

# SECURE HOME GATEWAY PROJECT

- PROTOTYPE VISION
- SYSTEM ARCHITECTURE
- DEMO
- NEXT STEPS



Lead by:

Jacques Latour, CTO, CIRA Labs  
Canadian Internet Registration Authority  
Jacques.Latour [at] cira.ca  
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Presented by: Michael Richardson

<mcr@sandelman.ca> (ASN 26227)

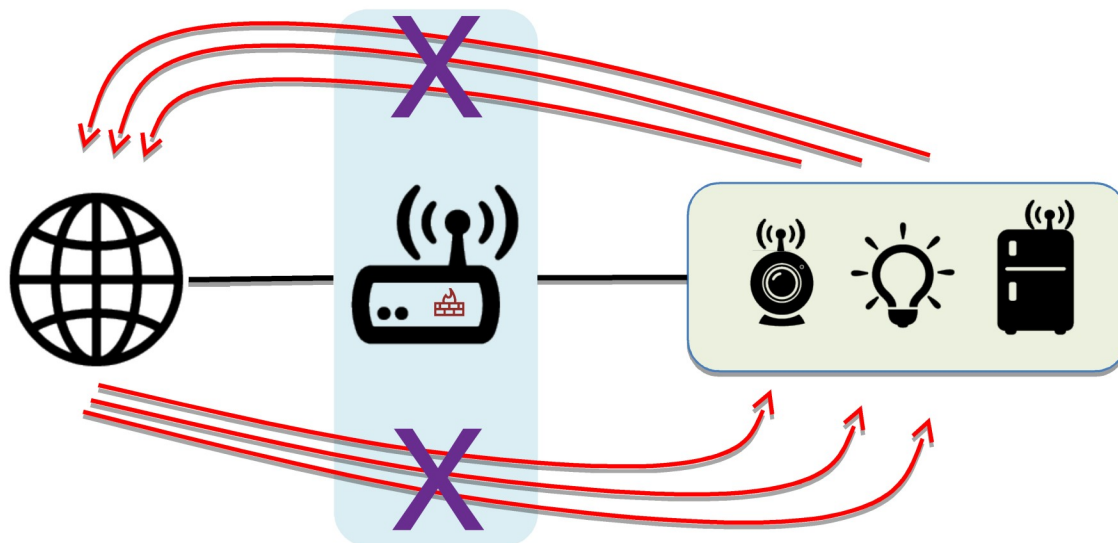
These slides at:

<https://goo.gl/4q9RSX>



# Secure Home Gateway (SHG) Primary Project Goal

- The primary goal of this project is to develop a secure home gateway that;
  - **protects** the internet from IoT devices **attacks** and
  - **protects** home IoT devices from the internet **attacks**



# Why are we working on this?

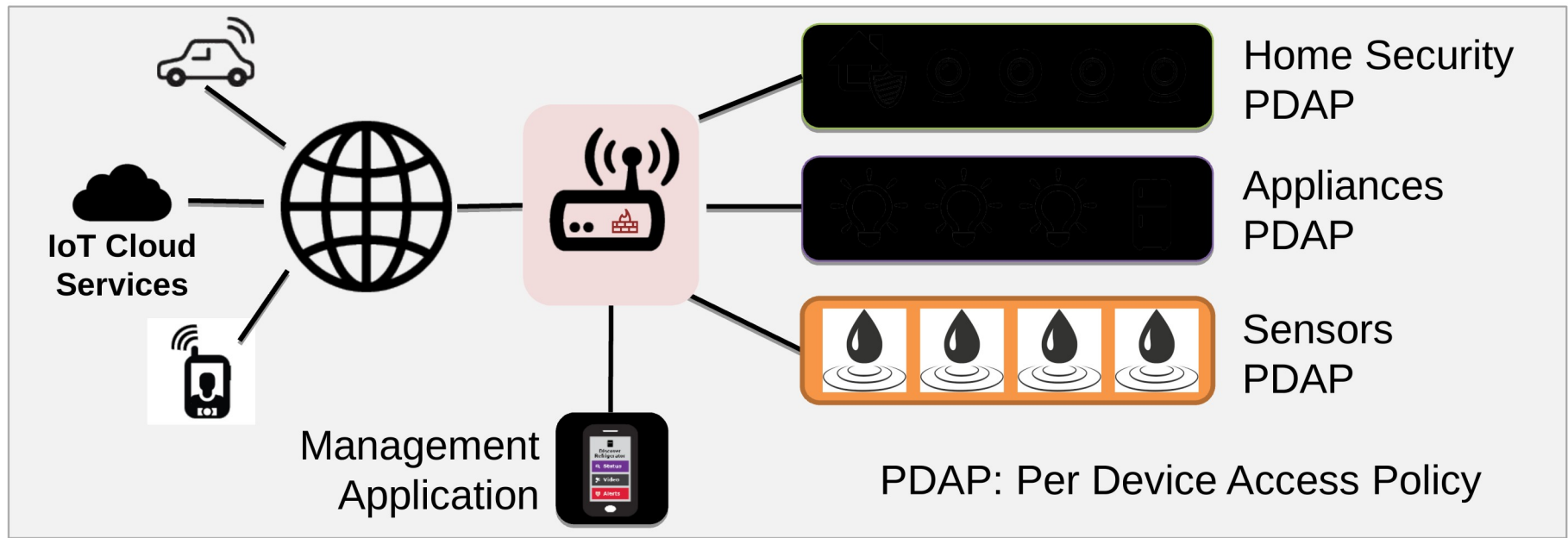
## -> Risk mitigation

- For many internet organizations like CIRA the #1 risk on the risk register is a large scale (Dyn like) DDoS attack.
- One of the mitigation mechanisms for this risk is to prevent 'weaponization' of IoT devices
- Tightly controlling access 'to' and 'from' IoT devices inside the home or small office network is key to preventing 'weaponization' and causing harm on the internet.
- The **threat** that **IoT devices** bring is the **scale of attacks**. The uncontrolled access of million/billions of IoT devices to and from the internet is the threat we need to mitigate.

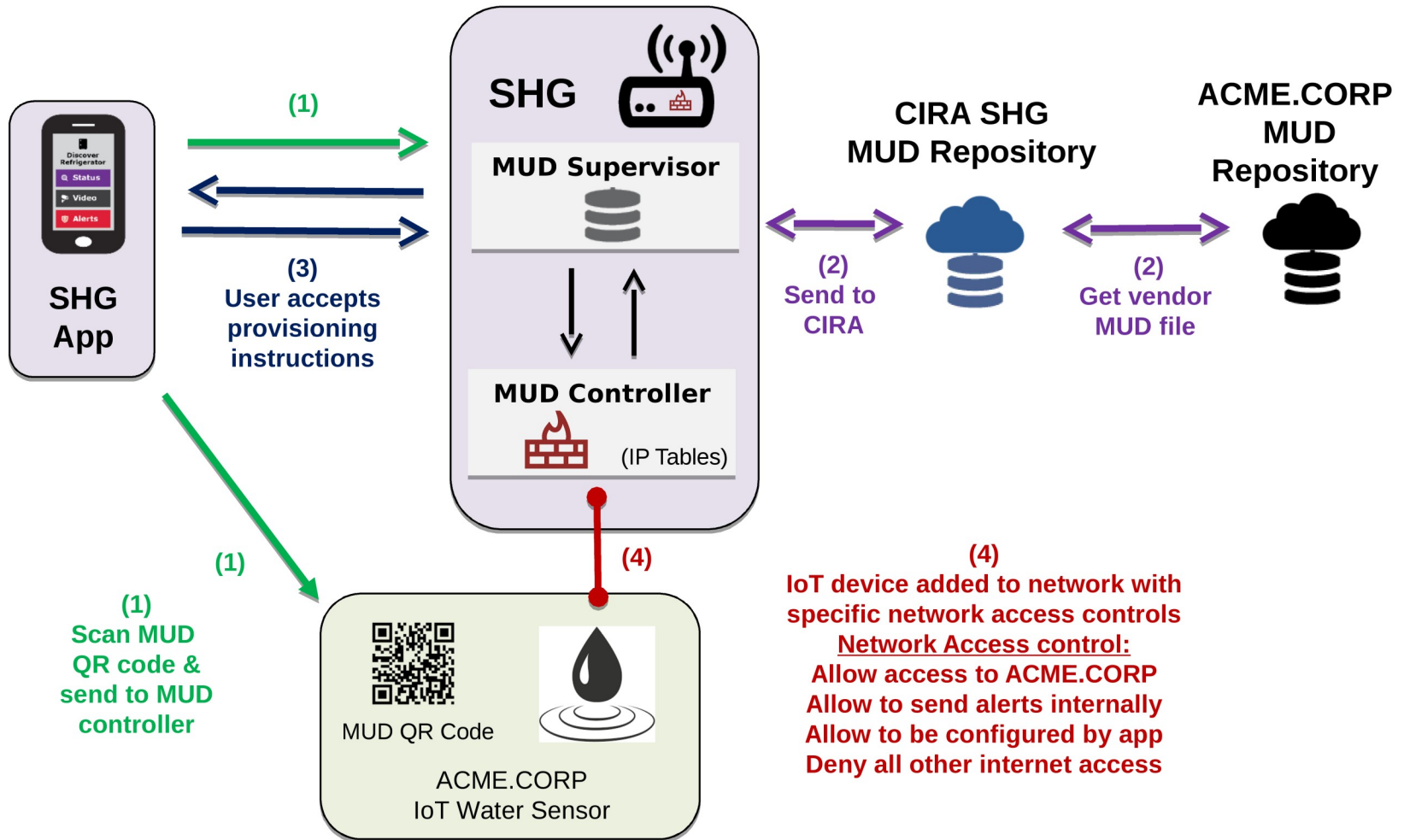
# How can we protect IoT devices?

-> Best practice & new standards

- Rule #1: Identify IoT devices on your home network
- Rule #2: Place a policy around the IoT device that restricts it to a specific function (default is no access)
- Rule #3: Monitor for behavioural changes in the device and quarantine at the first sign of change.

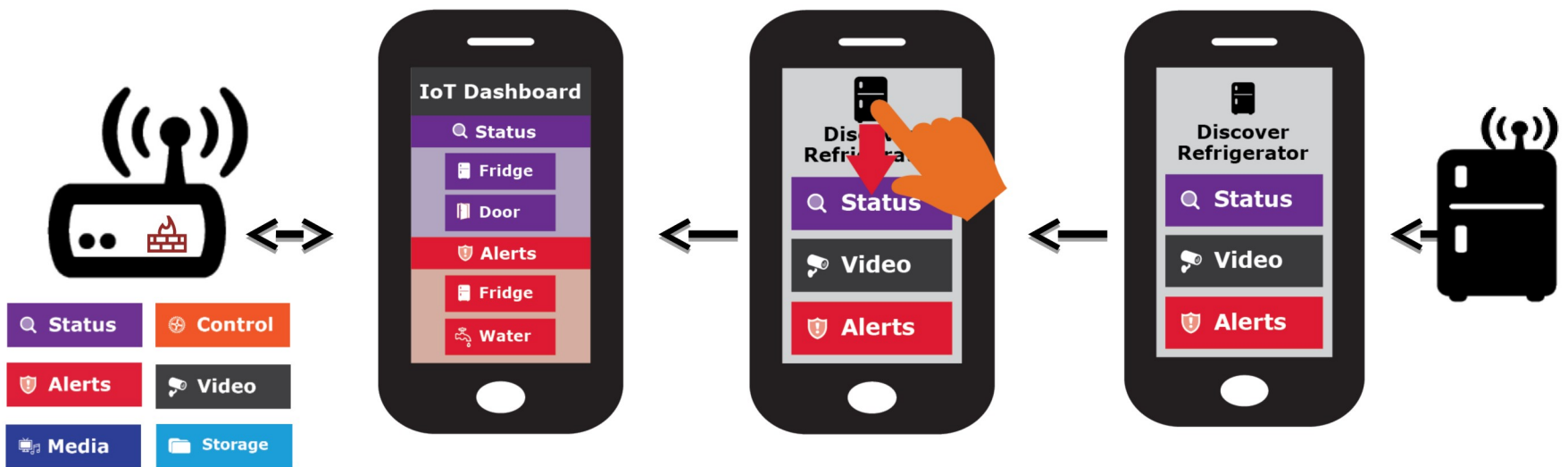


# High Level MUD & IoT Device Provisioning Workflow



# Simple user interface is key to this project: **Swipe UP, DOWN, LEFT and RIGHT**

- Gateway provisioning, device discovery, device provisioning must be as simple as possible, intuitive for non experienced users, available as framework for default open source app.



Tinder for IoT Devices!

**You guess it!** That's why we need a  
**simple provisioning interface**  
this stuff is complex!



DEMO VIDEO:

<https://www.youtube.com/watch?v=LauvEBa4Z4s>

Campaign

FAQ 35

Updates 12

Comments 595

Community

Share this project

Save



Silo: one-touch connected vacuum system for 5x fresher food

Project We Love Brooklyn, NY Food

Meet Silo, your new countertop staple. Silo is a revolutionarily simple vacuum-sealing container system that keeps your food fresher, longer. Its patented one-touch vacuum technology combined with the IoT infrastructure (Alexa built-in!) ensures your farmers market finds and holiday leftovers last 2-5 times longer.

We believe that a more efficient and more rewarding kitchen starts with vacuum-sealing our food — and creating a better way to manage it.



**\$1,424,565**  
pledged of \$80,000 goal

**5,417**

Pledge US\$ 1 or more

Freshness Pursuer

Thank you! We ALSO hate rotten strawberries! We'll send you all the updates and behind the scenes insights on everything happening at Silo ... plus our endless gratitude.

ESTIMATED DELIVERY Nov 2018

SHIPS TO Anywhere in the world

230 backers

Pledge US\$ 165 or more

Basic Stout - Earlybird

Get a Silo base (Black or White) plus 4 containers.

INCLUDES:

- Silo base with Alexa built-in
- 2x Small short container (2½ cups/0.6L)
- 2x Medium short container (5 cups/1.2L)

ESTIMATED DELIVERY Jul 2019

SHIPS TO Only certain countries

Reward no longer available

100 backers

Real IoT Device:

<https://www.kickstarter.com/projects/simplifyfreshness/your-remarkably-simple-one-touch-connected-vacuum>



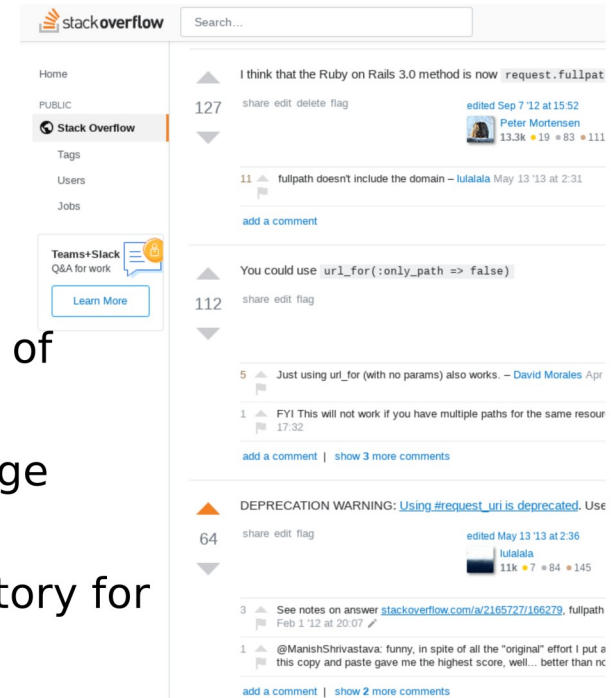
## Next Steps

- Move from hybrid OpenWRT/CZ.NIC firmware to pure OpenWRT firmware on Omnia Turris.
  - Look for alternate (cost-reduced) device platforms
- Integrate .NL Labs (SIDN) SPIN code, which does more behaviour based analysis of code.
  - Look at integration with NTOP's nDLP as well.
- More work at IETF: need some MUD extensions for firmware update, bandwidth quotas.
- Enrollment and bootstrap of devices: working with WiFi Alliance on making DPP deployable

Risk of too many chefs in kitchen!

# Things we need help with

- We need MUD profiles to be created for a wide variety of devices.
  - Can not depend upon manufacturer to provide usage descriptions.
  - Need to create a **curated, crowd sourced** repository for MUD profiles
    - Could be as simple as github repo.
    - Better if it is uservoice, or stack-overflow like.
    - Curators will need to be compensated.
  - Need a visual MUD file editor (single page browser app)
    - And a way to compare to MUD files visually
    - (good job for a Co-OP, but needs ongoing support)
- There is an open question about liability for DDoS attacks.
  - Figuring out who pays will determine who is going to make the investments above!



# What do you think?

<https://goo.gl/4q9RSX>



## Project Information

<https://github.com/CIRALabs/Secure-IoT-Home-Gateway>

## Prototype code

<https://github.com/CIRALabs/>