2018 IoT Security Trends

A bit about us

Tondo smart **is a pioneering and Fast Growing connected lighting solution provider.**

- With More than 20 years experience in lighting and Over 7 years experience in IoT.

- Offices in Tel-Aviv & Boston
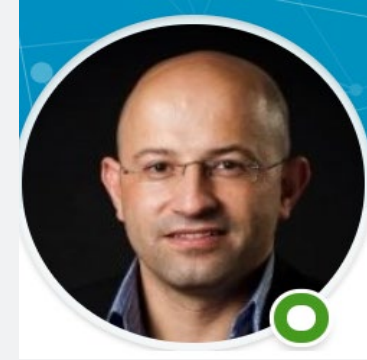
Eliav Gnessin

An expert in the space of Mobile Internet technology and IoT with 15+ years' experience in the industry. I specialize in the discipline of sophisticated software systems design and architecture.

Currently, I am the CTO of Cloud of Things and Tondo, where I help transform the IoT vision into reality.

Specialties: Software and hardware architecture, Sizing of large scale systems, Embedded systems, IoT and IoT standards, DevOps, Docker, Python, Predictive Algorithms, AI

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tondo

ENLIGHTENING CONNECTIVITY

Session Goals:

- Understand IoT security better
- IoT security challenges
- Current trends in IoT security
- Tondo as a secure IoT implementation

IoT Definition

- Where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers
- Allowing devices to generate, exchange and consume data with minimal human intervention
- There is, however, no single, universal definition.

- Better definition: Small computers with sensors running applications!

- Smart lights, remote cameras, temperature sensors, thermostats, plugs, locks, security systems, hubs, toothbrushes, toasters, pet feeders, top brewers, heart rate monitors, smart cars, blenders, washing machines, holiday light controls, well monitors, pacemakers, toasters, and

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An IoT example

IoT Protocols

- Device-to-device
- Device-to-cloud
- Device-to-gateway-to-cloud
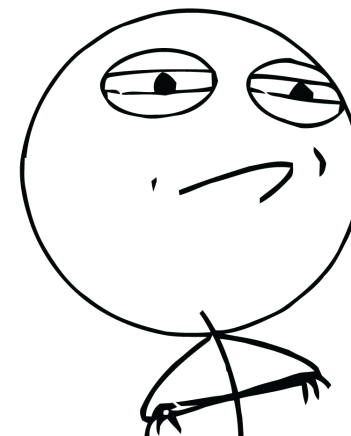- Back-end data sharing

IoT Connectivity Models

- **BLE**
- **Wi-Fi**
- **LoRa**
- **Z-Wave**
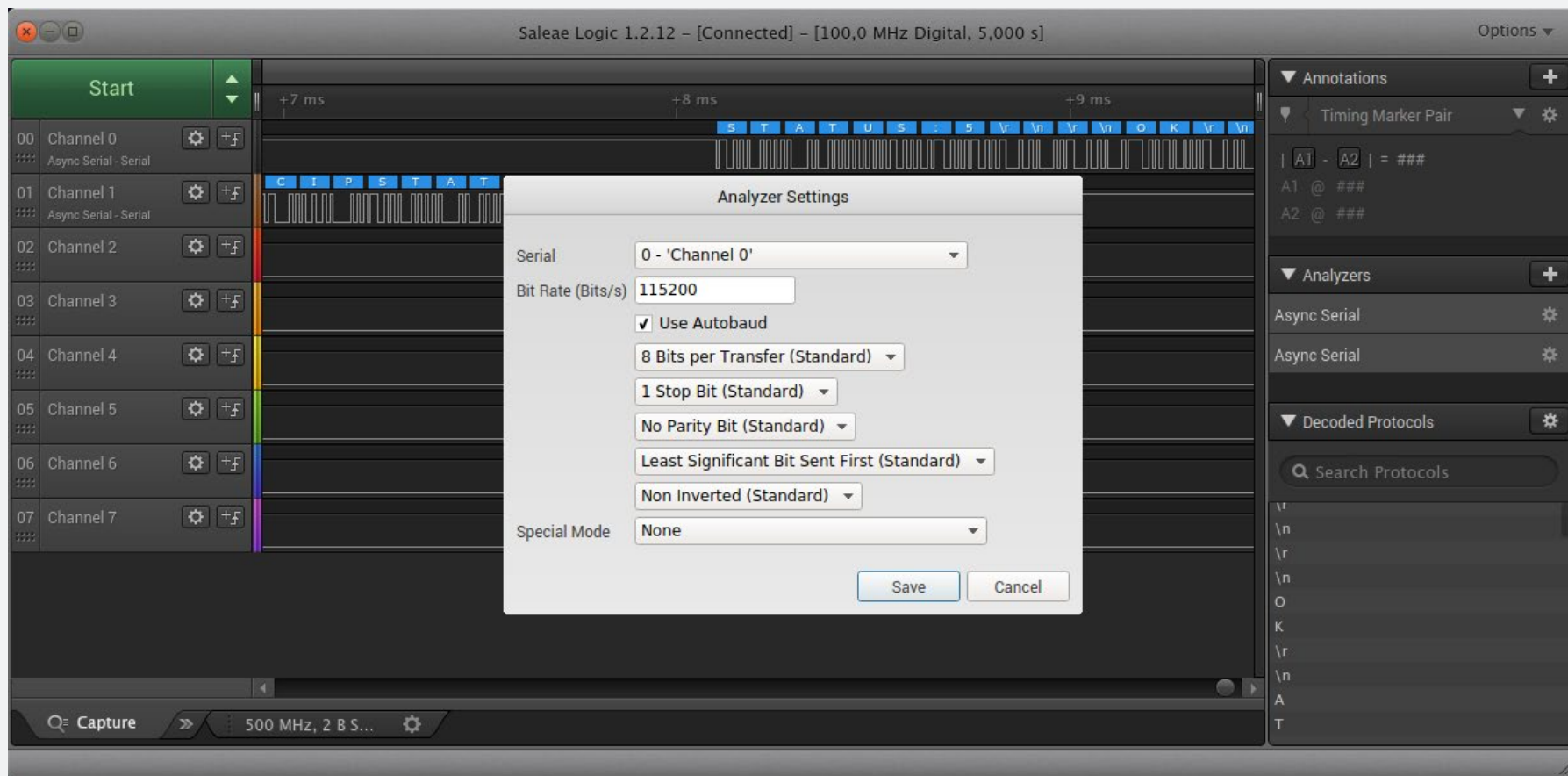- **Zigbee**
- **NB-IOT**
- **CAT-M1**

Challenges of IoT Security

- Physical access
- Many edge devices are single purpose
- Many devices not designed to be updated
- Devices are resource constrained
- Traditional manufacturers...
  - Knowhow
  - Competence

CHALLENGE ACCEPTED

Real devices are not Raspberry Pis…

- MCUs are sometimes 8-bit constrained
  - 32KB NVRAM, 32KB RAM is common
- Example of a more modern constained MCU – SAMD21
  - (put details of SAMD21)

What do tech giants do for devices?

Split the IoT world into two types of devices

Constrained
- Google – JWT based, Microchip/Atmel ECC608A
- Microsoft – Azure IoT Sphere
- Amazon - FreeRTOS
- Other approaches – many (Zephyr, Apache mynewt)

Strong enough "can run Linux"
- Google – Android Things, resin.io, TensorFlow
- Microsoft – Azure IoT Edge, AI Toolkit
- Amazon – Gateway SDK, Greengrass
- Other approaches – many

Tondo's solution

Smart Lighting Control modules that work with any fixture

• Any driver – DALI, 0-10V, 1-10V, On/Off

• Any interface – ANSI 136.10, ANSI 136.41, Zhaga, Direct Connect

• Communications flexibility – NB-IOT, CAT-M1, LoRa Mesh, LoRaWAN, Wi-Fi

Sensors that turn any fixture into a smart city node

• • Environmental monitoring

• • Auxiliary/Holiday light control

• • Traffic monitoring

Integrated software for easy deployment and operation

• Mobile commissioning and support app empowers the field

• Connected lighting management dashboard puts you in control

• Central platform as a service makes is simple and secure

tondo **smart city**
END-TO-END SOLUTION

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IoT Security architecture

- The system provides security layers by design
- Each connected product will include security
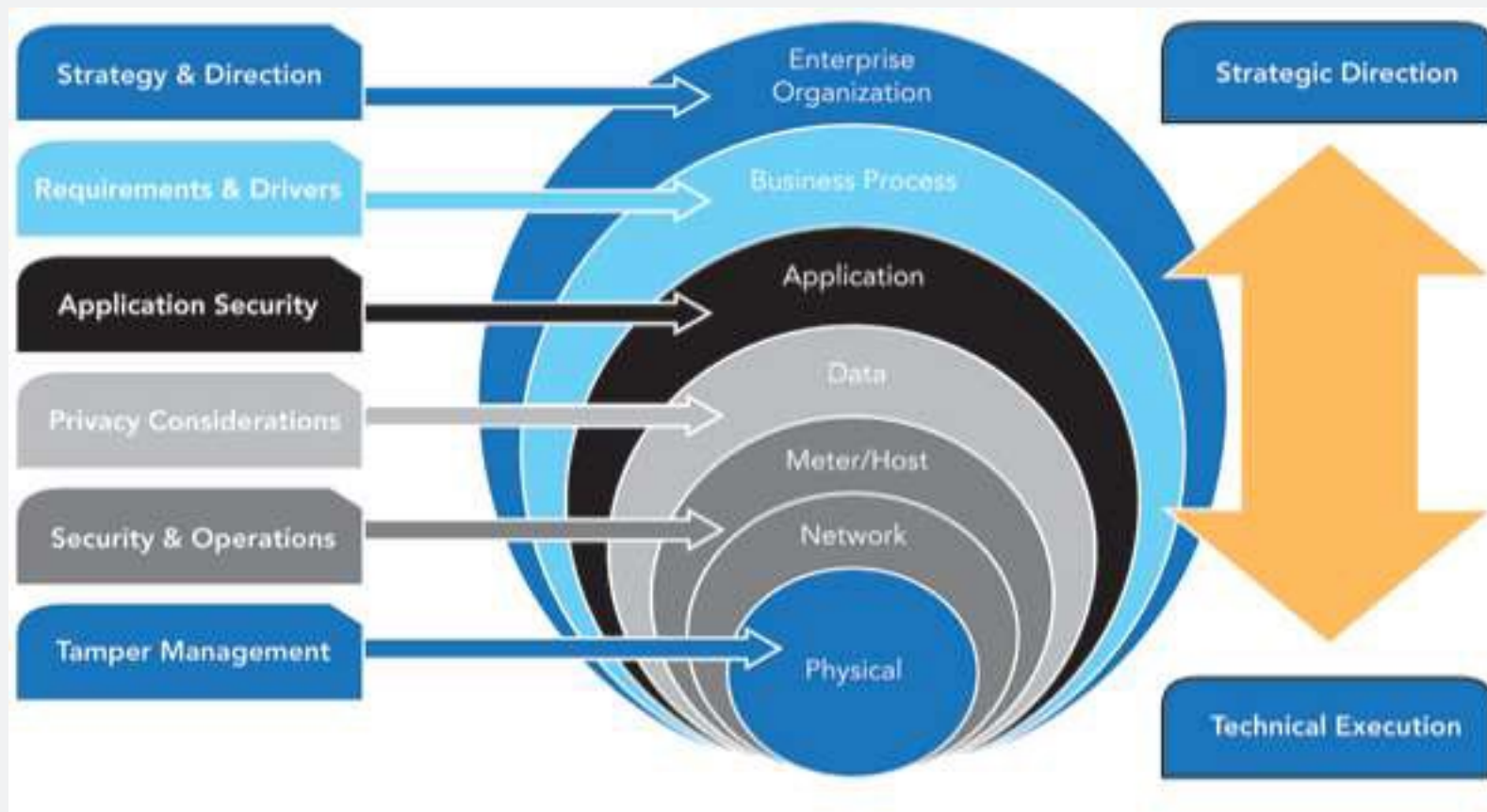
Tondo's implementation

- **Cloud**
  - DeviceTone secure model
- **Mobile app**
  - Use industry standard best practices
- **Device**
  - **Gateway**
    - DeviceTone Edge
    - Industry standard models for Embeeded Linux
  - **Device**
    - DeviceTone Nano
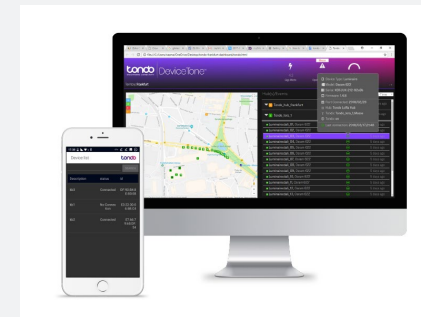   - Use constrained
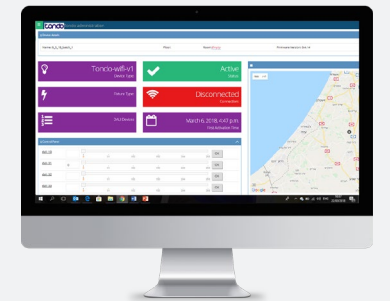   - Atmel ECC608A chip
    - JWT

Tondo's components

Smart lighting controller

Lora Gateway

CMS Dashboard
Technician App

Device management

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Conclusions!

- It's a **jungle** out there
- Build your threat model
- There is no "industry standard" solution yet
- Better not to build IoT security yourself
- DeviceTone approach = vendor agnostic
- Tondo = security first solution