



# IoT and Cybersecurity: Pros and Cons

Presented by: Emyll Almonte

# What is IoT?

- The Internet of Things is a system of interrelated and interconnected computing devices, mechanical and digital machines, or objects that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
- Google Home, NEST, Amazon Echo, Ring Video Doorbell, Facebook Portal, Smart refrigerators, Smart TVs, Sonos Wireless Speakers, and many more...

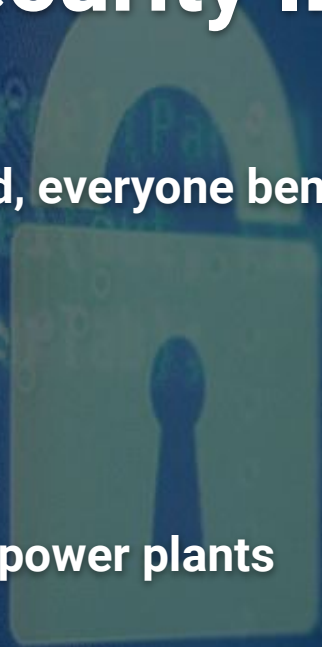
# What is Cybersecurity?

- **Cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. These cyber/digital attacks are usually aimed at accessing, changing, or destroying sensitive information; extorting money from users; or interrupting normal business processes.**
- **Malware, Ransomware, Phishing, Brute-force attacks, Vulnerabilities..**
- **Firewalls, ACLs, Software-based Protection, Up-to-date software...**



# Why is Cybersecurity Important?

- In today's connected world, everyone benefits from cybersecurity
- identity theft
- extortion attempts
- loss of important data
- critical infrastructure like power plants
- hospitals
- financial service companies



# IoT: Pros

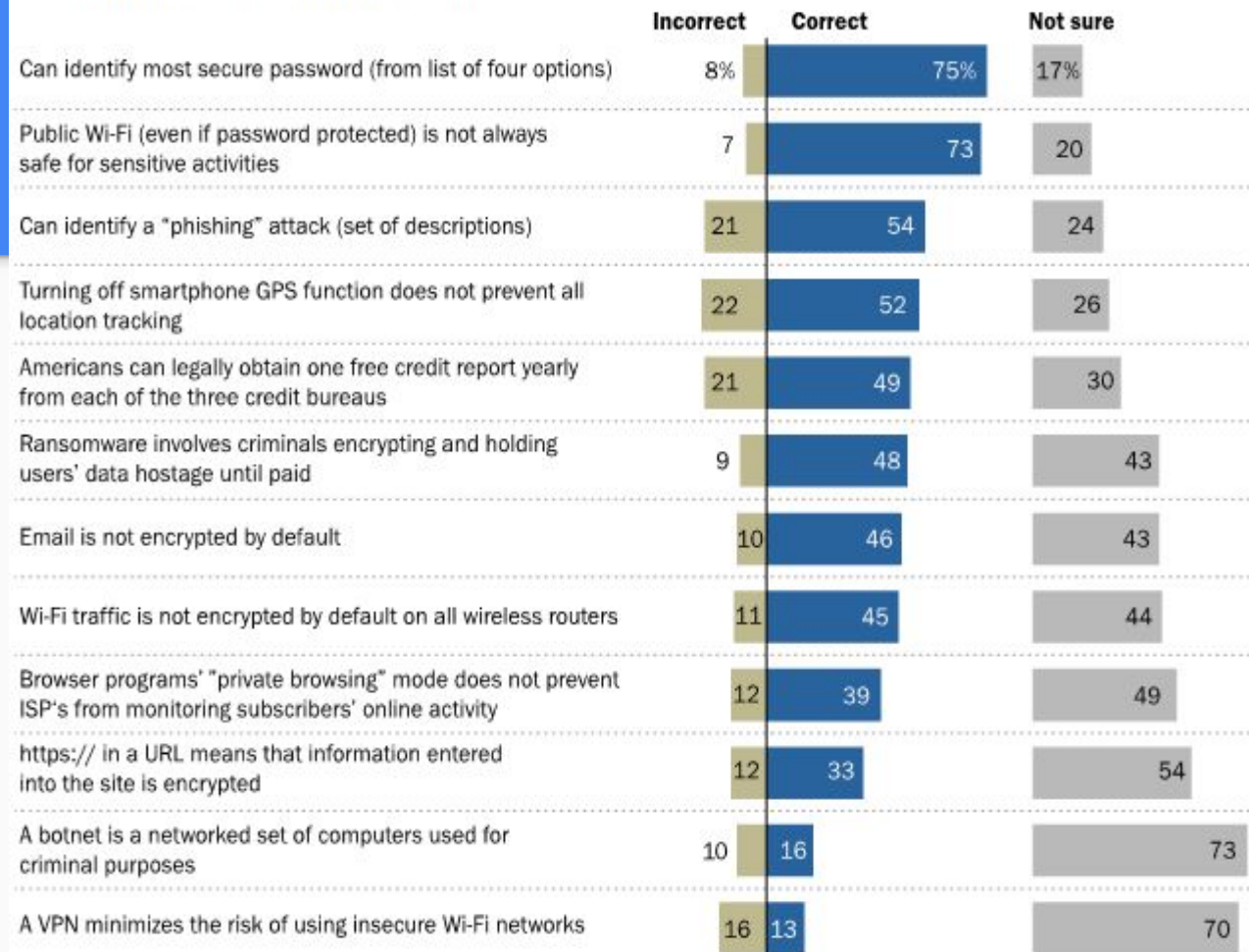
- **Convenience**
  - *Control systems from your smartphone*
  - *Automate tasks in the house*
  - *Get answers to questions in seconds*
- **Cool gadgets**
  - *Smart fridge*
  - *Smart bulbs*
  - *Motion sensor activated video doorbell*
  - *Health trackers*
  - *Smart thermostats*

# The problem

The average IoT device and computer user in general has very basic knowledge and understanding of cybersecurity and how networks function overall.

## Many Americans are unsure on a range of cybersecurity topics

% of internet users answering each question ...





Cons:  
More serious  
problems...

## The search engine for the Internet of Things

Shodan is the world's first search engine for Internet-connected devices.

Create a Free Account

Getting Started

**CHECK-HOST**

IP: 74.105.165.28 Country: United States of America (New Jersey, Newark)

14.63.167.192

Info Ping HTTP TCP port UDP port DNS

**IP and website location: 14.63.167.192**

DB-IP (01.10.2019)	
IP address	14.63.167.192
Host name	14.63.167.192
IP range	14.63.22.0-14.72.210.255 CIDR
ISP	Korea Telecom
Organization	Kornet
Country	Korea, The Republic of (KR)
Region	Gyeonggi-do
City	Seongnam-si (Buljeong-ro)
Time zone	Asia/Seoul, GMT+0900
Local time	14:10:35 (KST) / 2019.10.09
Postal Code	13606

Leaflet | © OpenStreetMap contributors

```
Oct 09 00:12:11 ip-172-31-16-216.us-east-2.compute.internal sshd[8395]: Invalid user Isabella@2017 from 51.38.98.23 port 47594
Oct 09 00:14:00 ip-172-31-16-216.us-east-2.compute.internal sshd[8420]: Invalid user 123 from 159.65.30.66 port 59714
Shodan Developers Monitor View All...
Oct 09 00:37:57 ip-172-31-16-216.us-east-2.compute.internal sshd[12706]: Invalid user USA@2018 from 14.63.167.192 port 46498
Oct 09 00:39:27 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Willkommen-123 from 159.65.30.66 port 51168
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user P@$$word2020 from 45.77.137.186 port 41455
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123Dex from 14.63.167.192 port 57384
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Infinity123 from 159.65.30.66 port 33818
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user PA$$WORD@123 from 45.77.137.186 port 60833
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Toys123 from 159.65.30.66 port 46496
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Press@2017 from 14.63.167.192 port 40048
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user PA$$WORD@123 from 45.77.137.186 port 51972
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123 from 159.65.137.23 port 34348
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Null12017 from 159.65.30.66 port 55572
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user lqw23er4 from 14.63.167.192 port 50922
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Nullen@1233 from 45.77.137.186 port 43101
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Tel@123 from 159.65.137.23 port 56658
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Pass@2017 from 159.65.30.66 port 38222
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user lqw23er4 from 14.63.167.192 port 33572
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123Chain from 45.77.137.186 port 34245
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user West@2017 from 159.65.137.23 port 49982
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user LouLou@123 from 159.65.30.66 port 49100
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Xsw21qaz from 14.63.167.192 port 44452
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Admin@20 from 45.77.137.186 port 53605
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Cannes_123 from 159.65.30.66 port 59982
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user P@55w0rd@2015 from 159.65.137.23 port 43294
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Antoine-123 from 45.77.137.186 port 44736
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user Psyche_123 from 14.63.167.192 port 55354
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123Premium from 159.65.30.66 port 42628
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123Winter from 159.65.137.23 port 36828
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user StgbNHV^7uJm from 45.77.137.186 port 35881
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user P@SSWORD2020 from 14.63.167.192 port 38004
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user P4SSWORD@2020 from 159.65.30.66 port 53504
Oct 09 00:40:00 ip-172-31-16-216.us-east-2.compute.internal sshd[14714]: Invalid user 123lobster from 159.65.137.23 port 58764
[root@ip-172-31-16-216 conf]#
```

Cons:  
continued..

NT10e

STATUS

LOGIN

Thermostat Status

Downstairs

10/9/2019, 9:37:35 PM

Temperature

Zone Temperature	65.7°F	
Override		
Cool Setting	98.0°F	
Heat Setting	55.0°F	
Hold Mode	Off	

Schedule Settings

Day Class / Period	Away / Eve	
Cool	98.0°F	
Heat	55.0°F	

HVAC Settings

HVAC State	Off	
HVAC Mode	Auto	
Fan State	Off	
Fan Mode	Auto	

Alarm Status

Low Temperature	OK	
High Temperature	OK	
Filter change	OK	

Refresh

Not Secure | 24.45.152.251:8081

Accounts News Education Shopping Other Enlightenment IT Stuff Learning

NT10e

STATUS

LOGIN

Sign in

http://24.45.152.251:8081

Your connection to this site is not private

Username

Password

Cancel Sign In

Downstairs

10/9/2019, 9:37:35 PM

### Schedule Settings

Day Class / Period	Away / Eve
Cool	98.0°F
Heat	55.0°F

### HVAC Settings

HVAC State	Off
HVAC Mode	Auto
Fan State	Off
Fan Mode	Auto

TOTAL RESULTS

106

TOP COUNTRIES



United States	65
United Kingdom	9
Netherlands	7
France	6
Germany	6

TOP SERVICES

8081	49
1883	20
8083	13
HTTPS	12

New Service: Keep track of what you have connected to the Internet. Check out [Shodan Monitor](#)

24.45.152.251

ool-182d98fb.dyn.optonline.net  
Optimum Online  
Added on 2019-10-10 00:10:41 GMT  
United States, Patchogue

HTTP/1.1 200 OK  
Cache-control: no-cache  
Connection: close  
Server: Ubicom/1.1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<title>Thermostat Downstairs - Status & Control</title>
<!-- <link rel="stylesheet" type="text/css" href="styles.css" -->
<style ty...
```

74.70.56.161

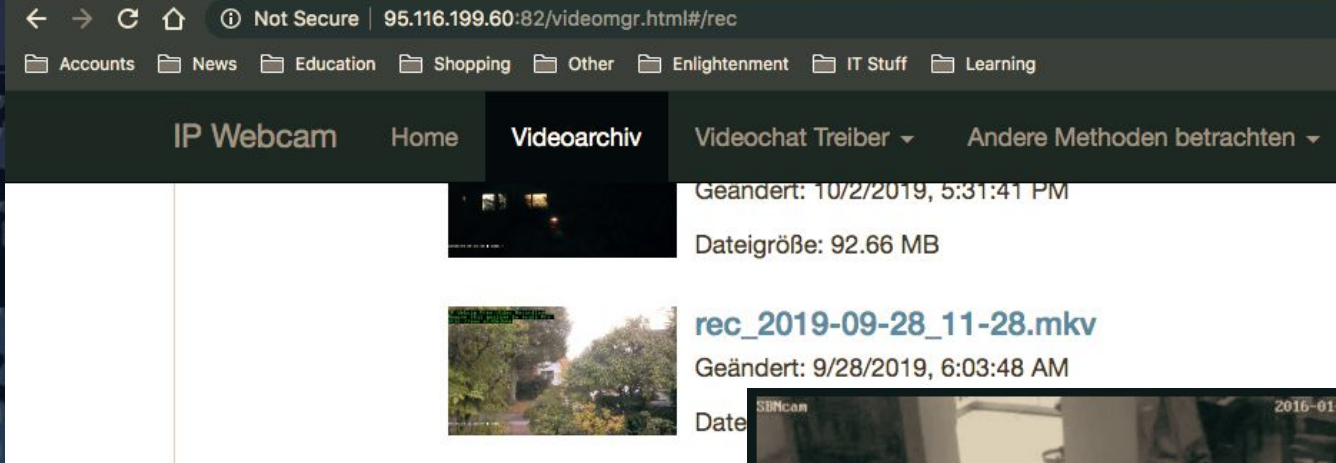
gpe-74-70-56-161.ny.csp.res.m.com  
Spectrum  
Added on 2019-10-09 18:16:51 GMT  
United States, Albany

HTTP/1.1 200 OK  
Cache-control: no-cache  
Connection: close  
Server: Ubicom/1.1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
```



Cons:  
Not good...

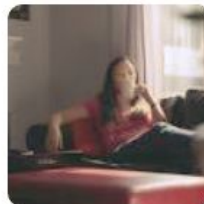


BI Business Insider

## A couple says that Amazon's Alexa recorded a private conversation and randomly sent it to a friend

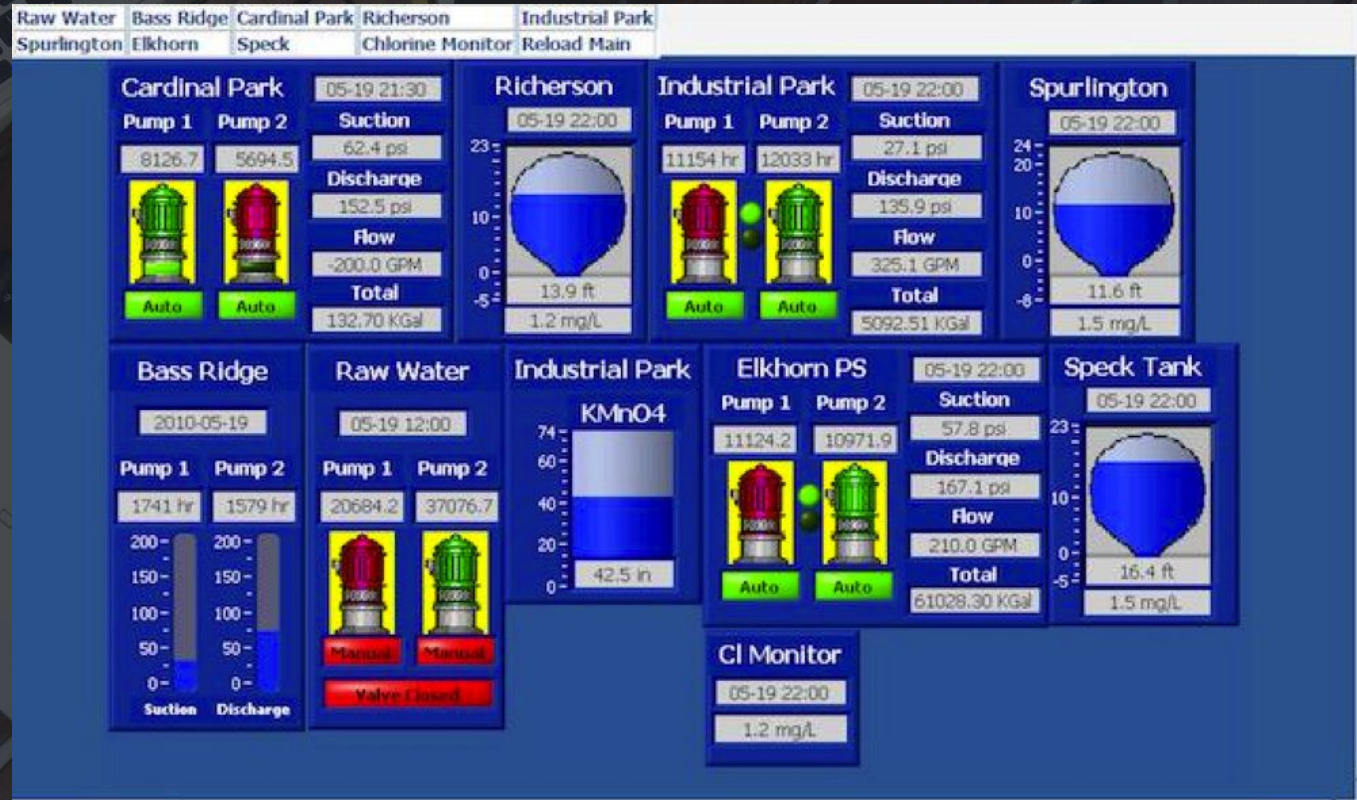
A couple in Portland, Oregon, said the Amazon Alexa-powered devices in ... conversation and sent the recording to a person in their contacts. ... "Echo woke up due to a word in background conversation sounding like 'Alexa."

May 24, 2018



Cons:  
Very bad...

...life and death  
situations...  
hospitals...  
explosions..  
changing kids  
thermostat to very  
high temperature...





Solution:

Try an IT Project Management approach for an IoT home..



# IoT Project Management:

Get expert help if possible..

Remember privacy vs convenience..

Read as much as possible about IoT device and network security..

*"An ounce of prevention is worth a pound of cure.."*

Gather data on IoT devices you would like..

Design/Plan security..

Execute the plan..

# IoT and Cybersecurity is the future...

Internet of Things is here to stay, and it will just get bigger with time.. Homes will incorporate smart devices by default... 500 Billion of IoT devices by 2030 (*Cisco*).. Cybersecurity is, and will always be, extremely important in our daily lives because of everything we will be interacting with..

