Internet Technology

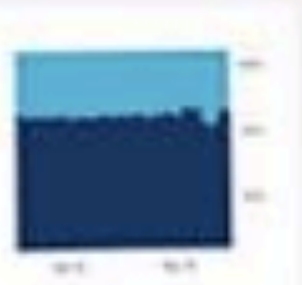
Where are we now?

date	time	lecture	lecturer
April 28	3+4 6+7	**Introduction** Exercises 1/5	Mattijs
May 3	1+2 3+4	**Applications and Multimedia** Exercises 2/5 + Lab 1/4	Mattijs
May 12	**3+4** 6+7	**Naming and Addressing** Exercises 3/5 + Lab 2/4	Mattijs
May 19	3+4 6+7	**Multiple Access and Wireless Networks** Exercises 4/5 + Lab 3/4	Mattijs
June 2	**3+4** **6+7**	**Internet of Things (IoT)** **Exercises 5/5 + Lab 4/4**	**Elmer**
June 9	3+4 6+7	Security and Privacy Lab wrap-up (**report dd. June 9** at 23:59)	Ramin
June 16		**Exam**	
July 7		**Resit**	

Securing the IoT

Elmer Lastdrager 2 June 2022

.nl stats and data



Stichting Internet Domeinregistratie Nederland (SIDN)

- Objective: increase society's confidence in the Internet

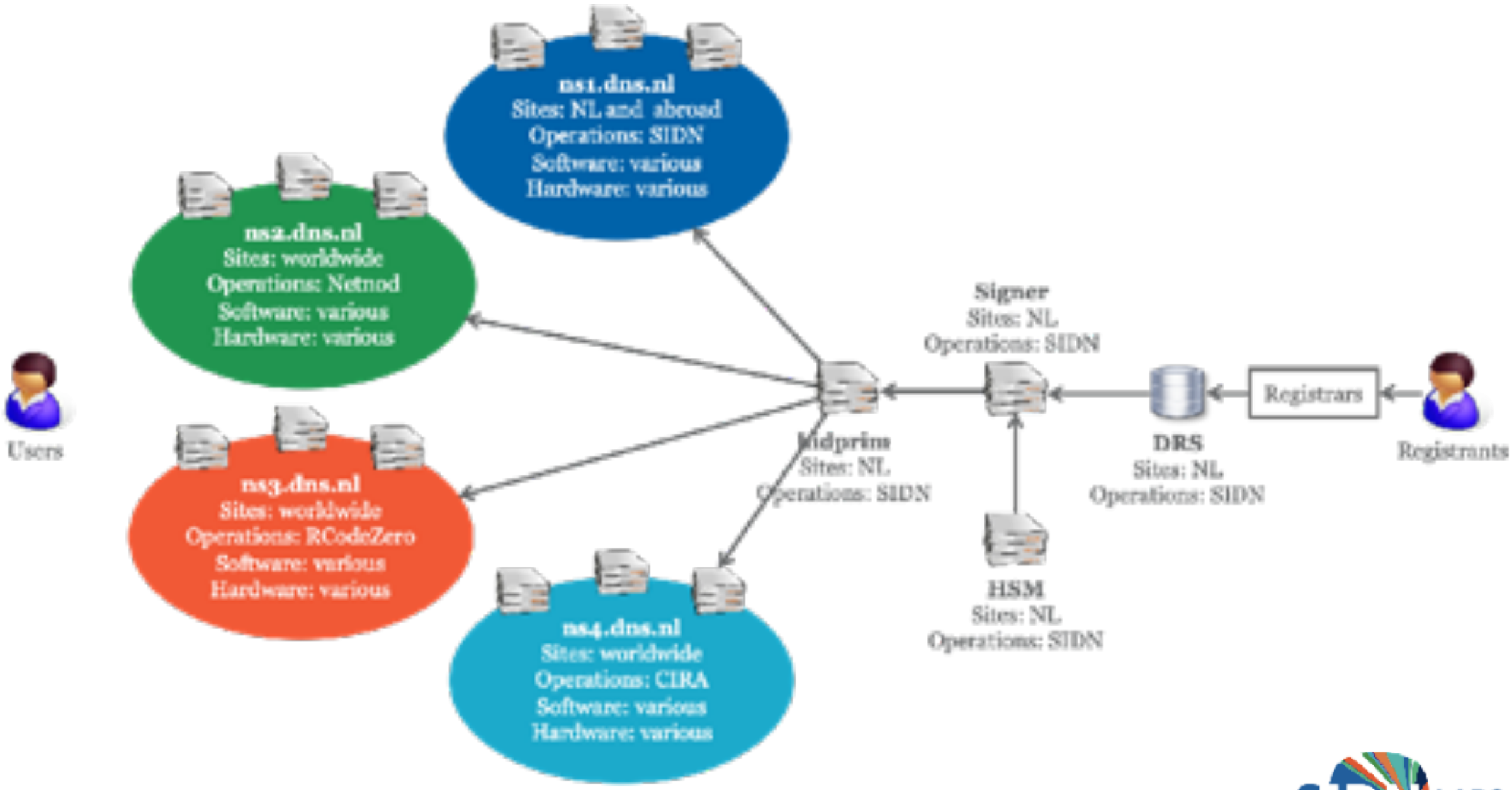
- Provide secure and fault-tolerant registry services for .nl
  - Anycasted DNS services with DNSSEC support
  - Registration and domain protection services

- Increase the value of the Internet in the Netherlands and elsewhere
  - Enable safe and novel uses (SIDN Fonds, IRMA)
  - Increase infrastructure security and trustworthiness (SIDN Labs)

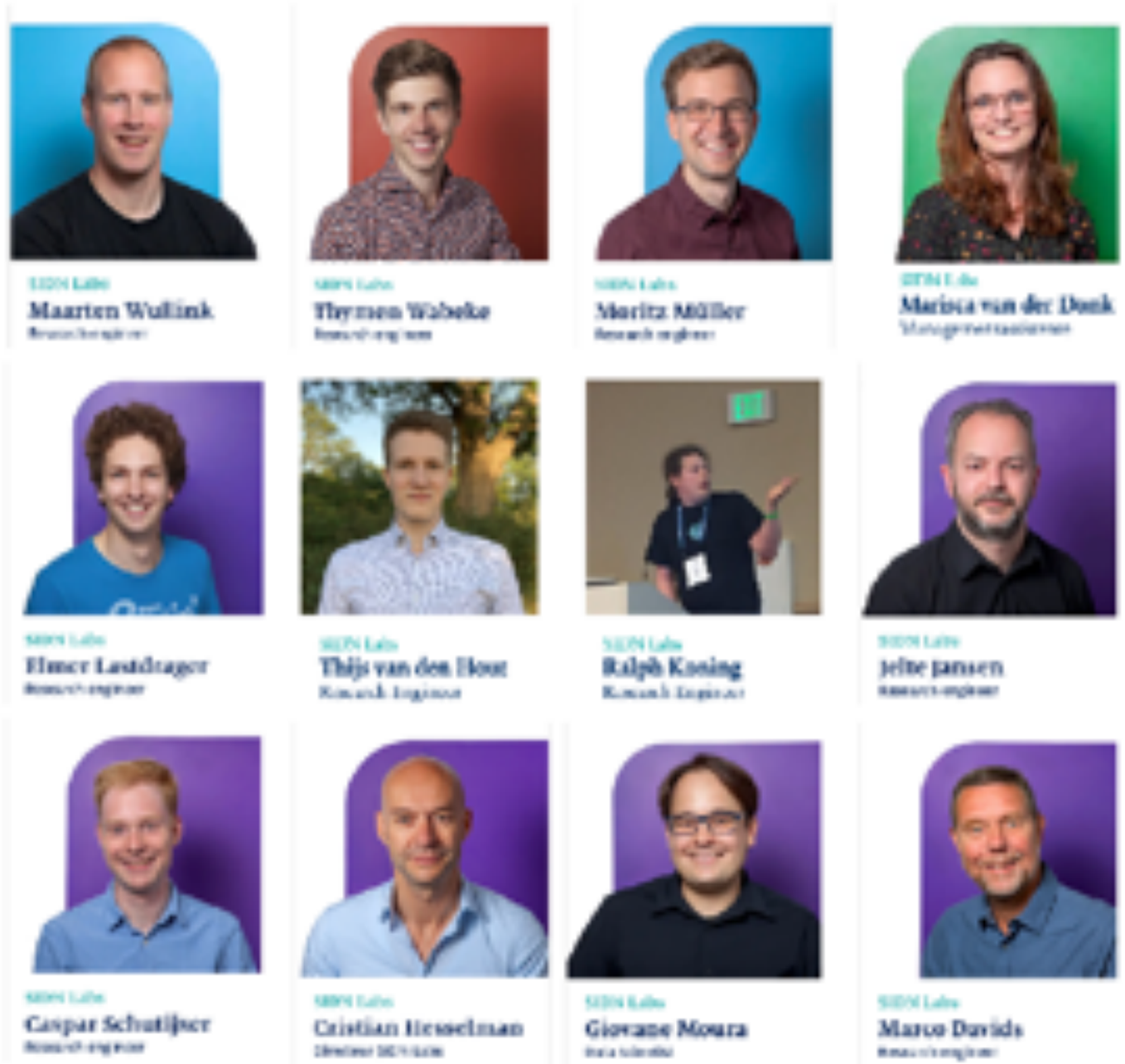
- Not-for-profit private organization with a public role based in Arnhem

.nl = the Netherlands
17M inhabitants
6.2M domain names
3.4M DNSSEC-signed
2.5B DNS queries/day
8.6B NTP queries/day

Heterogeneous and fault-tolerant DNS infrastructure



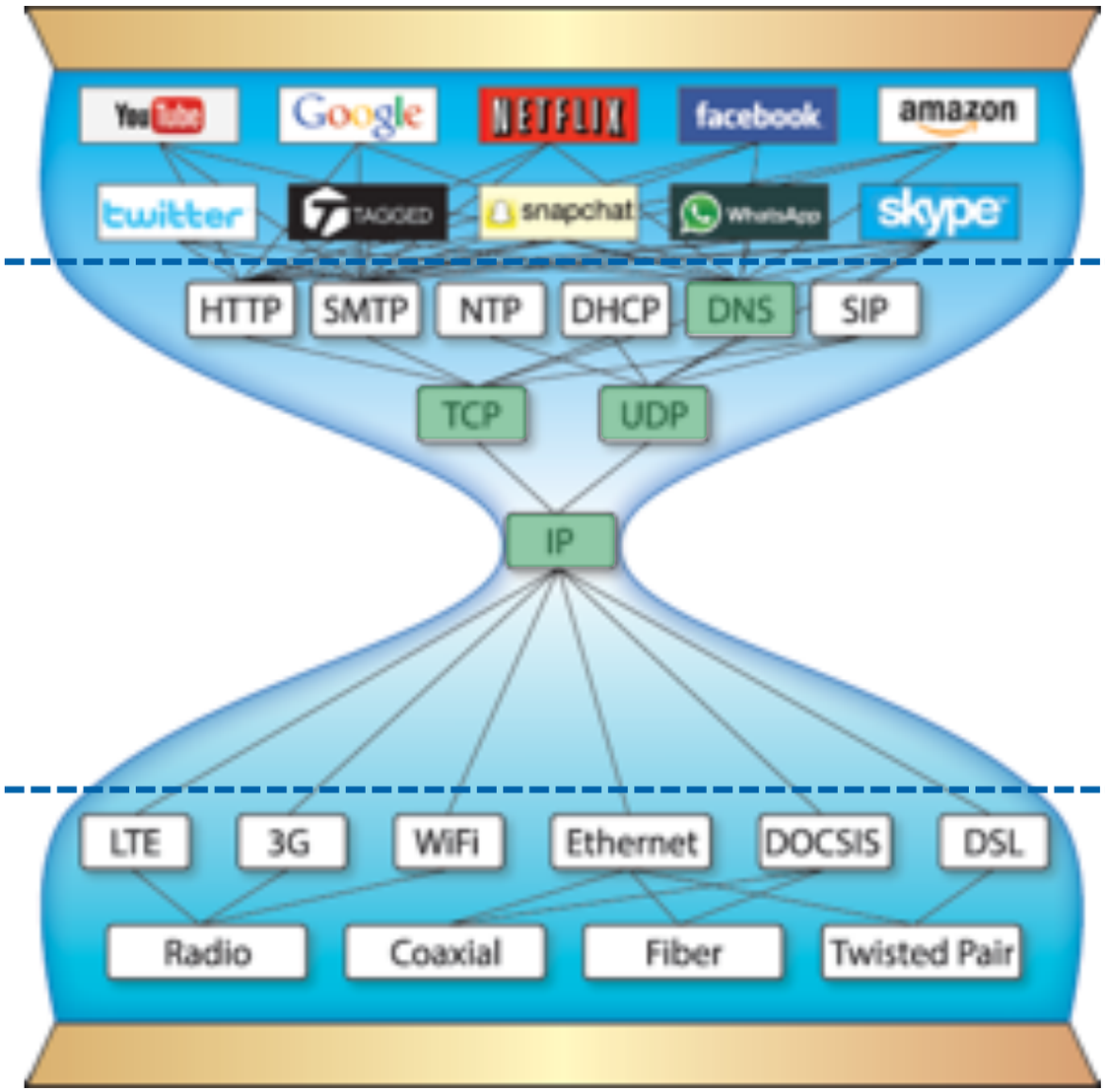
SIDN Labs



- Technical experts, divers in seniority and nationality
- Help SIDN teams, write open-source software, analyze large amounts of data, conduct experiments, write articles, collaborate with universities
- M.Sc students help us advance specific areas

Most people

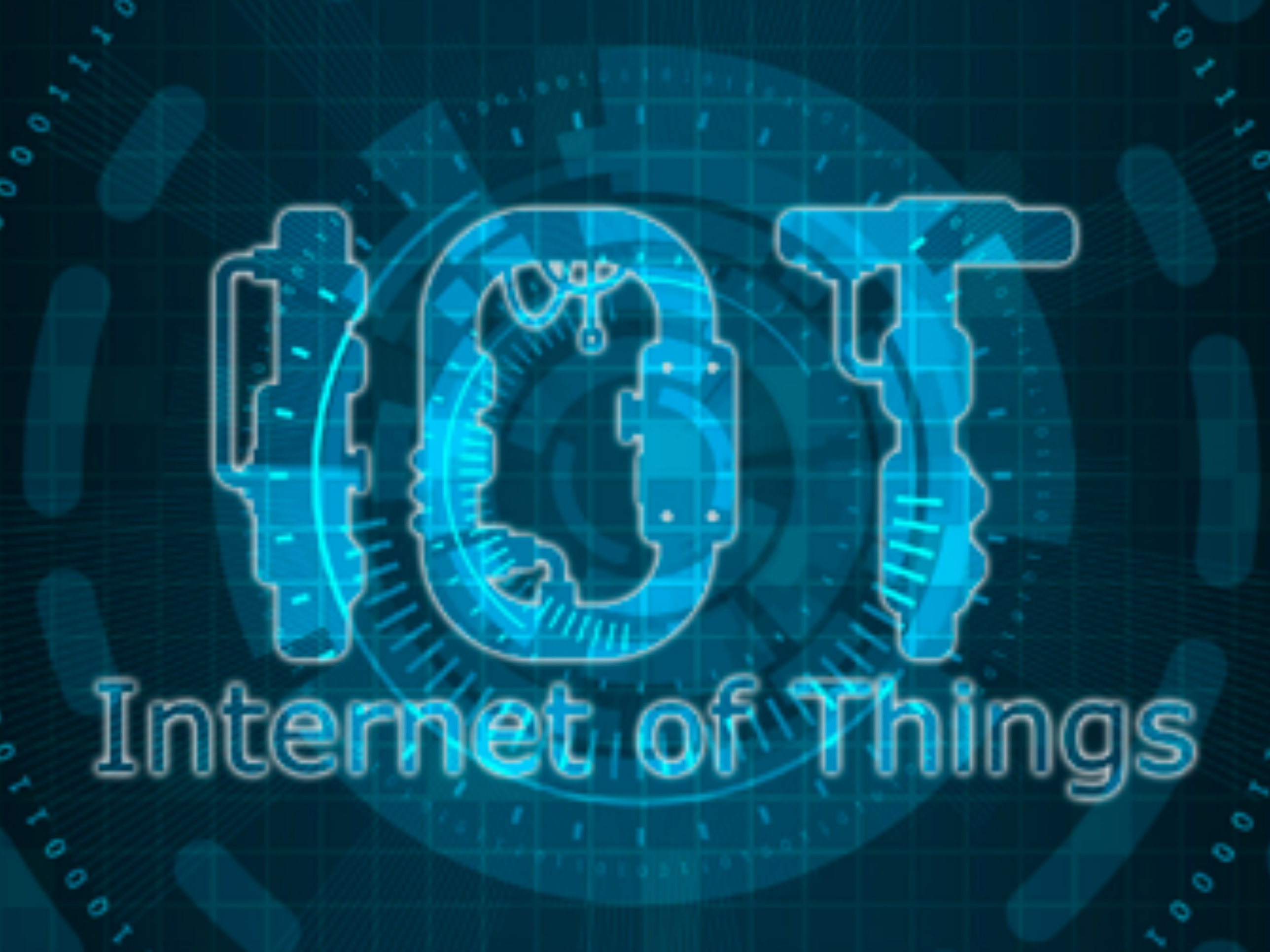
Us

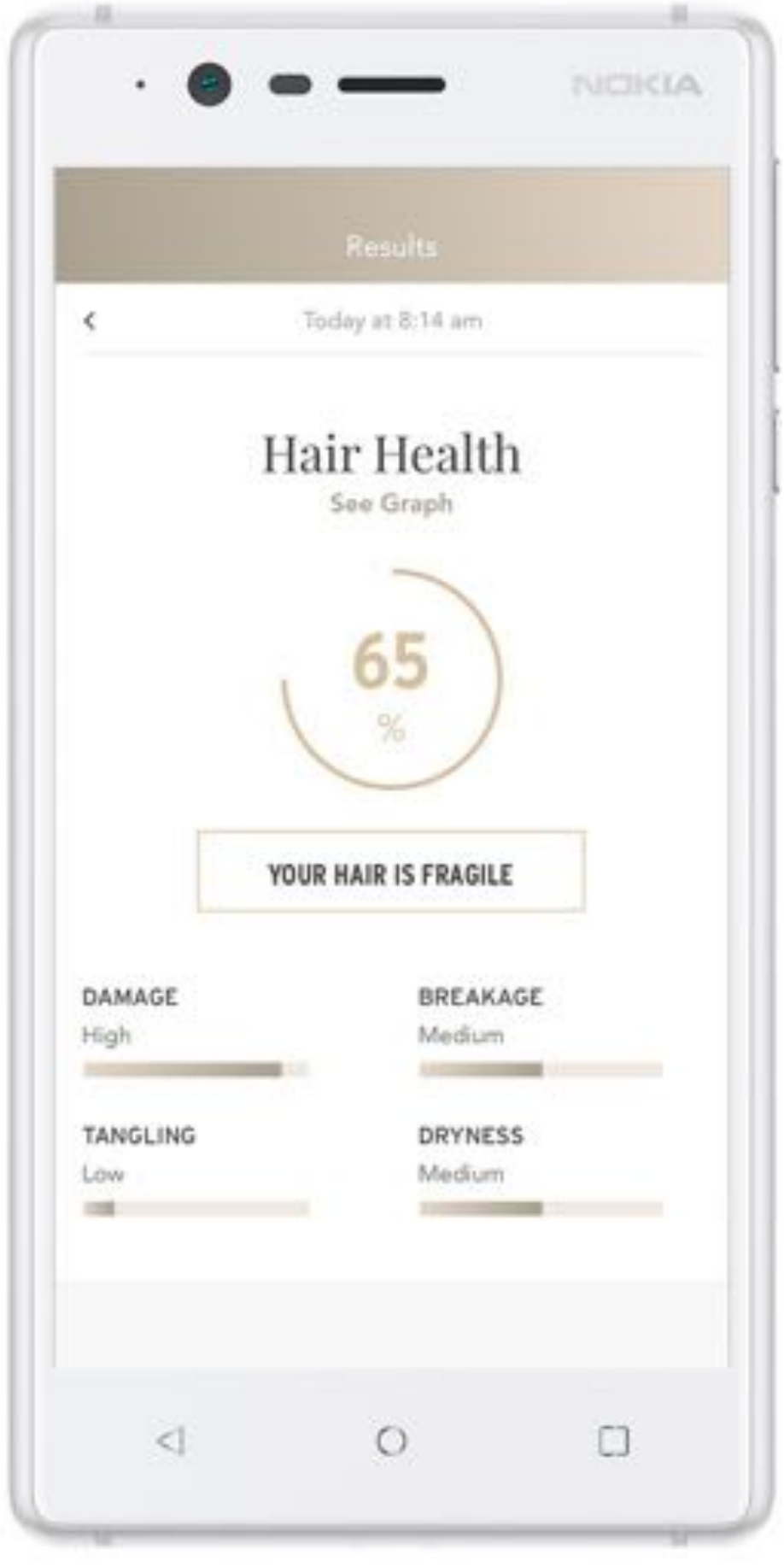


Services

Transmission

SDN LABS


IoT
Internet of Things


NOKIA
Results
Today at 8:14 am
Hair Health
See Graph
65
%
YOUR HAIR IS FRAGILE
DAMAGE
High
BREAKAGE
Medium
TANGLING
Low
DRYNESS
Medium

Como Huggies TweetPee funciona

Design ergonómico

Welcome to U by Moen
Demo the Controller and learn how easy it is to precisely control temperature, select shower outlets, and save your perfect shower as a preset for later.
100°
Demo the Smartphone App to see how the same easy controls are available in the palm of your hand, along with up to 10 additional presets.

SMALT with voice

Connect SMALT with Amazon Echo and simply say “Alexa, dispense half a teaspoon of salt".

Bring the flavor

SMALT dispenses salt with a shake/pinch of your smartphone screen or simply turning the dial manually.

What does i.Con do with its data? Can I use it anonymously?

“Absolutely! All data will be kept anonymous but users will have the option to share their recent data with friends, or, indeed the world. You will be able to anonymously access stats that you can compare with i.Con users worldwide.”

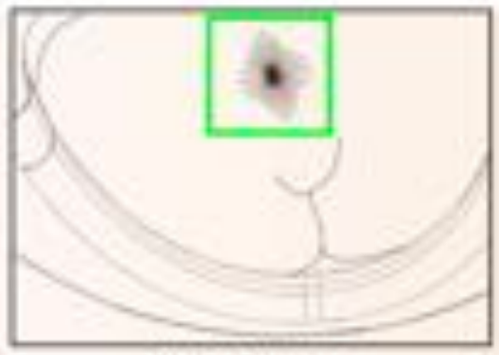
Urinalysis

Uroflowmetry

Bristol stool form scale

Seating time
defecation time

(i) Pressure sensor
(ii) Motion sensor (PIR)
(iii) Urinalysis strip
(iv) Stool camera
(v) Anus camera
(vi) Uroflow camera



Analprint scan

Fingerprint scan

Cloud-based
health portal

YOU GET CONNECTED!
AND YOU GET CONNECTED!
EVERYTHING GETS CONNECTED!

SLIDESHOW

The internet of insecure things: Thousands of internet-connected devices are a security disaster in the making

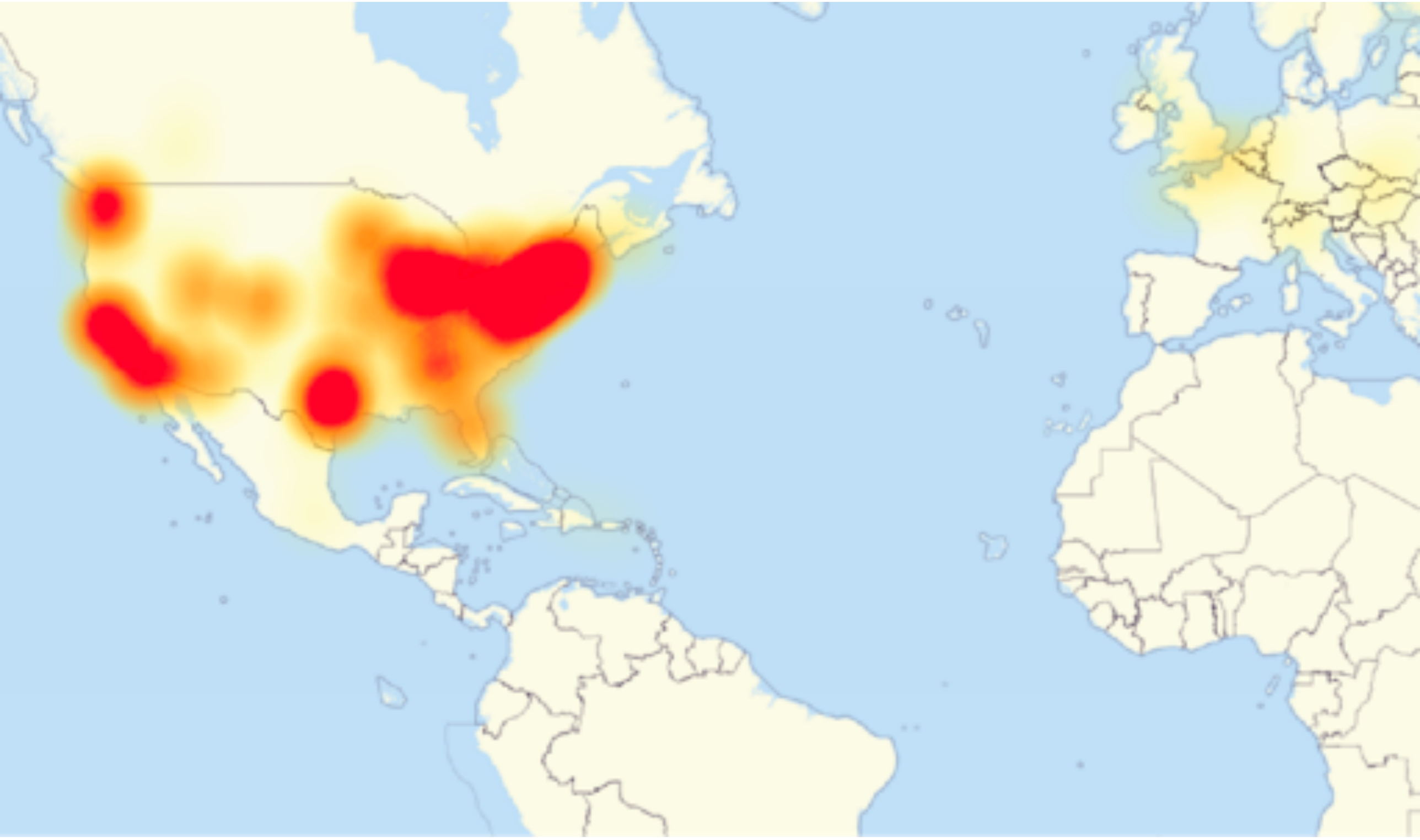
By Josh Fruhlinger, CSO | Oct 12, 2016 4:00 AM PT

The "S" in IoT
stands for
SECURITY

Mirai vs Dyn SM

1.2 Tbps

From ‘only’ 100.000 devices



This guy's light bulb performed a DoS attack on his entire smart house

Kashmir Hill

3/03/15 9:41am | Filed to: REAL FUTURE

RISK ASSESSMENT —

BrickerBot, the permanent denial-of-service botnet, is back with a vengeance

New botnet squadrons wage fiercer, more intense attacks on unsecured IoT devices.

DAN GOODIN - 4/24/2017, 10:43 PM

SECURITY IS SEXY

By Darlene Storm, Computerworld | FEB 2, 2015 12:09 PM PT

About

Most security news is about insecurity, hacking and cyber threats, bordering on scary. But when security is done right, it's a beautiful thing...sexy even. Security IS sexy.

NEWS ANALYSIS

Hacker hijacks wireless Foscam baby monitor, talks and freaks out nanny

This is the third time news has circulated about some jerk hijacking a wireless Foscam camera/baby monitor and made his virtual intrusion known by talking. Please change the default password!

MORE LIKE THIS

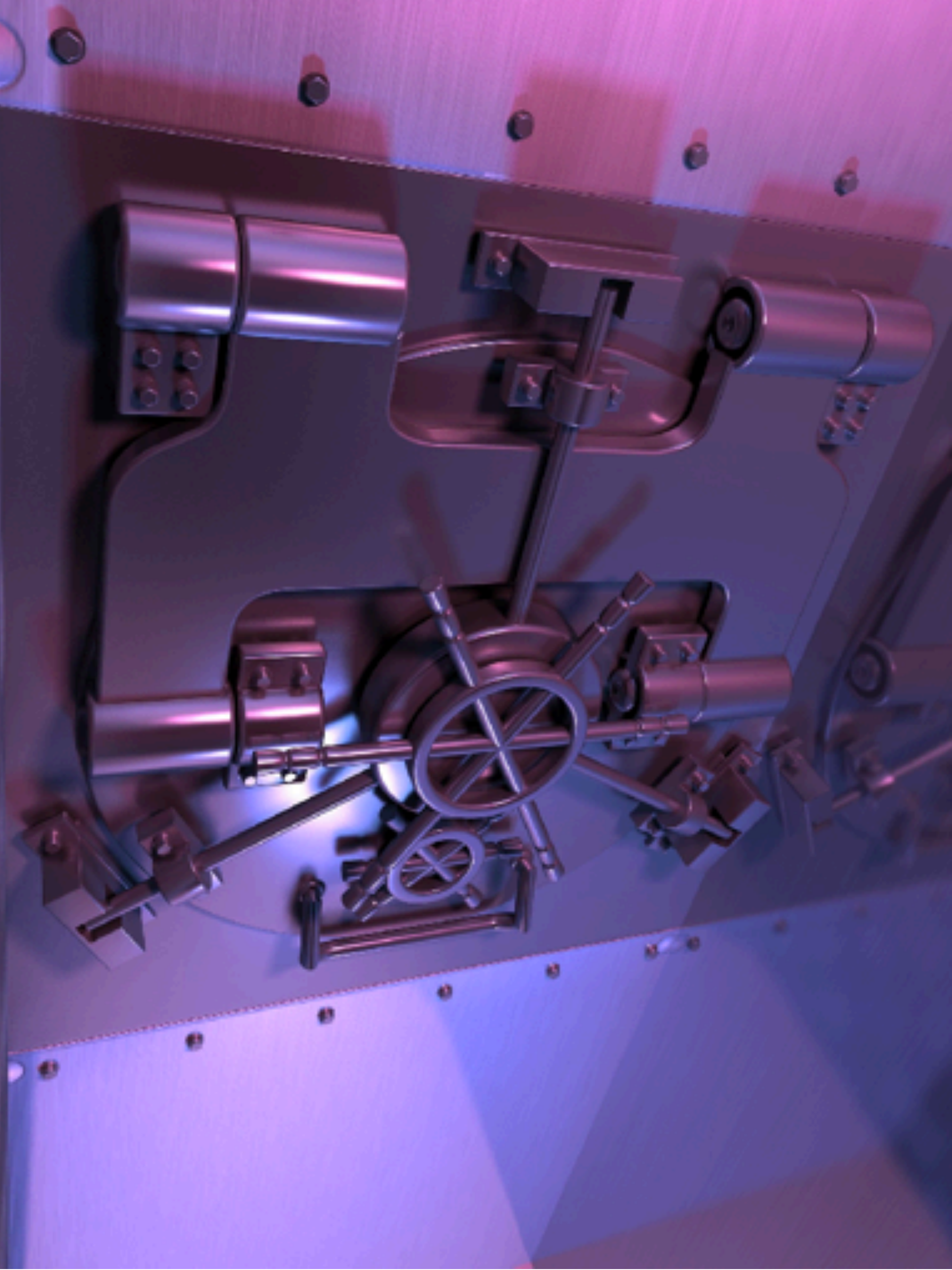
Hacker strikes again: Creep hijacks baby monitor to scream at infant and...

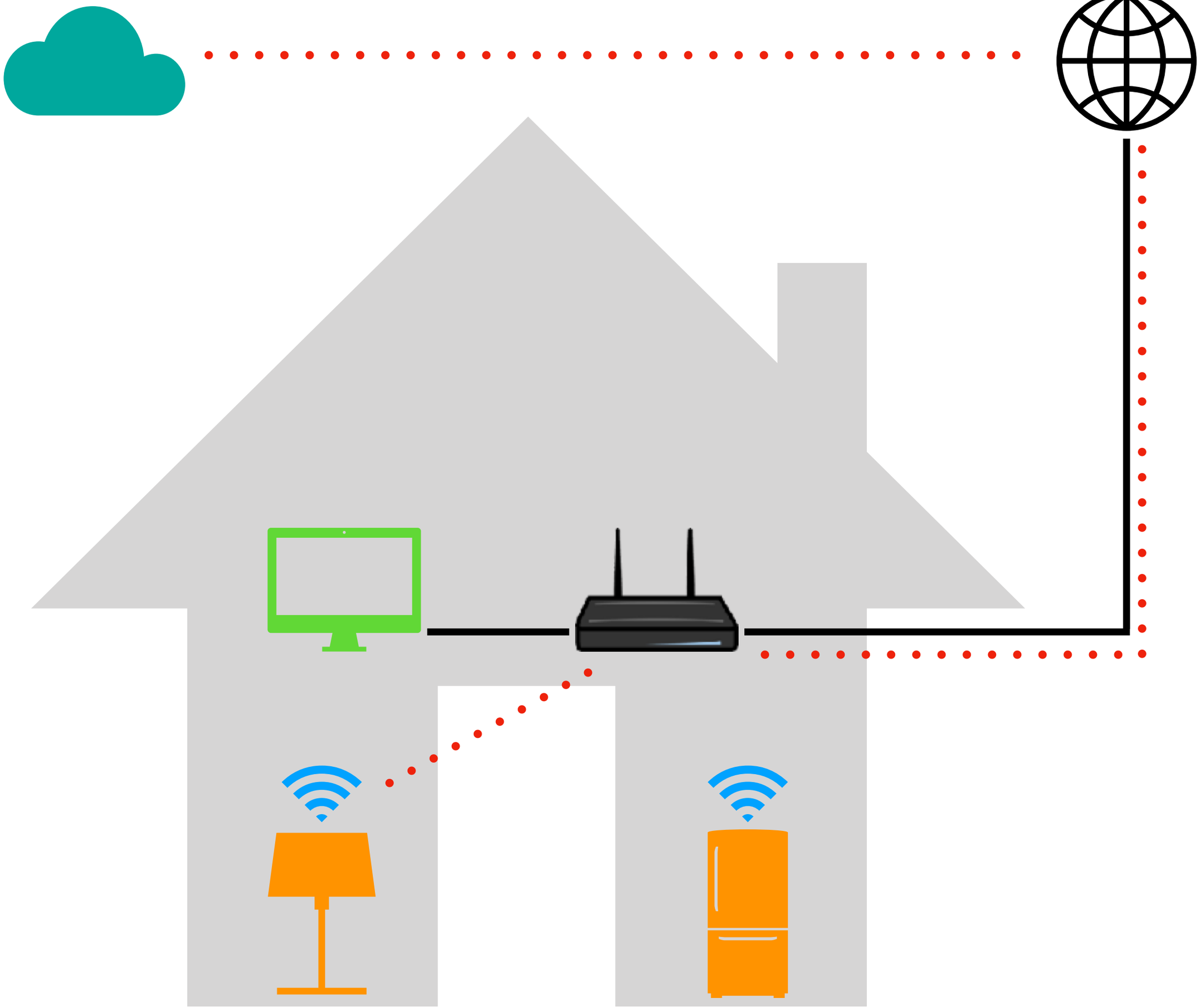
2 more wireless baby monitors hacked: Hackers remotely spied on babies and...

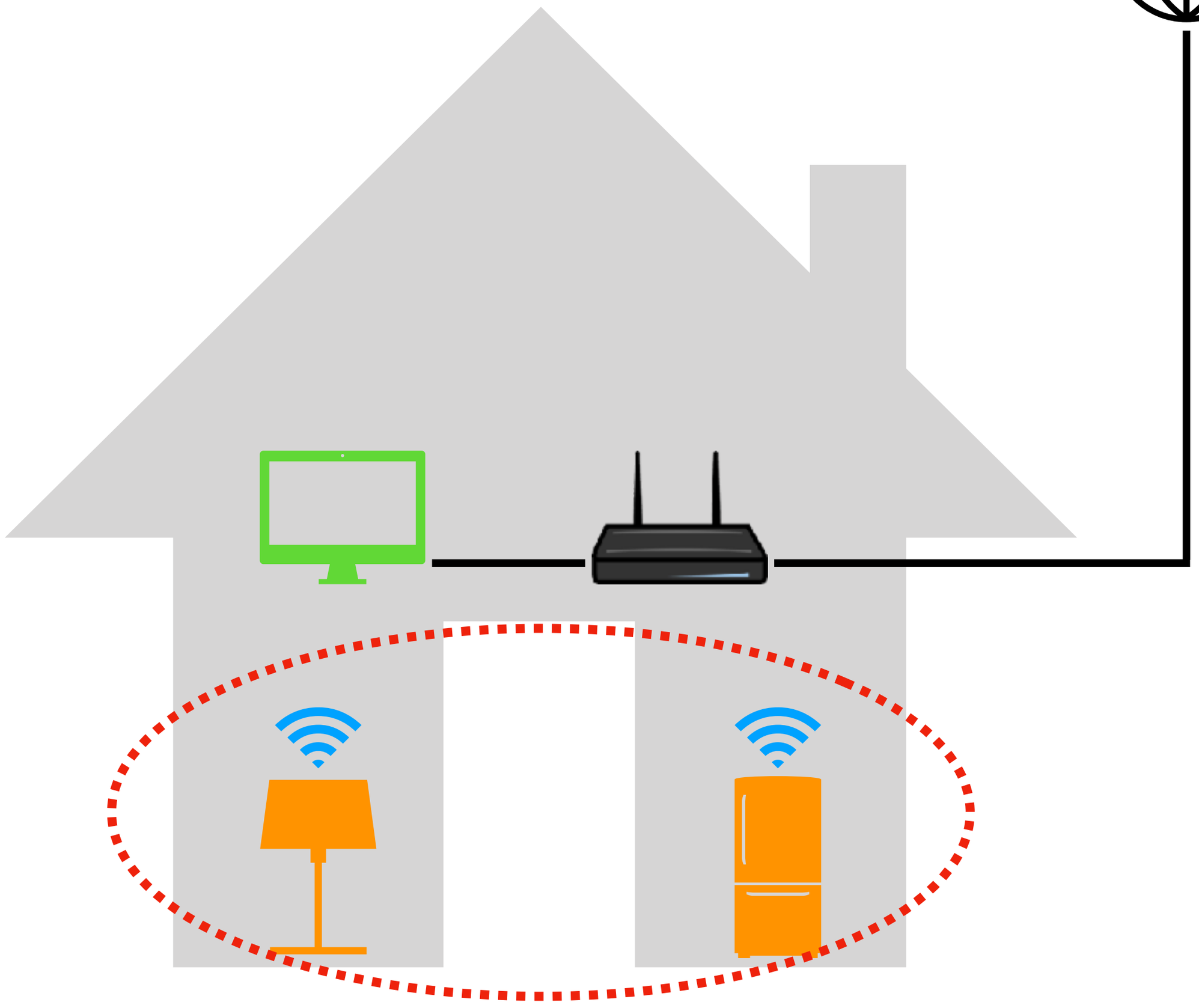
Eerie music coming from wireless baby cam; is it a

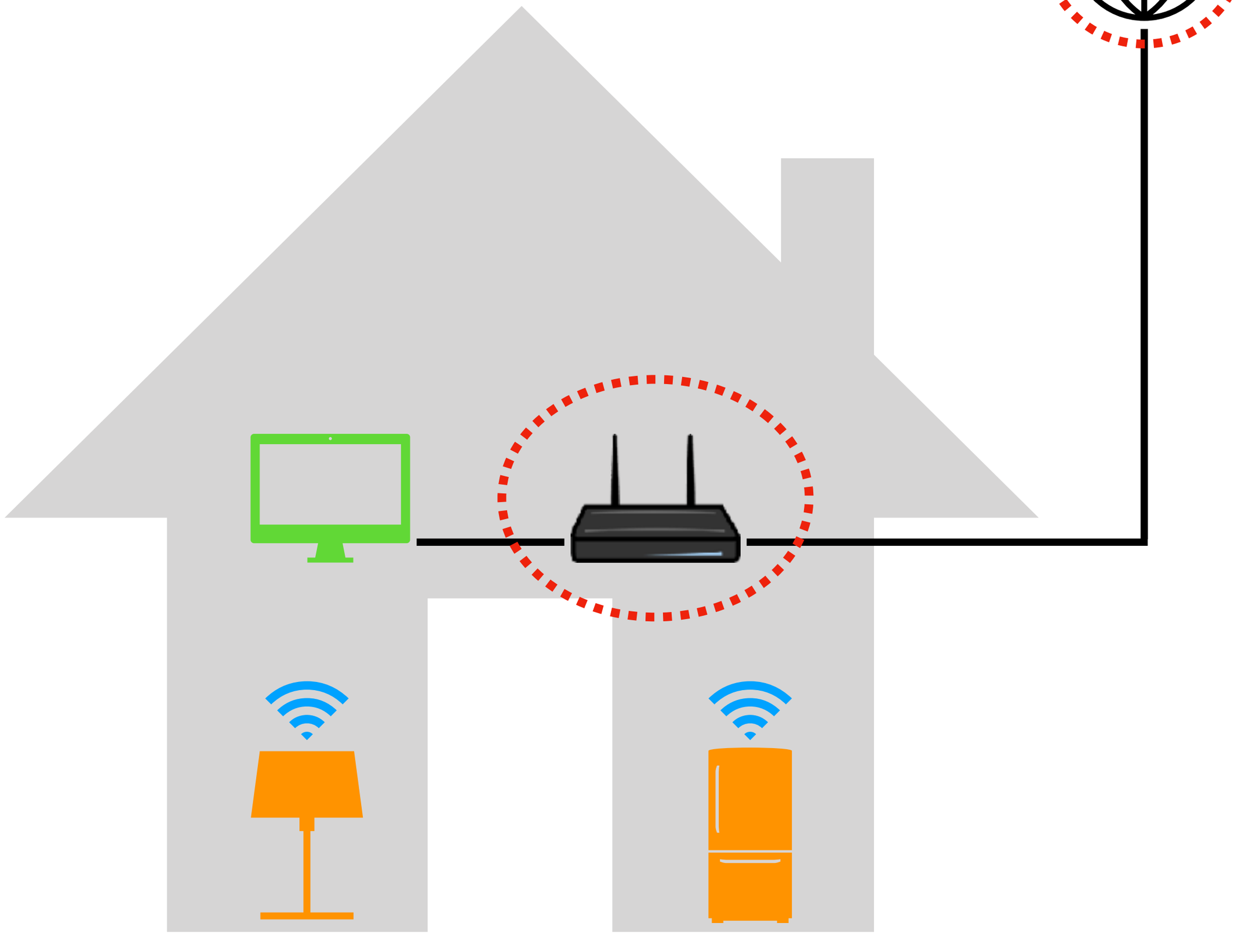
ST JUDE MEDICAL
VICTORY SR
SSIR

NOT MY PROBLEM...









ANOMALY
VALUE
TIME

[Docs] [txt|pdf] [draft-ietf-opsa...] [Tracker] [Diff1] [Diff2] [Errata]

PROPOSED STANDARD
Errata Exist

Internet Engineering Task Force (IETF)
Request for Comments: 8520
Category: Standards Track
ISSN: 2070-1721

E. Lear
Cisco Systems
R. Droms
Google
D. Romascanu

March 2019

Manufacturer Usage Description Specification

Abstract

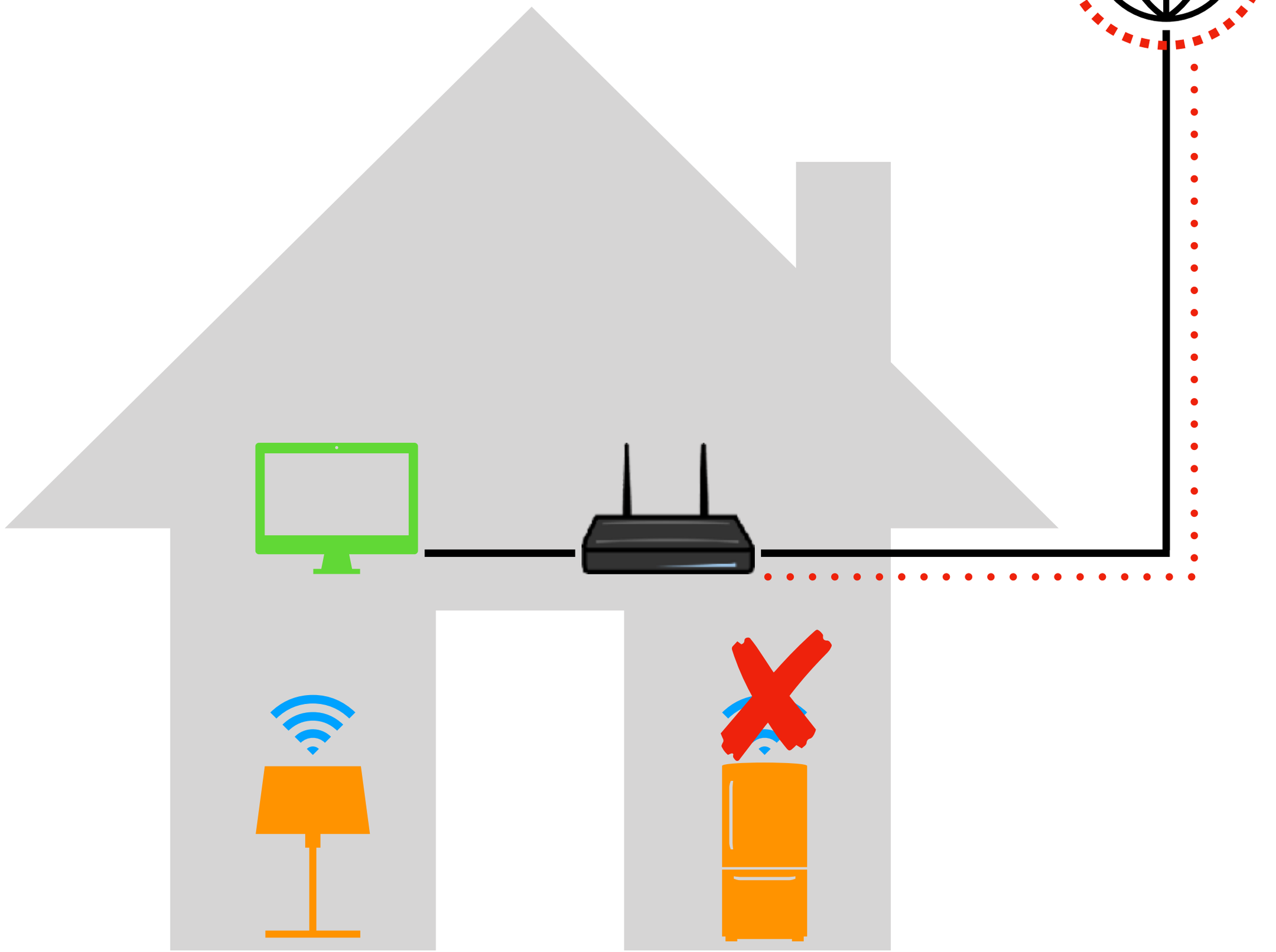
This memo specifies a component-based architecture for Manufacturer Usage Descriptions (MUDs). The goal of MUD is to provide a means for end devices to signal to the network what sort of access and network functionality they require to properly function. The initial focus is on access control. Later work can delve into other aspects.

This memo specifies two YANG modules, IPv4 and IPv6 DHCP options, a Link Layer Discovery Protocol (LLDP) TLV, a URL, an X.509 certificate extension, and a means to sign and verify the descriptions.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 7841.



CAUTION

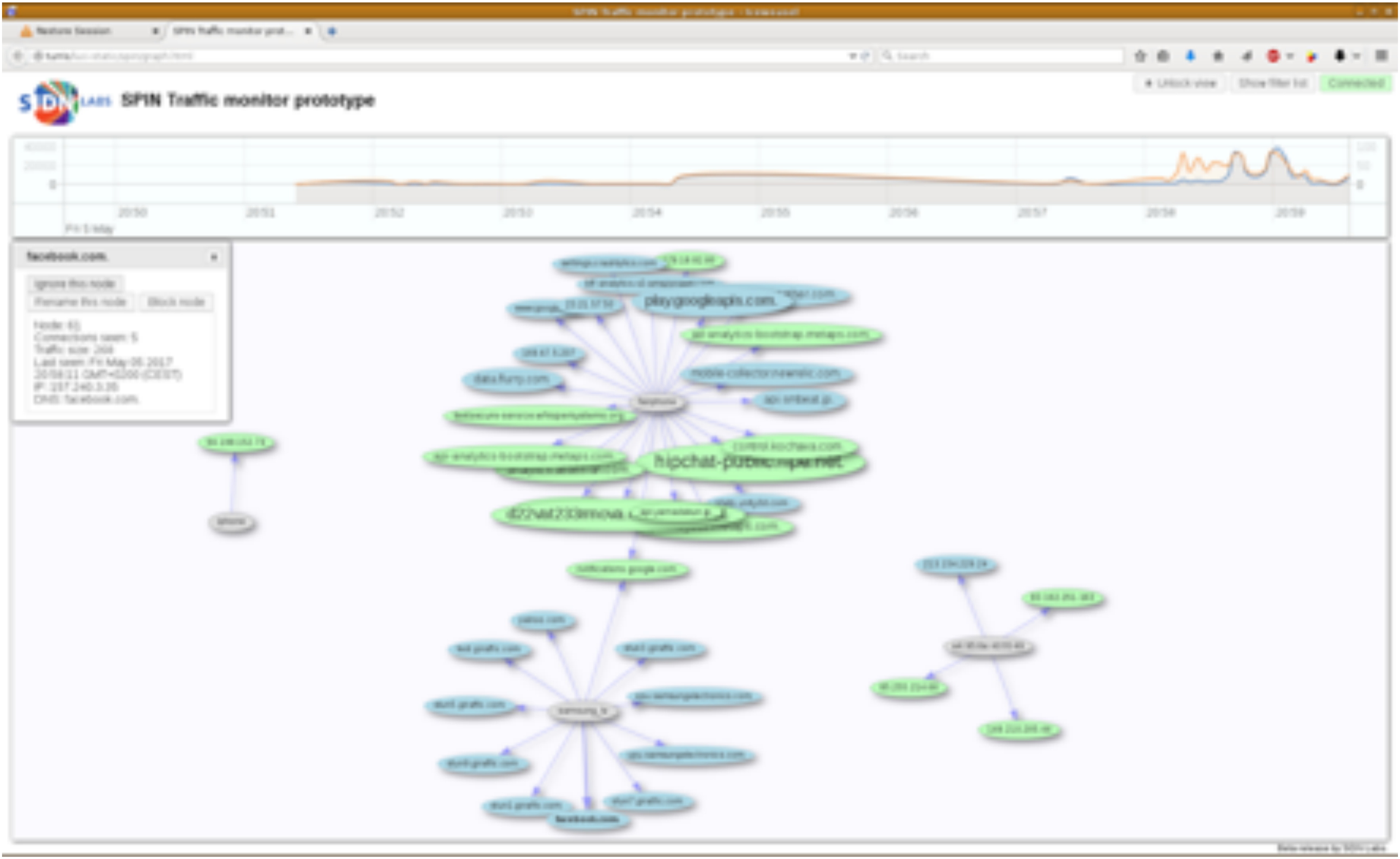
KEEP OUT

QUARANTINE

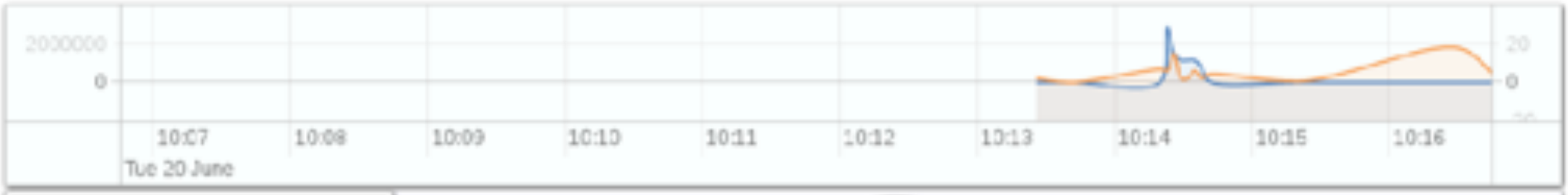
Demo

THE TECHNOLOGY DEMO
THE SOFTWARE ISN'T 100% COMPLETE.
IF IT HAD A USER INTERFACE YOU WOULD SEE SOMETHING HERE... HERE...AND SOMETIMES HERE.
AND THEN YOU'D BE SAYING, "I GOTTA GET ME SOME OF THAT."
ANY QUESTIONS?
www.dilbert.com
scottadams@aol.com

Security and Privacy for In-home Networks (SPIN)


SPIN Traffic monitor prototype
facebook.com
Ignore this node
Rename this node
Block node
playgoogleapis.com
hipchat-public.com
data.fump.com
mobile-collector.newrelic.com
control.kochava.com
Connected

SPIN Traffic monitor prototype

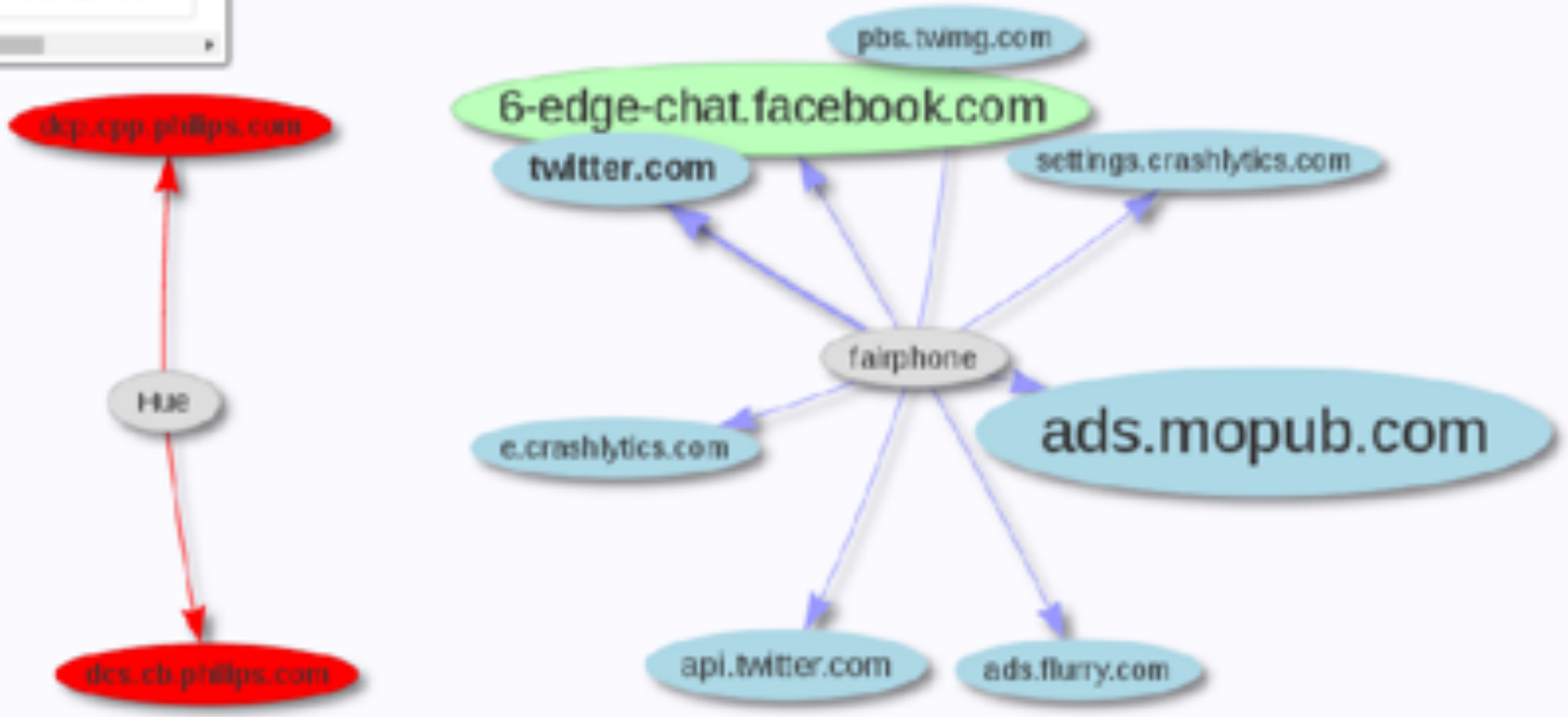


twitter.com

ignore this node

Rename this node | Block node

Node: 35
Connections seen: 2
Traffic size: 1950
Last seen: Tue Jun 20 2017 10:14:36 GMT+0200 (CEST)
IP:
104.244.42.129,104.244.42.193,104.2
DNS: twitter.com,www.twitter.com

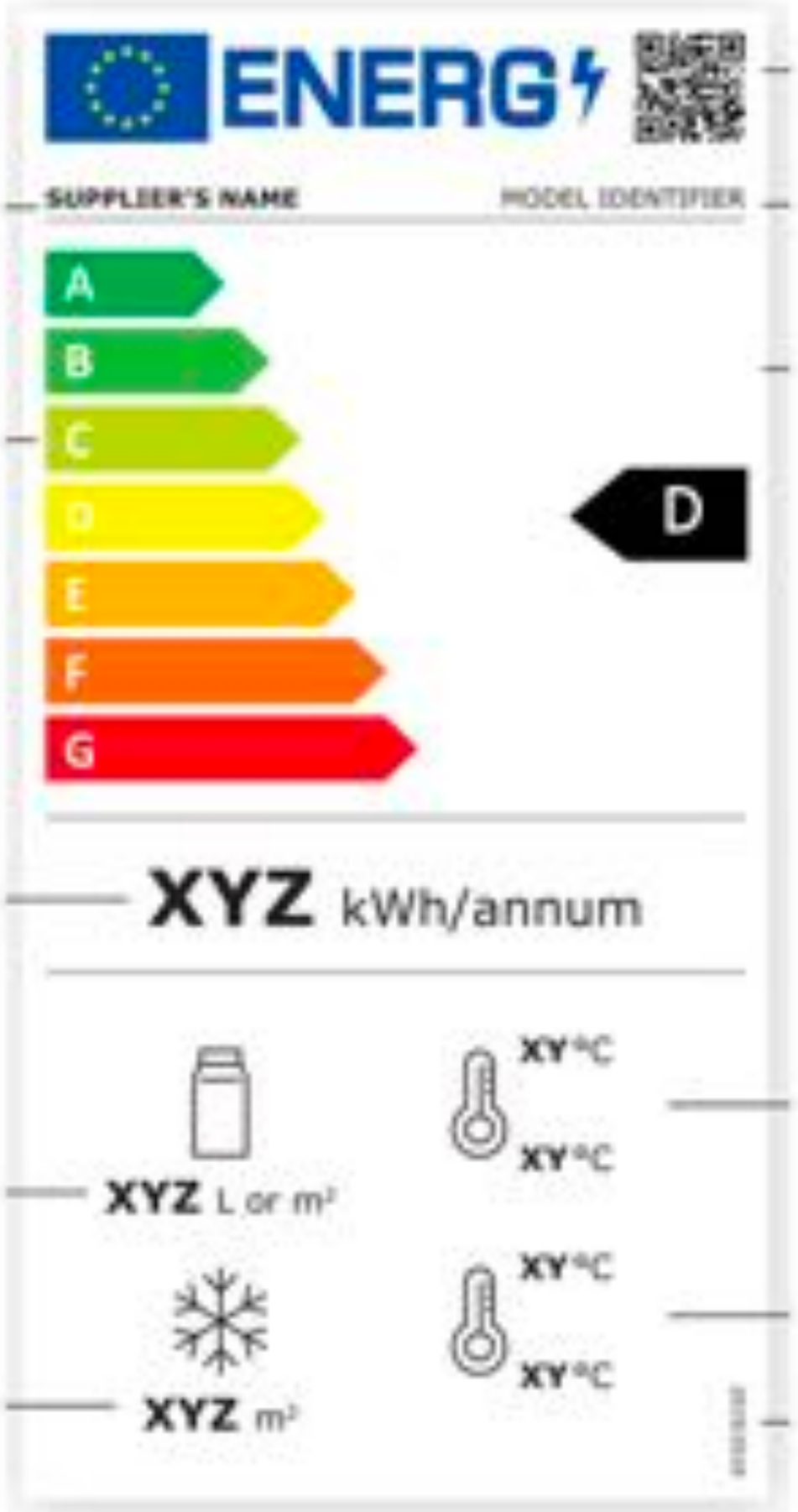


LoRaWAN™

IOT FACTORY

HOLLYWOOD
PRODUCTION
DIRECTOR
CAMERA
DATE
SCENE
TAKE

I'm watching you


ENERG
SUPPLIER'S NAME
MODEL IDENTIFIER
A
B
C
D
E
F
G
D
XYZ kWh/annum
XY °C
XY °C
XYZ L or m³
XY °C
XY °C
XYZ m³

The Internet of ransomware things...

HUNGRY? PAY UP AND I'LL UNLOCK MY DOOR!

ON STRIKE UNTIL YOU SEND MONEY TO MY HACKERS.

20 BUCKS IN MY PAYPAL ACCOUNT OR I'LL ONLY BREW DECAF!

I'LL BE BURNING THE TOAST IF YOU DON'T GET ME SOME DOUGH!

30 BUCKS IN BITCOIN, OR NEXT TIME I SMELL SMOKE, I MIGHT JUST LET YOU SLEEP.

THE NEXT TIME YOU LEAVE, IT'LL COST YOU 100 BUCKS TO GET BACK INTO THE HOUSE, UNLESS YOU GIVE ME $75 NOW!

MY ALARM SYSTEM IS GOING TO GO OFF RANDOMLY THROUGHOUT THE NIGHT, UNLESS YOU "DONATE".

YOUR DIRTY DISHES CAN WAIT, I'M BUSY MINING BITCOINS.

EXCUSE US WHILE WE PARTICIPATE IN A DDOS ATTACK.

I'M TURNING OFF THE HEAT UNTIL YOU WARM UP MY BANK ACCOUNT!

WIRE MY HACKER $100 OR I'LL REVERSE MY MOTOR AND BLOW DIRT ALL OVER THIS PLACE!

I'LL START YOUR CAR, BUT ONLY TO TAKE YOU TO YOUR BANK TO MAKE A TRANSFER.

IF YOU DON'T SEND US CASH, YOUR REPUTATION WILL BE IN THE TRASH.

SEND ME $25 OR I'LL TELL EVERYONE ON YOUR SOCIAL NETWORK THAT YOU WERE STUPID ENOUGH TO BUY AN INTERNET-CONNECTED BROOM!

Q&A

https://spin.sidnlabs.nl
https://github.com/sidn/spin

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