:26:55 ...
\$10.00 USD	Succeeded ✓ ch_1DRpUkIVsLwYJbKEEnfmetqk0		2018/11/01 18:22:34 ...
\$10.00 USD	Succeeded ✓ ch_1DRpGblVsLwYJbKE6PvTOqsU		2018/11/01 18:07:57 ...
\$10.00 USD	Succeeded ✓ ch_1DRp3PIVsLwYJbKEgH1XPKTr		2018/11/01 17:54:19 ...
\$1.00 USD	Succeeded ✓ ch_1DRozfIVsLwYJbKETt6DdSGe		2018/11/01 17:50:27 ...

[Image of all the test transactions generated utilizing the android and iOS mobile application and the Spring Boot backend]

\$10.00 USD
TEST DATA
PAYMENT

↶ Refund... + Add note

✓ Payment succeeded
Nov 5, 6:09 PM

28 Stripe risk evaluation: normal
Nov 5, 6:09 PM

Payment details

ID	ch_1DTI8TIVsLwYJbKECxC5VCm0
Amount	\$10.00
Fee	\$0.59
Net	\$9.41
Date	2018/11/05 18:09:37
Description	No description Edit

Metadata [Edit](#)

No metadata

Card

ID	card_1DTI8SIVsLwYJbKEPO3wzG1q	Billing address	Not provided
Name	No name provided	Origin	United States
Number	•••• 4242	CVC check	Passed ✓
Fingerprint	uTexXq2qLxedzGWR		
Expires	10 / 2020		

[Image of the transaction receipt]

Past week accomplishments

Team Member 1 - Name

John Fleiner

Team Member 1 - Role

Android Development Lead

Team Member 1 Contribution

Android APIs

- Implemented Card Exist API for Login to determine if a user has a card stored on file. If not, then the user is prompted to enter credit card information prior s
- Updated AddCardAPI to update the user singleton model with updated credit card information for checkout purposes
- Updated RetrieveCardAPI to update the user singleton model with credit card information for checkout purposes
- Updated CardExistsAPI to update the user singleton model with credit card information for checkout purposes
- Implemented ApplianceAvailableAPI to return the number of available washing machines and drivers for the given location.
- Updated LoginAPI to determine if the user logging in is an admin or a customer. If the user is an admin, then they will be taken to the admin homepage.
- Updated ReservationAPI to submit a stripe token and reservation price
- Implemented PriceAPI to calculate the price of the reservation according to the user input
- Updated Future and Historical ReservationAPI to handle backend updates for price

Android Models

- Updated user singleton model to store credit card information for ease of checkout

Android Stripe SDK

- Implemented Tokenization to create token containing payment information to be processed by the server
- Integrated with Backend to receive payment token and submit a charge via stripe

Android UI

- Implemented Custom AlertDialog for invalid reservation: displays error message letting the user know that the form they have entered is incorrect.
- Implemented Custom AlertDialog for successful reservation: Displays success message letting the user know that their reservation was successful.
- Implemented Custom AlertDialog for invalid card: displays an error message letting the user know that their card has been declined
- Implemented TextWatchers for all input fields in order to call the PriceAPI as the user changes the text input

Team Member 1 - Hours Worked

33

Team Member 2 - Name

Ben Young

Team Member 2 - Role

iOS Development Lead

Team Member 2 Contribution

iOS APIs

- Implemented the price api to update the price of the current amount of washer and dryers for the amount of time they selected
- Implemented the reservation api to a user to make a reservation on a given day, at a given time, and for a given amount of washers and dryers
- Implemented the appliance api to check the amount of machines that are available at the location the user select so they can't make a reservation when there aren't enough machines
- Implemented the retrieve credit card api to get the credit card of the user from the backend to make the payments with stripe
- Implemented the updates to the history and current reservation api to include price
- Updated the login api to handle if the user is an admin or not and show the user side or admin side base on the result

iOS Model

- Updated the Current User Model to store the user's credit card information that is retrieve from the server

iOS Stripe

- Finished the implementation of the stripe sdk to send a payment to the backend to be confirmed

iOS UI

- Finished the rest of the UI required for the project

Team Member 2 - Hours Worked

35

Team Member 3 - Name

Thomas Stackhouse

Team Member 3 - Role

AWS & Spring Boot Backend Lead

Team Member 3 Contribution

- Integrated MQTT connections to read from hardware
 - Reads and writes, talks with each machine on separate queue
- Troubleshooting database schema issues
 - Schema changes were not applied correctly to the remote database
- Deploying updated server to AWS
- Working with team to set up the demo to our clients

Team Member 3 - Hours Worked

19

Team Member 4- Name

Hongyi Bian

Team Member 4 - Role

Hardware Engineering Lead

Team Member 4 Contribution

- Integration with the backend team for final prototype demo
 - Implementation of the scripts on Raspberry Pi
 - Clock interruption problem implementation
 - MQTT queue connection implementation based on previous works
 - Real-time messaging control
- Fix undesired user interface issues
 - Verifying stage unprotected interval fixing
 - Code re-enter problem fixed
 - Sticky keypad entering issue fixing
 - Screen display error
- Implementation for an easier networking setup
 - Recall the IP address e-mailing method
- Hardware reliability testing
 - Usability testing

Team Member 4 - Hours Worked

18

Team Member 5 - Name

Yuanbo Zheng

Team Member 5 - Role

Hardware Engineer

Team Member 5 Contribution

- Continue the testing on our hardware components :
 - To do usability testing.
- Work with our hardware leader to integrate with backend team prepare for the demo on next Thursday :
 - Implementation on MQTT queue connection.
 - Implement the python scripts on our Raspberry Pi.
- Continue finding a best way which is **waterproof** and **theftproof** to combine all hardware components :
 - Integrate entire prototype, search for a designed box which can attach on the portable washing machine. Store hardware components into it.
- Research on MQTT callback interruption implementation.

Team Member 5 - Hours Worked

16

Team Member 6 - Name

Casey Gehling

Team Member 6 - Role

Spring Boot Backend Developer

Team Member 6 Contribution

- Integrated Stripe payment platform with the spring boot server
 - Updated reservation API to call stripe
- Implemented reservation price API for the front end
 - Updated database accordingly
- Updated database schema and signup API to include admin flag
- Cleaned up remote database data
- Updated available appliance endpoint for the front end

Team Member 6 - Hours Worked

20

Individual contributions

Team Member	Contribution (Quick list of contributions. This should be short).	Hours this reporting period	HOURS cumulative (this semester)
John Fleiner	<ul style="list-style-type: none">• Finished implementing the Android APIs• Finished the Android UI• Implemented Stripe Payments	33	103
Ben Young	<ul style="list-style-type: none">• Finished implementing the iOS APIs• Finished laying out the UI• Implemented stripe payments	35	92
Thomas Stackhouse	<ul style="list-style-type: none">• Integrated MQTT connections to read from hardware• Troubleshooting database schema issues	19	61
Hongyi Bian	<ul style="list-style-type: none">• Integration with the backend team for final prototype demo• Fix undesired user interface issues• Implementation for an easier networking setup• Hardware reliability testing	18	68

Yuanbo Zheng	<ul style="list-style-type: none"> ● Continue the testing on our hardware components ● Work with our hardware leader to integrate with backend team prepare for the demo on next Thursday ● Continue finding a best way which is waterproof and theftproof to combine all hardware components ● Research on MQTT callback interruption implementation 	16	66
Casey Gehling	<ul style="list-style-type: none"> ● Implemented Stripe w/ backend ● Added/Updated the API for the front end ● Cleaned up database 	20	73

Pending issues

We set a goal for having a completed prototype by November 1, 2018. The prototype includes a completed android mobile application, a completed iOS mobile mobile application, a backend deployed to Amazing Web Services (AWS), and a washing machine with locking capabilities provided by a raspberry pi. On November 1, our backend team deployed the Spring Boot Server to AWS. The deployment of the server crashed both mobile applications due inconsistencies between the local DB and the remote DB. The inconsistencies included improper column types for each db table which caused all of our APIs to fail. The database needs to be refactored to meet the requirements used from the remote DB. Once the database has been refactored, all APIs will work once again.

Plans for the upcoming weeks

Team Member 1 - Name

John Fleiner

Team Member 1 - Role

Android Development Lead

Team Member 1 Plans

- Perform functional and integration testing
- Perform usability testing
- Prepare for live demonstration on Thursday, November 8th
- Perform bug fixes and API failures
- Refactor remaining code for production use
- Prepare Final Report

Team Member 2 - Name

Ben Young

Team Member 2 - Role

iOS Development Lead

Team Member 2 Plans

- Do some functional and integration testing before the final demo on thursday with the client
- Fix any issues that are run across as I am doing my testing

Team Member 3 - Name

Thomas Stackhouse

Team Member 3 - Role

AWS & Spring Boot Backend Lead

Team Member 3 Plans

- Work on fixing the remote schema issues
- Upload any changes to AWS
- Work on identifying more portions of our project that need to be explicitly defined in our final report

Team Member 4 - Name

Casey Gehling

Team Member 4 - Role

Spring Boot Backend Developer

Team Member 4 Plans

- Continue testing on the backend
- Makes updates at the request of the front end team
- Continue working on the final report

Team Member 5 - Name

Yuanbo Zheng

Team Member 5 - Role

Hardware Engineer

Team Member 5 Plans

- Help with hardware lead to finish the implementation of hardware side
- Check if all components work well for the Thursday's demo for our client
- Work on our final report

Team Member 6 - Name

Hongyi Bian

Team Member 6 - Role

Hardware Engineering Lead

Team Member 6 Plans

- Finish the implementation of hardware portion
- Testing the prototype
- Working on the documents

Summary of Bi-Weekly Advisor Meeting

The goal of our fifth Bi-Weekly status meeting with Goce Trajcevski was to provide a demonstration of our prototype and discuss plans for our poster design and final report. The demonstration including execution of the payment transaction platform and the locking/unlocking of a washing machine. Our team was then given feedback regarding proper poster design for font-size, formatting, layout, and image quality. Prior poster design issues included the use of paragraph format rather than bullet point format, small font-sizes which leads to readability problems, and poor image quality that takes away from user interface designs and analytics. The third item discussed during the advisor meeting was the final report. As mentioned in the previous status report, due to ABET requirements changes, our team must include an up-to-date testing and security section with details about unit testing, integration testing, verification, validation, and security.