Automating Your Home with Python, Raspberry Pi and HomeKit

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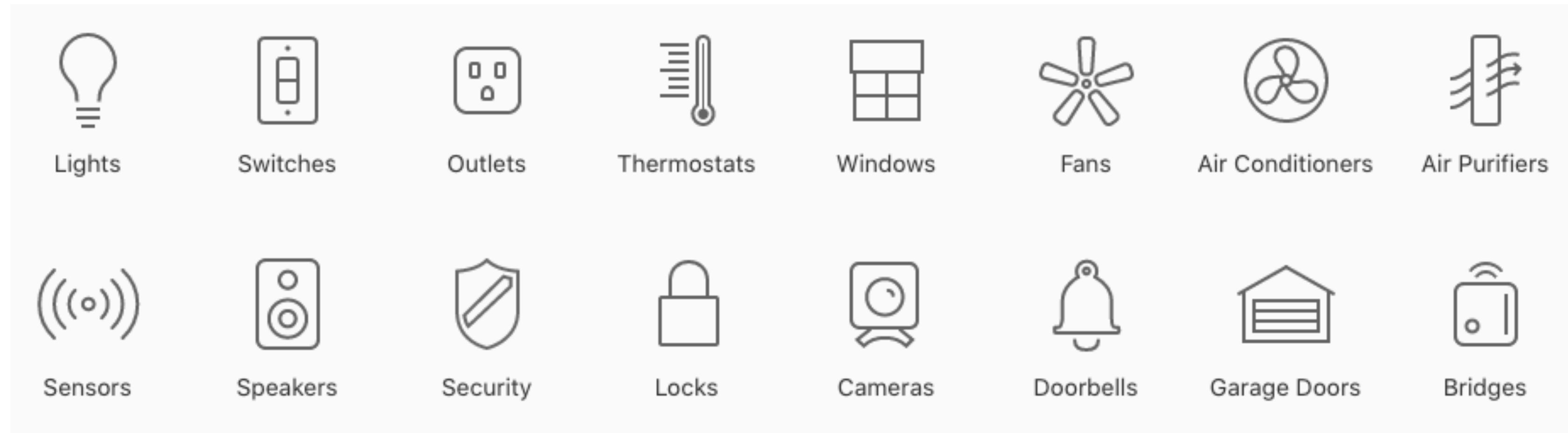
Why on earth would anyone want to trust their house to the cloud
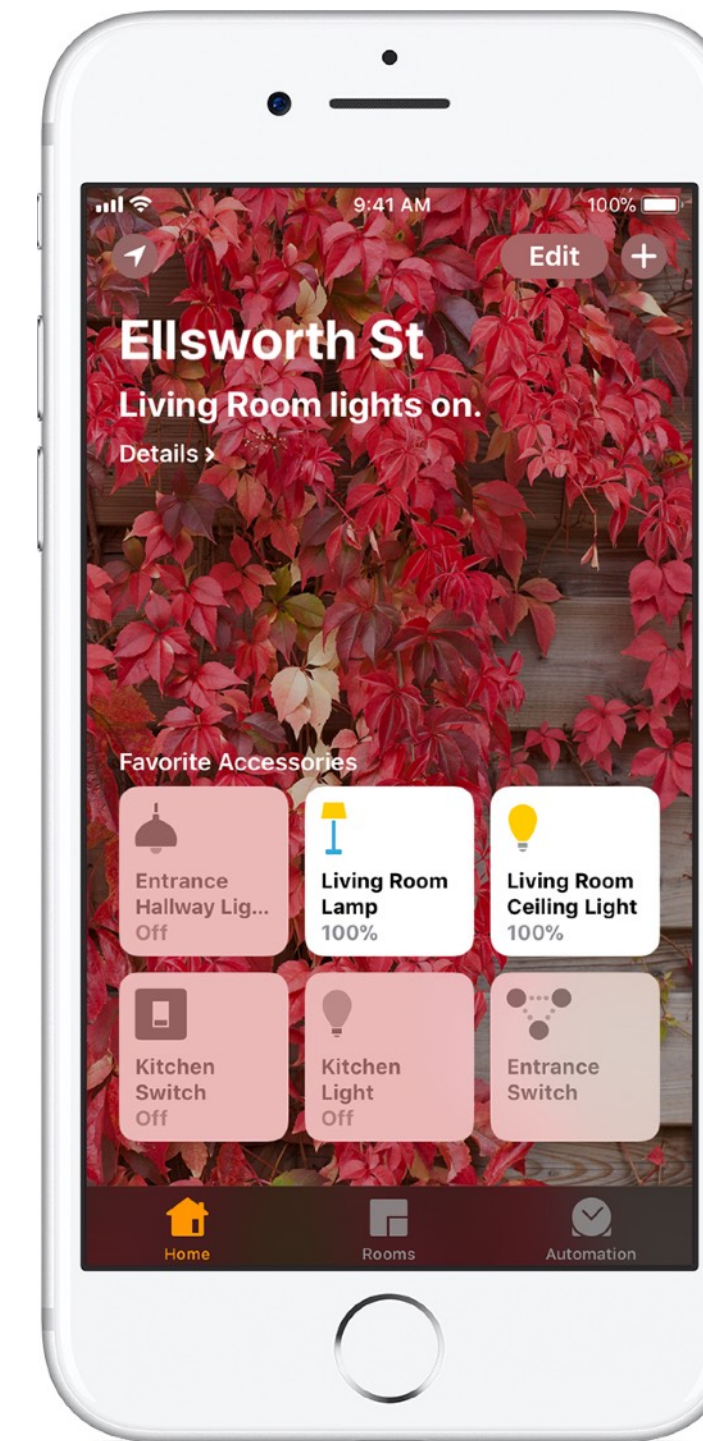
HomeKit

- Software framework for controlling "smart" hardware
- Built on Apple's "open" HomeKit Accessory Protocol
- Limited to pre-existing accessory + services
- Has quite a few open implementations

Lights   Switches   Outlets   Thermostats   Windows   Fans   Air Conditioners   Air Purifiers

Sensors   Speakers   Security   Locks   Cameras   Doorbells   Garage Doors   Bridges

Accessories

- Predefined hardware configurations provided by Apple
- Each comes with a set of Characteristics
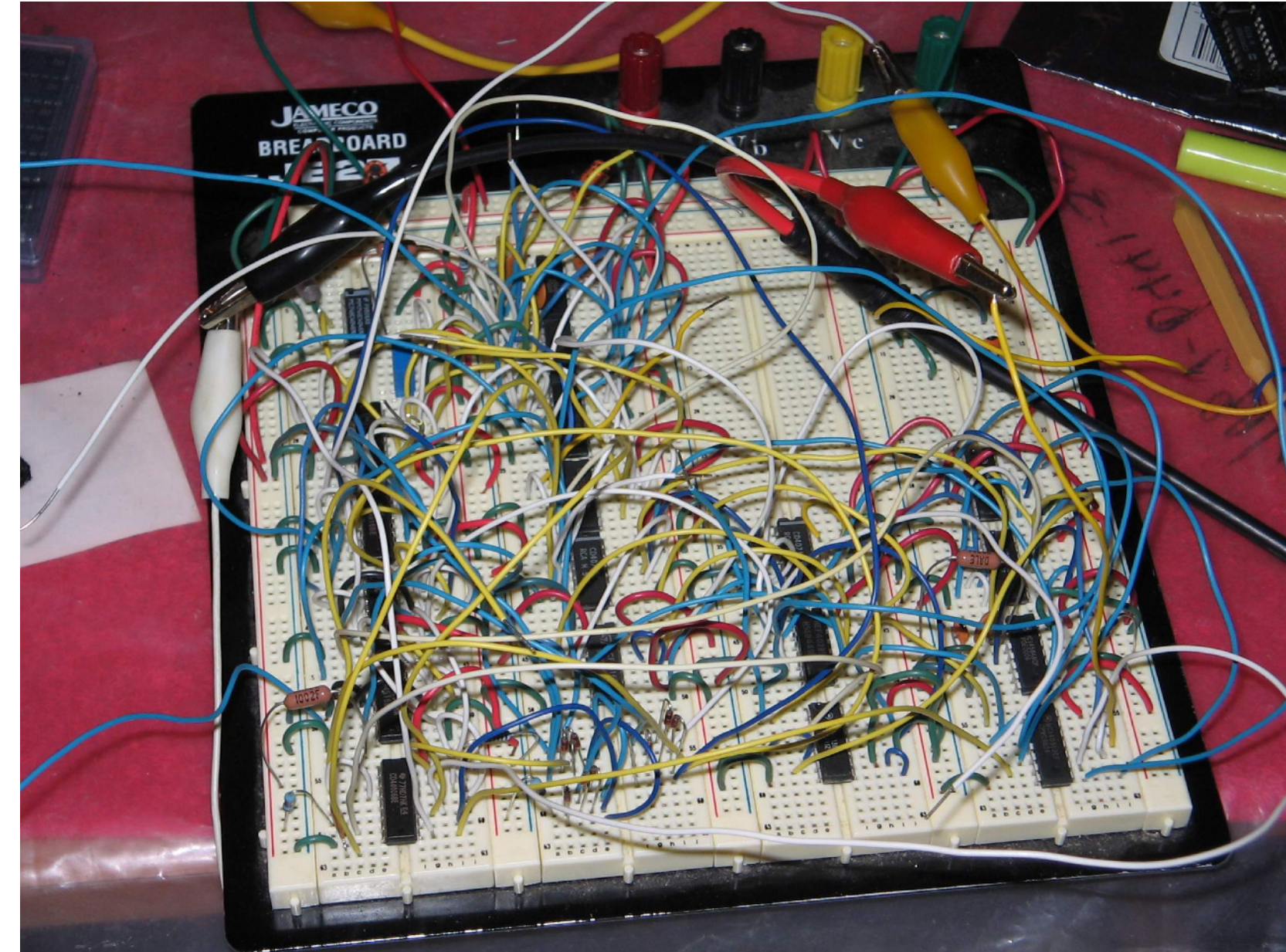- Some Characteristics programmable, sync, async

Home App

- Allows manual and automated control of devices
- Can configure automation based on events
- Remote access when paired with a home device (HomePod, AppleTV, iPad)

Raspberry Pi

- Cheap, reliable, first class support for HAP-Python
- Standard automation for "smart" accessories
- Benefits of Linux ecosystem like native GPIO LIRC

Infrared LIRC

- Out of the box support for IR receivers and transmitters
- Huge wealth of existing automation configurations for LIRC

Let's build an Accessory!

HAP-Python

01 **Build an AccesoryDriver**

02 **Create our Accessory**

03 **Setup our Characteristics**

04 **Start the driver**

Okay, let's just add ourselves an air conditioner then

```
CATEGORY_OTHER = 1
CATEGORY_BRIDGE = 2
CATEGORY_FAN = 3
CATEGORY_GARAGE_DOOR_OPENER = 4
CATEGORY_LIGHTBULB = 5
CATEGORY_DOOR_LOCK = 6
CATEGORY_OUTLET = 7
CATEGORY_SWITCH = 8
CATEGORY_THERMOSTAT = 9
CATEGORY_SENSOR = 10
CATEGORY_ALARM_SYSTEM = 11
CATEGORY_DOOR = 12
CATEGORY_WINDOW = 13
CATEGORY_WINDOW_COVERING = 14
CATEGORY_PROGRAMMABLE_SWITCH = 15
CATEGORY_RANGE_EXTENDER = 16
CATEGORY_CAMERA = 17
```

But I saw it in the list!

Thermostats Windows Fans Air Conditioners

Then what's an Air Conditioner?

Thermostats + Fans = Air Conditioners

Lessons Learned

- Variable speed controls will send every state in between
- System only as secure as your iCloud control
- Nobody is going to steal your data but your family might flick your lights on and off
- Siri has some interesting interpretations of what you want

Siri set that Santa max
Tap to Edit >

There's no one in your contacts matching 'Santa max'.

Siri set the Fanta 25%
Tap to Edit >

Hmm, I can't do that with HomeKit because I'm not sure what you mean by "Fanta".

Open the Home app

Siri set the Airconditioner to hot
Tap to Edit >

Okay, I'm warming the temperature from 0°C to 1°C.

Siri turn Airconditioner on high
Tap to Edit >

OK, I set the Airconditioner to about 100°F.

Code

Demo

Links

https://github.com/ikalchev/HAP-python

https://developer.apple.com/support/homekit-accessory-protocol/

Workarounds for running LIRC on Raspian
https://gist.github.com/prasanthj/c15a5298eb682bde34961c322c95378b