GardeNet

TEAM 16

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The Team

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The Project

The Problem
- Watering is a labor intensive venture
- Community gardens often have difficulties to get consistent volunteer help

Our Solution
- Automate the watering process via
  - 3G cellular network
  - Internet-of-Things (IoT)

Target Market
- Urban farms to community and home gardens
- Our main client is Caledonia Community Garden

Caledonia Community Garden
https://lintvwotv.files.wordpress.com/2014/06/maranda-caledonia-community-garden.jpg?w=650
Design Norms

- Integrity
- Trust
- Humility
- Stewardship


http://g4.img-dpreview.com/3840a420d7854a149394c67164f2a16.jpg
Our Design

Simplified GardeNet System Architecture
Website

- Platform: Apache web server on Raspberry Pi
- Features
  - Dynamic scheduling
  - Set weather sensitivity per zone
  - “Public” and password protected “Admin” views
  - View historical data
  - Modify alert and account settings

GardeNet Website
Server

- Platform: Python server on Raspberry Pi
- Communication: Internet sockets
- Controls
  - Communication between the website and the gateway
  - Historical data
- Monitors
  - Weather
  - Garden status, sends alerts

**GardeNet Server Architecture**
Gateway

- Platform: Arduino Leonardo / MEGA 2560
- Communication
  - 3G Modem
  - RF24 radio
- Controls
  - Nodes
  - Alerts
- Monitors
  - System feedback data

The Gateway
Node

- Platform: Arduino Nano
- Communication: RF24 radio
- Controls
  - 4 valves
  - 1 flow rate meter
- Monitors
  - Input voltage level
  - Flow states
  - Communication link
- Modular
  - Up to 16 nodes
  - All programmed with same code
Final Solution
Project Highlights

Challenges
- 7 programming languages
- Exosite vs. GardeNet server
- Reliability
- Budget and time constraints

Opportunities
- Advice from experts
- Learning curve

The Complete System
Assessment

**What We Learned**
- Systems design
- Web development
- Networking

**Future Work**
- Better onsite control
- Onsite weather monitoring
- Control lights, outlets
- Dedicated mobile app
- Support multiple customers

*The Complete System*
Thanks

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Questions