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The Motivation

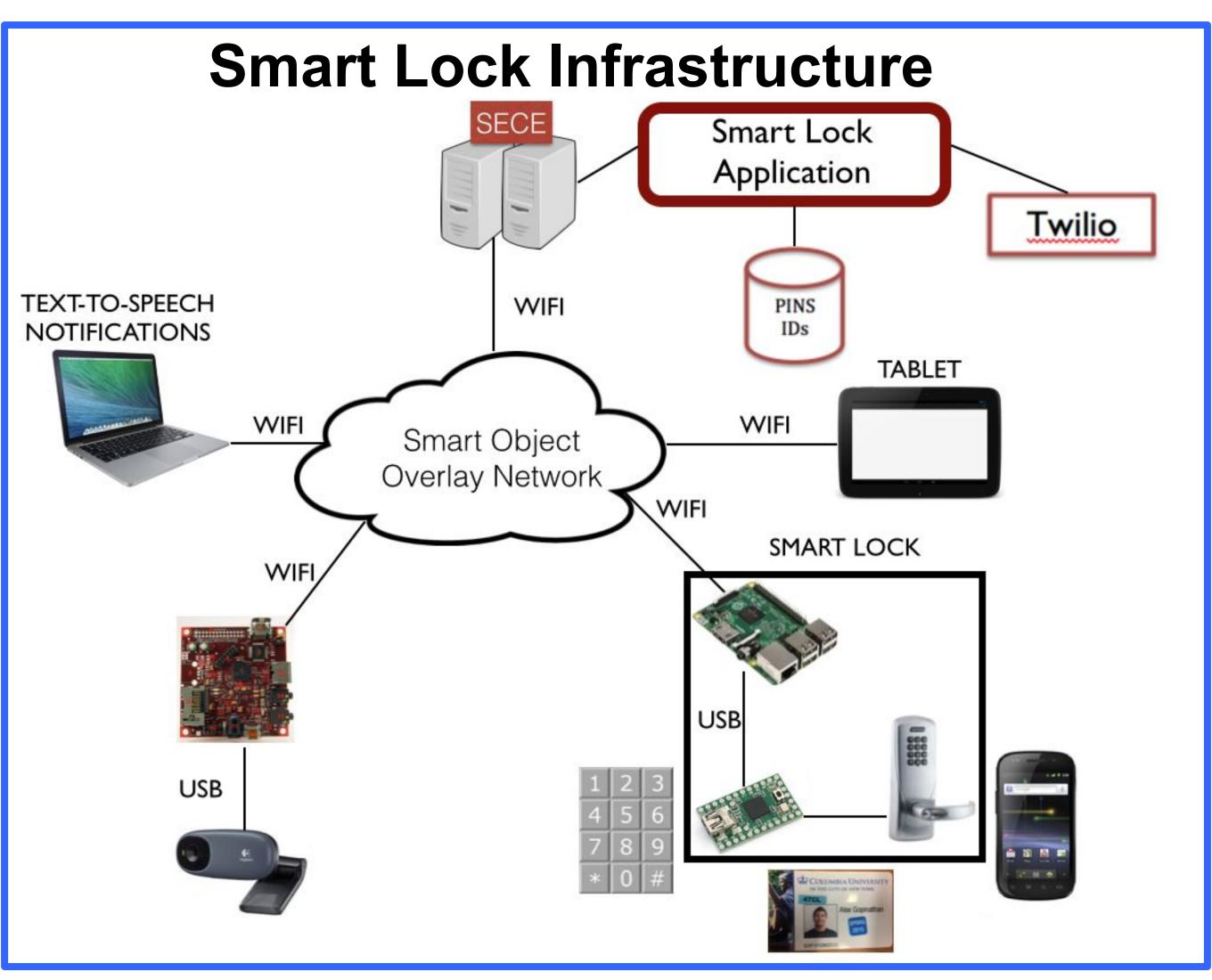
- Columbia's CS department has approximately 20-30 door locks
- The Schlage door locks on campus are old, expensive, must be manually and individually programmed

The Result

An integrated locking system that allows CS department administrators

Added Features

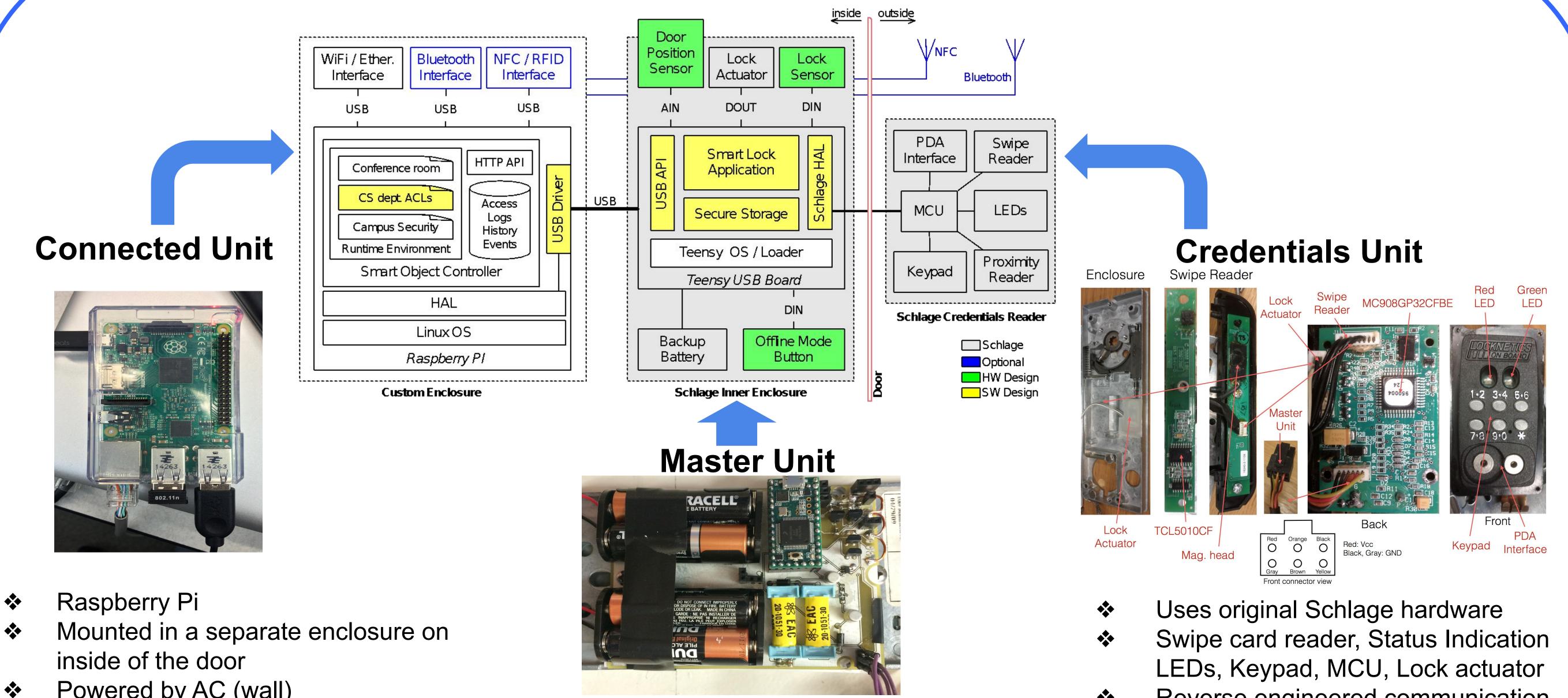
- Real Time Monitoring
- Bluetooth and Wifi
- Online Programming
- Commonly Available Platforms Open Source Software/Hardware





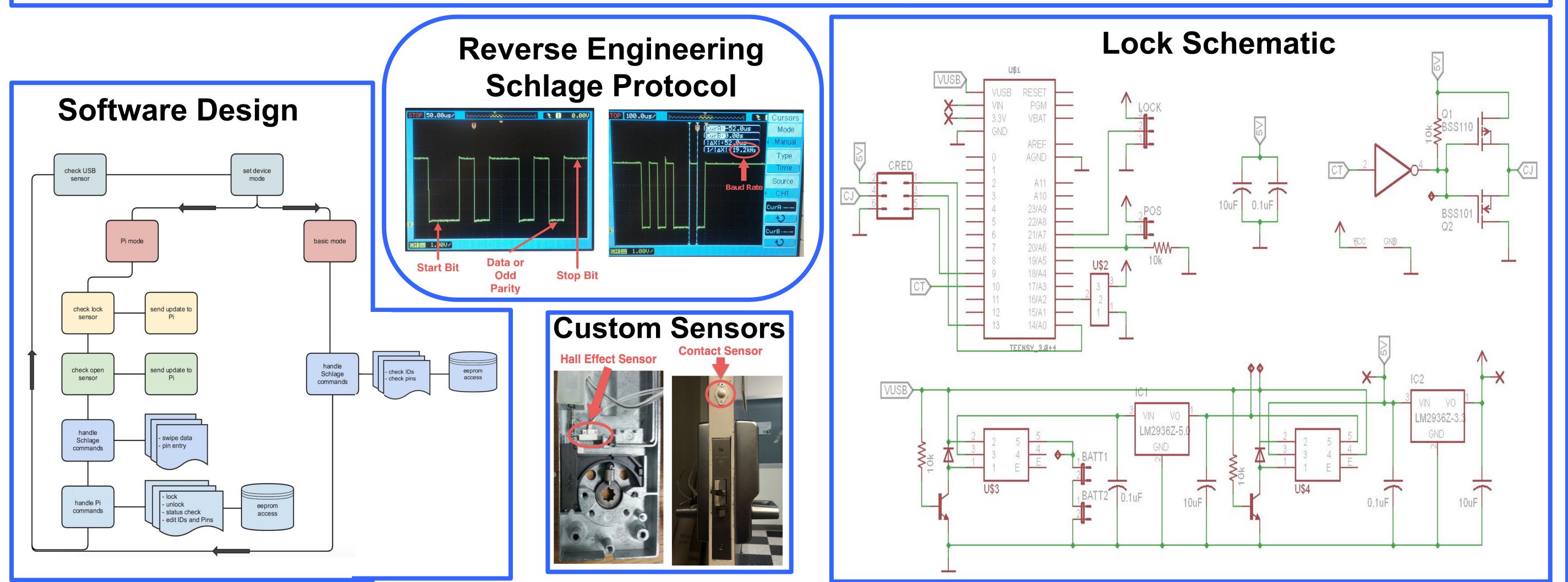
- **Custom Sensors**
- Reuse Schlage Hardware

Smart Lock Architecture



- Powered by AC (wall)
- Powers the Master Unit via USB *
- Contains WiFi/Bluetooth Interface
- Unit is optional for operation *
- Maintains a secure encrypted * connection to the server
- Custom designed PCB featuring a Teensy **USB-based** microcontroller
- Kept the original Schlage enclosure *
- Drop in replacement for Schlage Master Unit *
- Teensy runs our own "Smart Lock Application" **
 - Online Mode (app delegated to the server)
 - Offline Mode (emulates Schlage lock)

- Reverse engineered communication protocol to gain access to these components
- Added two new sensors **
 - Magnetic lock/unlock sensor
 - Door close/open contact sensor



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