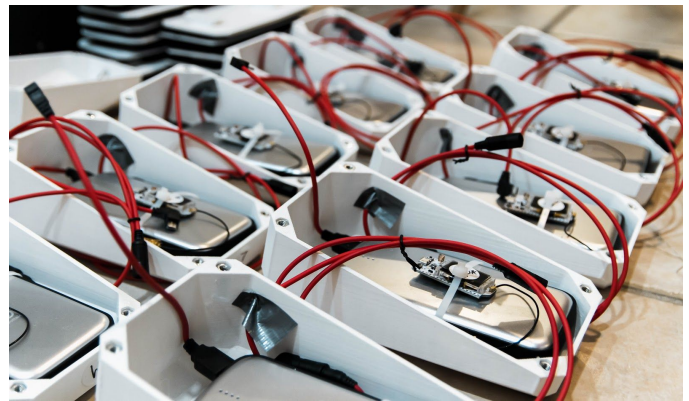# ((•,•)) Project OWL

Field Test 2 Puerto Rico | Report

OCTOBER 2ND - 9TH, 2019

The second field deployment in Puerto Rico of Project OWL focused on a return to the island. This report details strategy, conclusions, and outlook forward as a result of the event.

Field Test 2 Puerto Rico | Report
Overview

The objective of Puerto Rico 2 was to deploy permanent, solar-powered DuckLink devices. These devices are more reliable, longer-lasting, and include sensors that are streaming data to the internet 24/7. Additionally, Project OWL focused on further improving 1) efficiency of deployment and 2) network performance to minimize transmission errors.

The results of this deployment were positive. Despite more sophisticated hardware and brackets, the DuckLink devices can be deployed and online in around a minute each. At the same time, the network operated with more consistent connectivity and fewer network transmission errors at nearly 95% network uptime. Additionally, over 40 new individuals were added to the open-source slack channel bringing the total contributors to over 230 across 6 continents.

This report details Field Test 2: Puerto Rico in sections:

Puerto Rico: Mayagüez Region

Mayagüez

Rooftops at UPRM where Project OWL deployed the DuckLink devices

University of Puerto Rico, Mayaguez was chosen as the primary deployment location for several reasons. First, In 2017 Mayaguez suffered deeply from Hurricane Maria losing network connectivity and electricity. It is a technical school with many students interested to collaborate on open source technology. Project OWL deployed alongside 20 students lead by the Dean of Engineering as well as other administrators at the college. Altogether this rendered UPRM a great location to place 17 permanent, solar-powered DuckLink devices.

Each device provides the network backbone for emergency communications should electrical grids and cellular go down. Additionally, this DuckLink network provides an outlet for new sensor devices students may design to build other projects on top of Project OWL technology.

Puerto Rico: Three Regions

Isabela | San Juan | Bayamon

Isabela location, October 8th

Isabela location rooftop, October 8th

Three additional locations saw deployments during Puerto Rico II. These locations included a return to Isabela, San Juan, and Bayamon. The deployment in Isabela was on the roof of a local business. In San Juan, Project OWL deployed several DuckLinks on the rooftops of Polytechnic University of Puerto Rico. In Bayamon, two devices were deployed at the familiar location of Engine-4, a technological co-working space for innovators in Puerto Rico.

These additional locations will serve as a foundation upon which more devices will be later deployed. These additional deployments will expand the network to make it more resilient and capable in the future.

Total Deployed DuckLinks

25 DuckLinks

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A DuckLink sits in the wild at Polytechnic UPR

Primary Deployment Location

17 DuckLink devices deployed in the Mayaguez region of Puerto Rico. These DuckLinks were placed throughout the University of Puerto Rico, Mayaguez campus and in addition to an emergency network backbone are streaming weather data 24 hours a day, 7 days a week. The Ducks were deployed by the Project OWL team as well as professors, administrators, and a group of 10-20 students over several days. The size of the campus is just under one square mile of coverage.

Secondary Deployment Locations

An additional 8 DuckLinks were deployed in Isabela (2), Polytechnic University of Puerto Rico (4), and Engine-4 in Bayamon (2). These Ducks are the foundation for later expansion deployments and also will stream weather data to the OWL cloud software.

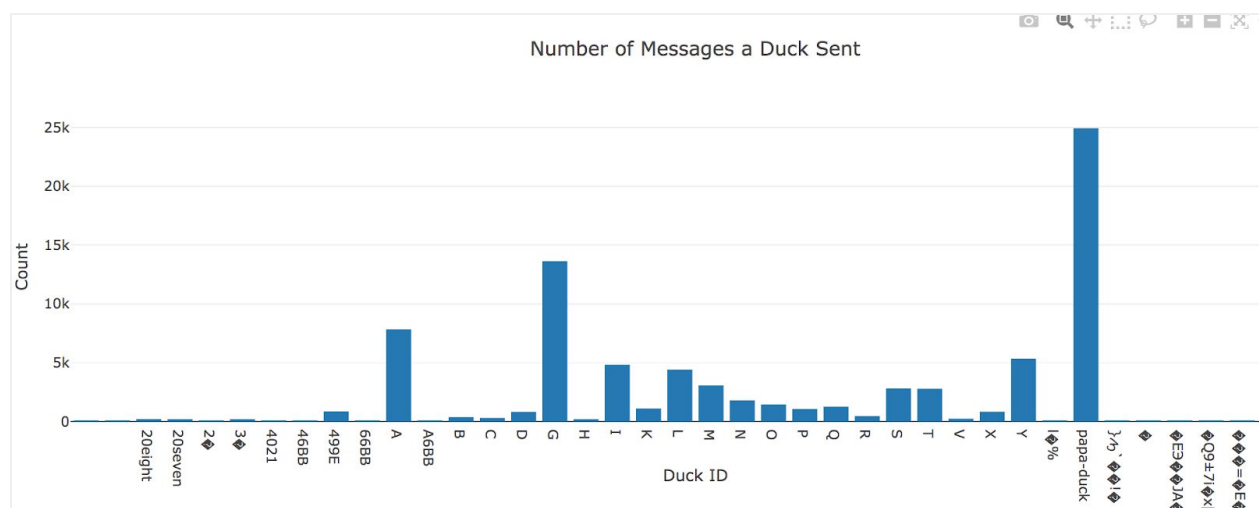Field Test 2: Puerto Rico was the most significant deployment of Project OWL hardware and software technology to date. This deployment included a new permanent version of the DuckLink devices and for the first time deployed powered by the sun. The software platform was re-architected to scale more efficiently, is built on a more robust backend, and now includes a basic API to extract data from the OWL Data Management Software.

Deployment efficiency continued to improve. While these devices are the most sophisticated to date, Project OWL developed a simple, modular device platform for easy install and removal. Each duck took around two minutes from powered off to installed and online. Once online, the database was monitored for network activity. These DuckLinks are streaming weather data every five minutes, including temperature, pressure, altitude, and air quality data.

In total, over 40,000 entries were added to the database in just under a week. This number continues to grow to this day as the Ducks are streaming data all day, every day. This data will be forwarded to other entities such as UPRM and The Weather Company (owned by IBM).

Distribution of network transmission separated by DuckLink variant

Challenges & Moving Forward 🚀

Field Test III Puerto Rico was a success. In total, 25 DuckLink devices were deployed in 4 separate regions focused on UPR Mayaguez. These devices are stronger, longer-lasting, more resilient to problems, and are permanent and solar-powered.

The devices are also streaming weather data every day to help better understand weather patterns on a building by building basis - a new capability for the devices.

In total, an order of magnitude more data was acquired during the deployment and continues to accumulate to this day. In fact, each day more data is generated from this Duck deployment than in all previous deployments combined.

Project OWL continued to improve deployment efficiency and network performance. However, there still exists difficulty scaling devices to large networks. The team will be working hard to solve this, and plans a return to Puerto Rico later this year. We could not be more excited for the event, and passionately look towards the future.

Bryan Knouse, Co-Founder