Hybrid-Mobile App Release 2

Consumers Energy

Count on Us

Andrew Burch

Tyler Pease

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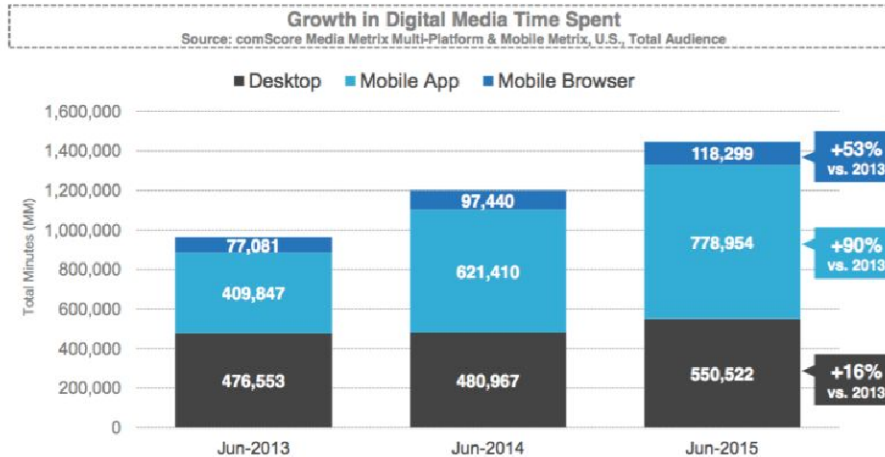
1.

History and Background

Company Background

- Michigan's largest energy provider
  - Electricity & Natural Gas
  - 6.6 million of Michigan's 10 million residents
  - Operates in all 68 lower peninsula counties
- Founded in 1886
- Headquarters in Jackson, MI

The Problem ❓

- ❏ Unoptimized company website
    - ❏ Especially for mobile users
- ❏ Absent mobile presence
- ❏ Poor awareness for streetlight outage reporting
- ❏ Minimal communication company ↔ customers

Growth in Digital Media Time Spent
Source: comScore Media Metrix Multi-Platform & Mobile Metrix, U.S., Total Audience

Legend: ■ Desktop   ■ Mobile App   ■ Mobile Browser

	Jun-2013	Jun-2014	Jun-2015	
Mobile Browser	77,081	97,440	118,299	+53% vs. 2013
Mobile App	409,847	621,410	778,954	+90% vs. 2013
Desktop	476,553	480,967	550,522	+16% vs. 2013

The Solution

- ❏ An efficient, user-friendly hybrid-mobile application
- ❏ Better customer ↔ company interaction
- ❏ Expectation for a mobile presence fulfilled
- ❏ Take services Consumer's already offers into mobile setting
  - ❏ Streetlight Outages
  - ❏ Alternative Energy Resources

Mobile Browser ❓

Hybrid ✅

Native App

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01010101010
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101110101010

⬆ ⬇

Device APIs

+

Browser

```
<html>

<head>
 <script>
 </script>
</head>
<body>
</body>

</html>
```

=

Container

```
<html>
...
</html>
```

⬆ ⬇

Device APIs

HTML 5 CSS 3 JS 5

HTML 5 CSS 3 JS 5
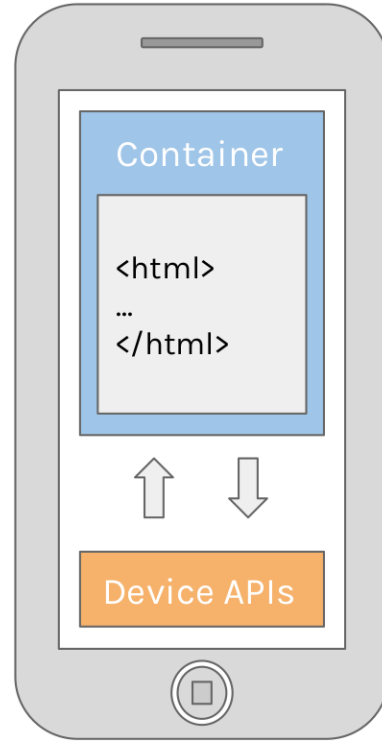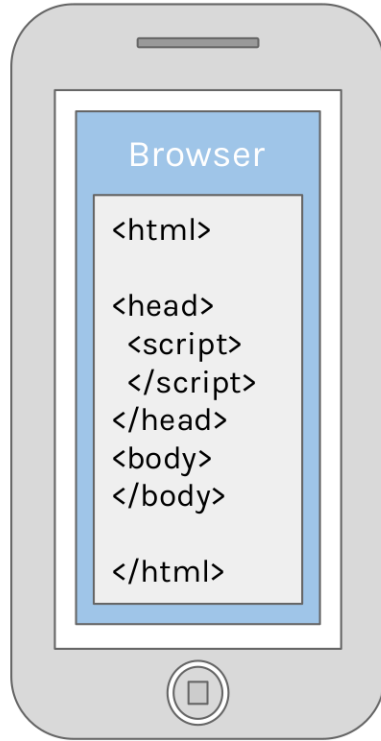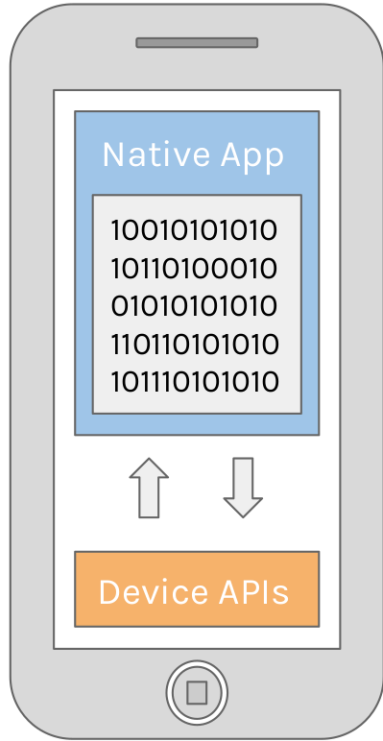
2.
Design Decisions
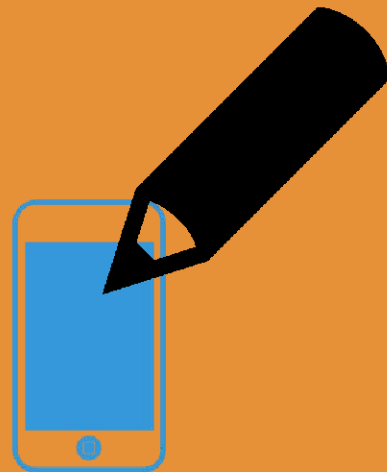
► And new features!

Design Decisions (Inherited)

❏ Hybrid vs. Native

❏ Ionic framework + AngularJS

❏ Flask / Python webserver

❏ RESTful API for communication

New Features: Additional Server

SFTP

Development

VPS #1

VPS #2

VPS #3

Testing
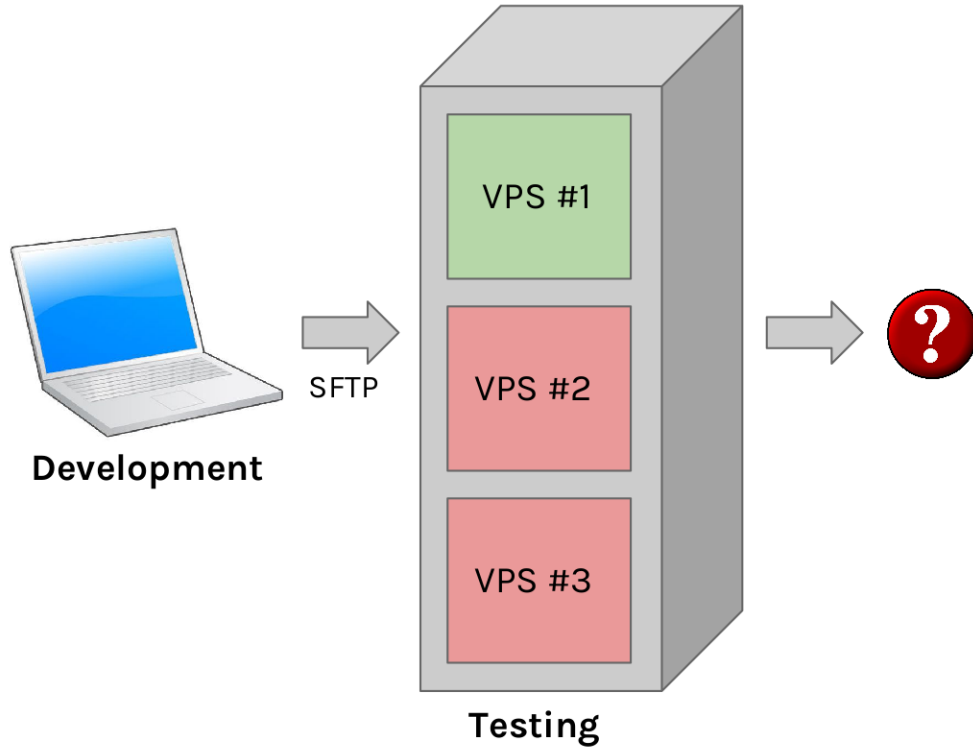
► What is missing?

New Features: Additional Server

	HostGator	Kimsufi	GoDaddy.com
Pricing	$103.23/mo	$28.00/mo	$169.99/mo
CPU	Xeon 4 Core 2.5 GHz	i5-3570s 3.1 GHz	Xeon E3-1220-v3
RAM	8 GB	16 GB	16 GB
Storage	2 TB	2 TB	4 TB
Support	✓	?	✓

New Features: Additional Server

Development

SFTP

VPS #1

VPS #2

VPS #3

Testing

DS #1

Production
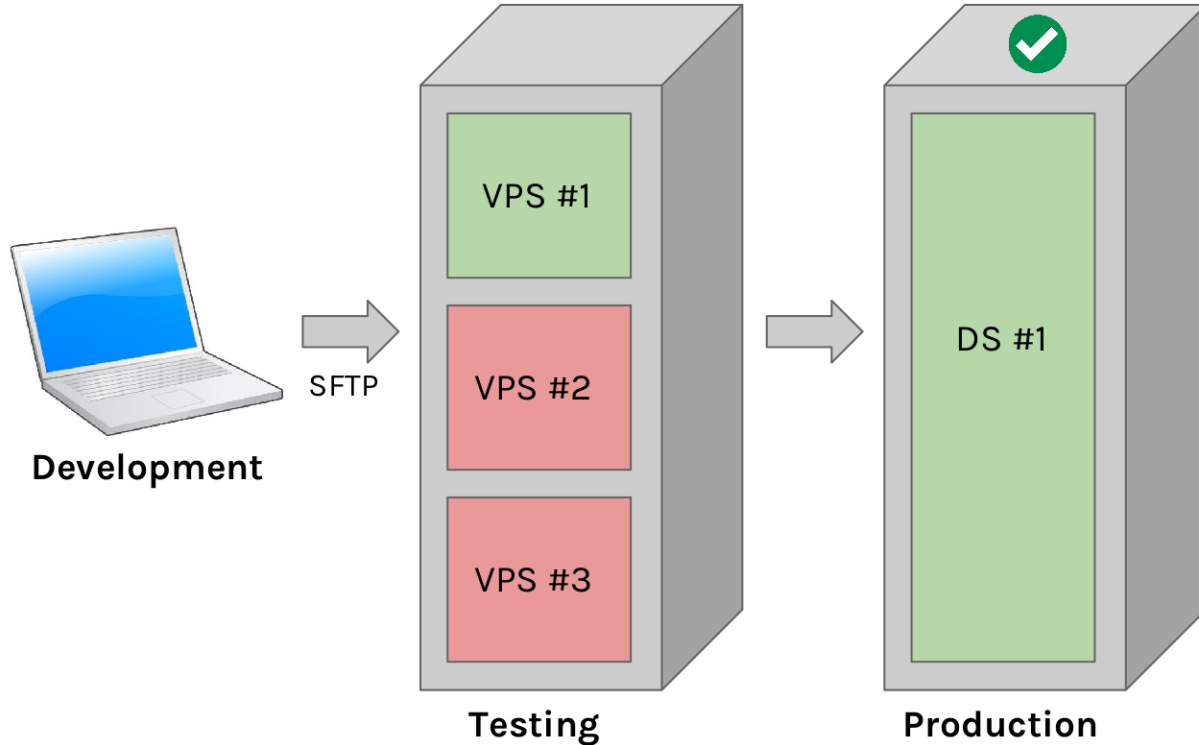
▶ More scalability!

New Features: Additional Server

► More scalability!

	DigitalOcean	Kimsufi
OS	Ubuntu 15.10	Ubuntu 15.10
CPU	Intel Xeon 6-core	i5-3570s 3.1 GHz
RAM	512 MB	16 GB
Storage	20 GB	2 TB
Support	✓	?
	Testing	**Production**

New Features

❏ UI Changes

    ❏ Request to rework pieces of the user interface

        ❏ Improve functional behavior / ease-of-use

❏ First-use Tutorial

    ❏ Request to add an initial tutorial upon installation

    ❏ Shows user how to use application

► Ease-of-use!

New Features

❏ Alternative Energy Posts ♻

❏ Push Notifications

    ❏ Better communication for the customers

    ❏ Power restoration notifications

❏ SQLite -> MySQL

❏ Android compatibility

► And more!

3.

Implementation and App Demo

Consumers Energy

Count on Us

1. Welcome! Thanks for trying out this new app!

2. The following information serves as a reference on how this application works, how to navigate this application, how to report outages, how to register, and so on.

　　›　Use the ☰ icon to view the side menu. All the other uses of this application are listed here.

　　⌂　Under the side menu, tap "Home" to view the home page and RSS feeds.

　　⇥　Under the side menu, tap 'Login' to log into the application with the user account you created with the 'Register" page.

　　⊙　Under the side menu, tap 'Register" to create your own user account. This account will be used to validate outage reporting.

　　♀　Under the side menu, tap "Power Outage Map" to report power outages.

Parkview Ave
Kalamazoo Michigan

< Parkview Ave

Parkview A

Campus Dr

Google
© 2015 Google | Terms of Use | Report a problem

GPS   Pin   Pin   Send

4.

Client and Server Technology

Client Software 📱

- ❏ AngularJS + Ionic framework

  - ❏ Tools for application creation, MVC structure

- ❏ Cordova

  - ❏ HTML / CSS / JavaScript "container"

Server Software

❏ Apache

  ❏ Plethora of documentation

❏ Flask / Python through Apache

❏ MySQL database containing outage reports

Communication
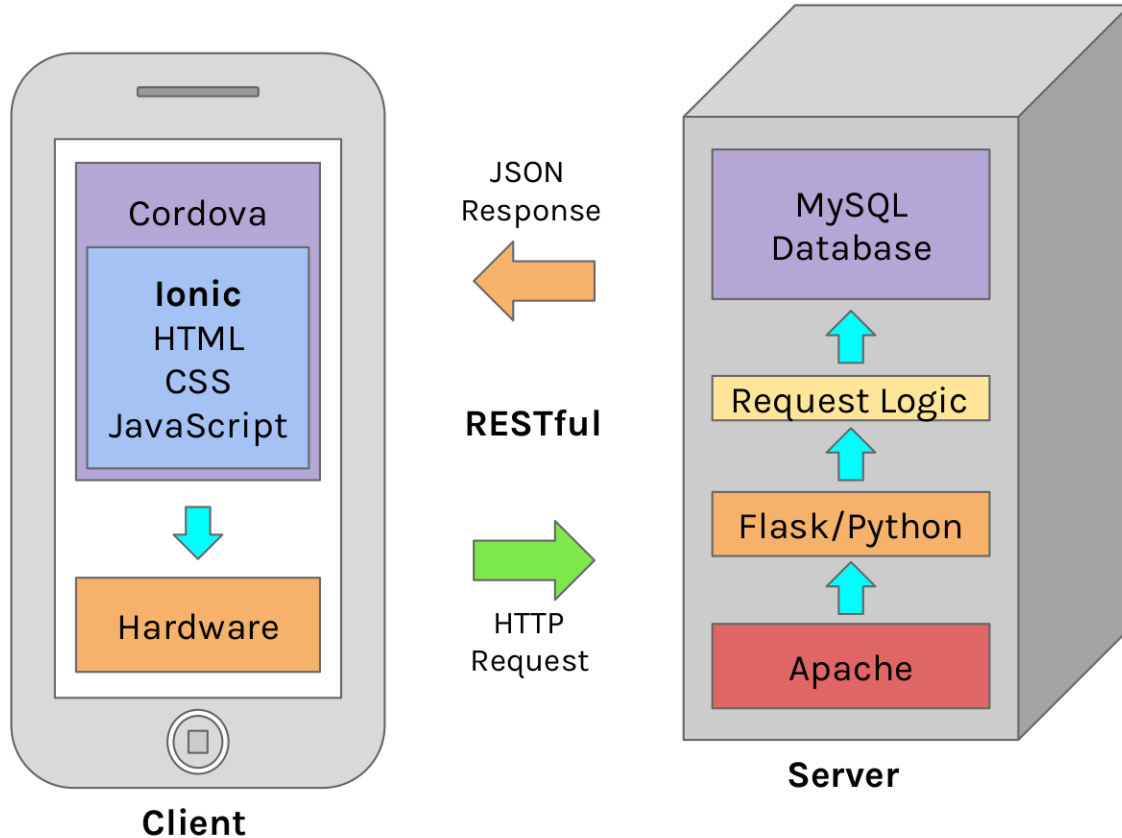
Client

Server

5.
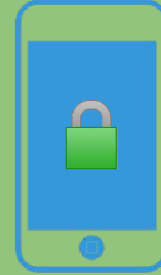
Security

Security

❏ HTTPS

    ❏ Encrypted connection between clients and server

🔒 https://

❏ SQLAlchemy

    ❏ Protection against SQL injection

SQLAlchemy

Security

🔓

❏ Flask-Security

   ❏ Token creation for each user account

❏ Firewall via IPTables

❏ SSH private keys

   ❏ Protection against brute-force attacks

6.

Testing

Testing: Client

- ❏ Unit testing via Karma framework

```
// Checking variable scopes and existence
describe("Unit_Testing", function() {
    var $scope, ctrl;
    beforeEach(function() {
        module('starter');
        module('starter.home');
    });
    beforeEach(function() {
        inject(function($rootScope, $controller) {
            $scope = $rootScope.$new();
            ctrl = $controller("HomeCtrl", { $scope: $scope });
        });
    });
    …
```

```
…
    // Checking homeImages
    it("check for $scope.homeImages variable", function() {
        expect($scope.homeImages).toBeDefined();
    });
    …
});
```

- ❏ Functional testing with varying hardware

    - ❏ Added support for iOS + Android platforms

- ❏ Usability testing with "Ionic View" app

Testing: Server

- ❏ Stress testing with ApacheBenchmark

```
$ ab -n 1000 -c 200

Concurrency Level:      200
Time taken for tests:   0.859 seconds
Complete requests:      1000
Failed requests:        0
Total transferred:      1814000 bytes
HTML transferred:       1372000 bytes
Requests per second:    1164.49 [#/sec] (mean)
Time per request:       171.749 [ms] (mean)
Time per request:       0.859 [ms] (mean, across all concurrent requests)
Transfer rate:          2062.88 [Kbytes/sec] received

Connection Times (ms)
              min     mean    [+/-sd]   median   max
Connect:      33      94      40.8      84       317
Processing:   3       66      20.2      67       155
Waiting:      1       27      14.1      24       110
Total:        49      161     46.4      154      422
```

- ❏ Security testing

  - ❏ Network mapping tools

- ❏ Python unit testing

7.

Maintenance

Why is it Important?

October
2011

September
2015

iPhone 4s
iOS 5.0

iPhone 6s
iOS 9.0

February
2011

October
2015

Android 2.3
Gingerbread

Android 6.0
Marshmallow

Maintenance

- ❏ Automatic updates to software and frameworks
    - ❏ Ionic (Client)
    - ❏ Flask (Server)
- ❏ Scalability via custom configurations
    - ❏ Apache VirtualEnv
- ❏ Maintenance document for future developers

8.

Summary

Summary

- ❏ Problem: Company website is currently unoptimized
    - ❏ Mobile browser with poor functionality
- ❏ Solution: Hybrid-Mobile Application
    - ❏ Efficient communication
    - ❏ Elegant & maintainable framework

Questions?