Site Locking and Alerting Mechanism for Doors (SLAM-Doors)

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Project Context

Client

General Dynamics Missions Systems (GDMS)

- U.S. defense contractor
- Tasked with developing secure mission-critical systems for military and government clients
  (Focus: U.S. Coast Guard)

Project Domain: Remote **Access Control** Systems

Core Need

Security, **Resiliency**, and **Reliability**

→ Replace **unreliable** commercial access control systems

Problem Statement

Currently reliant on **commercial** off-the-shelf (COTS) **access control systems**

Problems:

- Updates to the system are difficult
- High latency due to weather interference
- Potential physical break-ins

Downtime Compromises Mission Readiness

Solution Vision

Solution: A **secure** and **resilient** access control system designed for degraded **environments**.

1. Door controls making **local decisions**
2. Secure communication
3. Web-based admin portal

Impact:

- Maintains operation **during high latency** and **outages**
- Provides **real-time visibility** to administrators
- Increases mission readiness

Key Requirements Review

15 Client Requirements

Deconstructed into sub-requirements

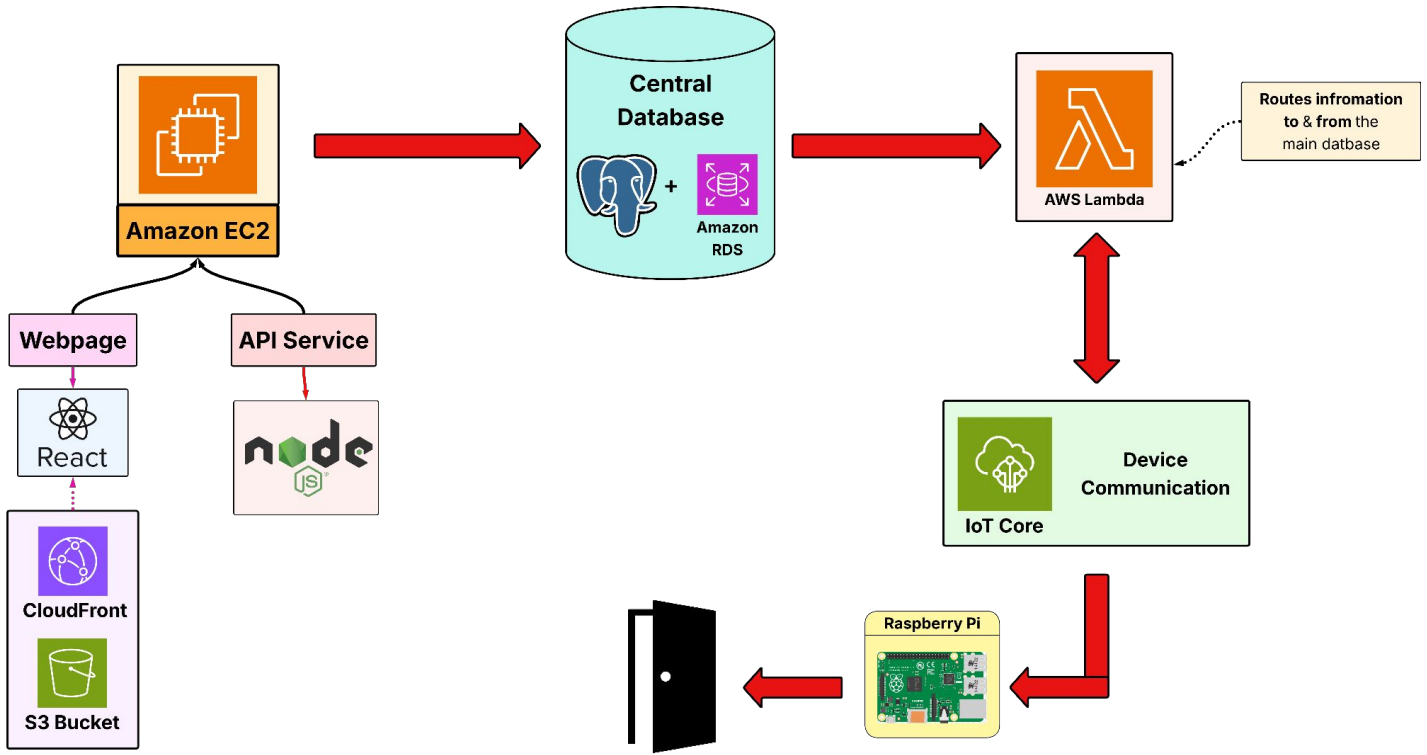
12 **Total Functional Requirements**

- **2** Performance Requirements
- **1** Environmental Requirement

Requirement Key Themes

1. Intrusion Detection & Alerts
2. Secure Access Control
3. High-Latency Reliability
4. Event Logging & Auditing

Architecture & Implementation



Frontend Hosting

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Testing Plan

Unit Testing

1. Back-end

a. Event handling
b. Authentication

2. AWS Lambda

a. Input & Output validation

3. Hardware

a. Intrusion Detection

Integration Testing

- Front-end (web client)
- Back-end *
- Database
- Raspberry Pi

* Discovered communication and compatibility issues

Usability Testing

Usage scenario:

✓ Log in & log out

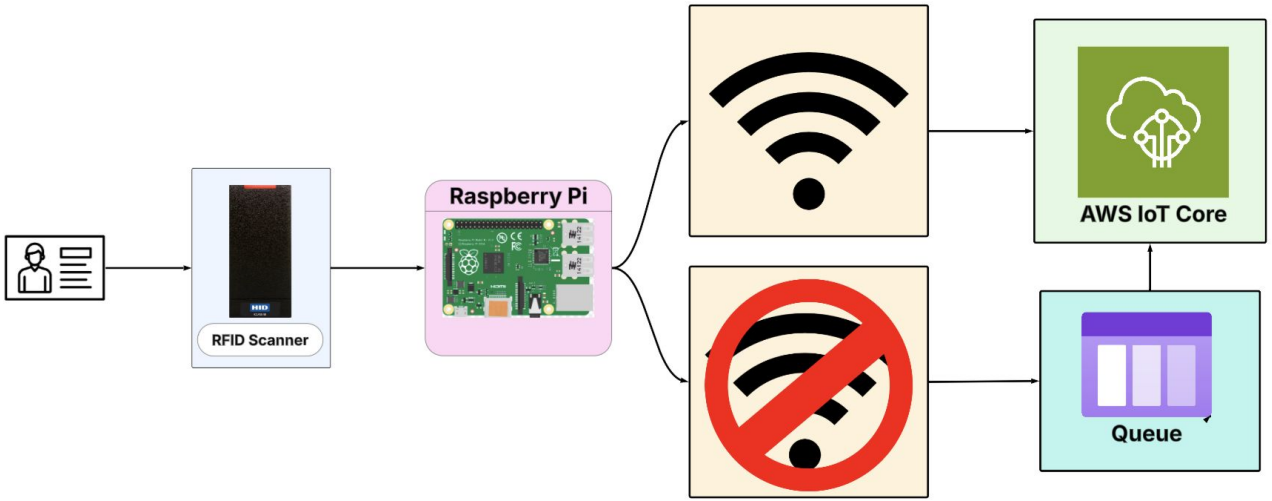
✓ Interpret access logs

✓ Identify intrusion alerts

✓ Access door

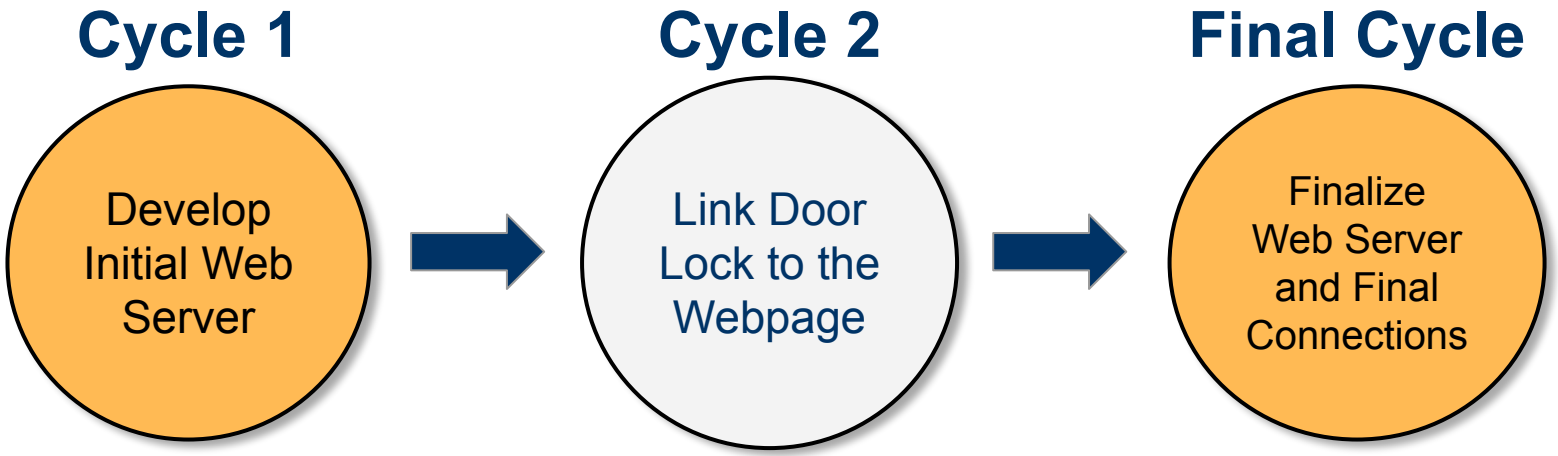
Prototype Demonstration

Prototype Demonstration Cont



Development Roadmap

Challenges & Resolutions



Obstacles:

- Initial AWS Struggles →Permission for Services
- Integration Issues →Lambda Functions & Docker Container
- Network Unreliable → Redundant Queue Events

Future Work (Version 2.0)

Automated Door Provisioning

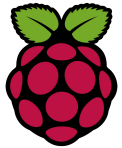
- Replace manual database entry
- Secure self-registration of locks
- Faster development at scale

Integrated Card Scanning

- Scan instead of typing card IDs
- Reduce human error
- Faster user onboarding

Conclusion

System



React

node

aws

Objectives

- **Secure** modern access control system
- **Remote** management & auditing
- **Reliable** operation in austere environments

Outcomes

- **Cloud-based** & **Secure** access control platform
- **Instant** Intrusion detection
- **Resiliant** System infrastructure
- **Protected** Internal Communication

Questions?