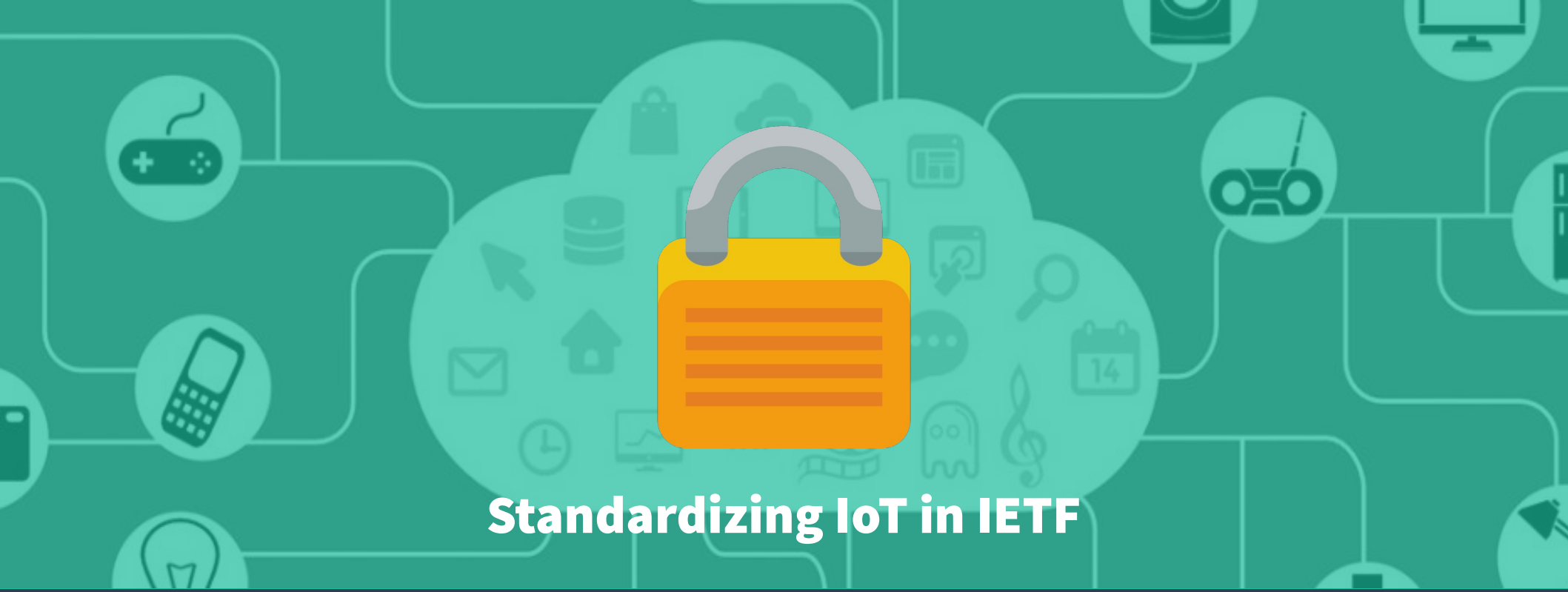


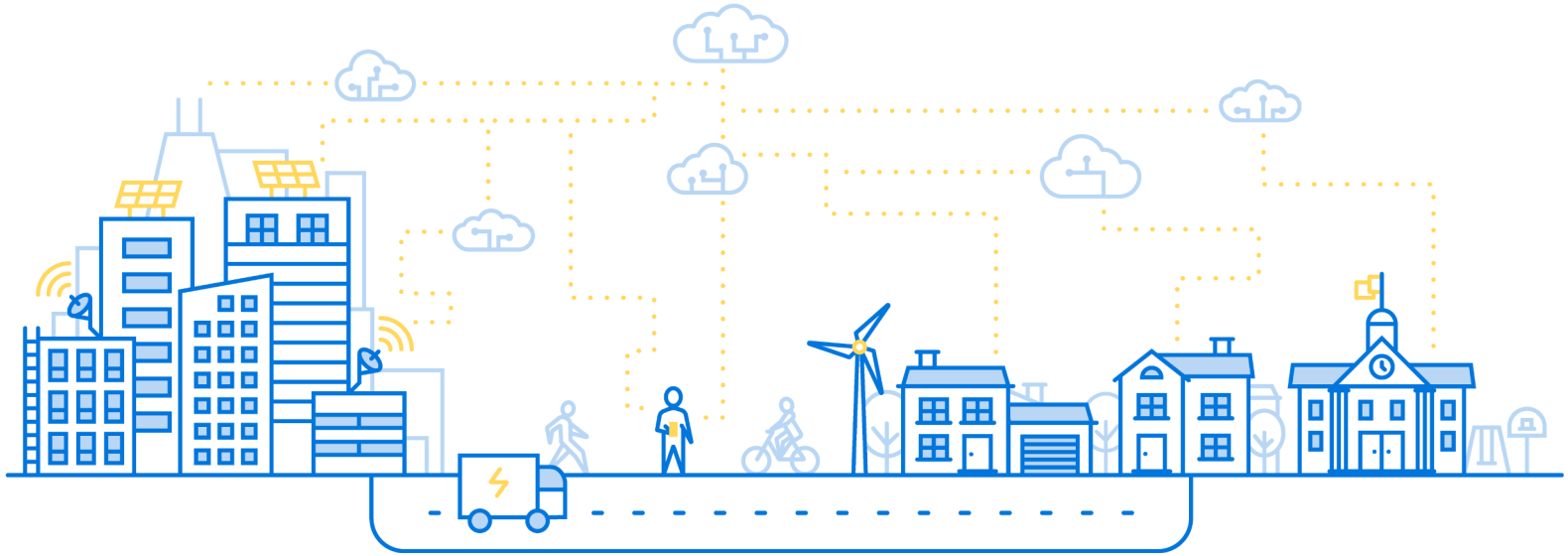
Standardizing IoT in IETF

João Moreno Rodrigues Falcão – Red Team Analyst
Intelliway Technologia
joao.falcao@intelliway.com.br
LACNIC Technical Forum - LACNIC37

About Me

- **Red Team Analyst in Intelliway Tecnologia;**
  - Focusing in IoT and OT;
- **Electrical Engineering Student;**
  - Universidade Federal de Minas Gerais;
- **Researcher at INSCRYPT Laboratory;**
  - Researches Electronic voting systems;
- **Vice Chair at *Youth Standing Group* of ISOC;**
- **Participant IoTCiberSecLAC;**
- **Participant of *Dynamic Coalition on Internet Standards, Security and Safety* (DC-ISSS) of *Internet Governance Forum* (IGF).**

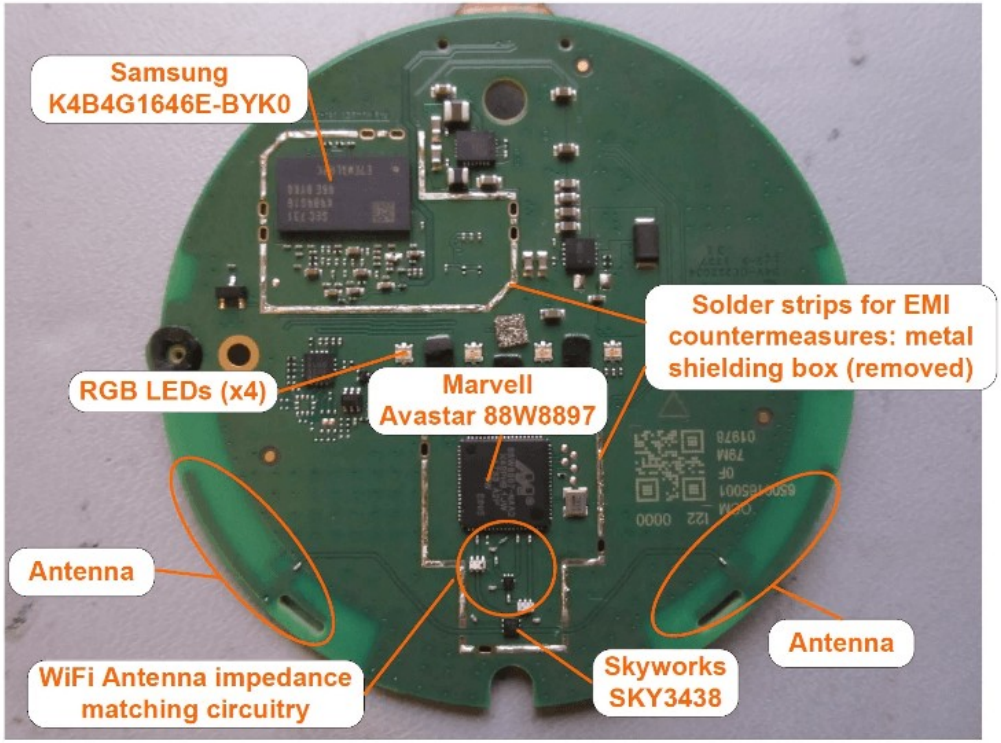
What is IoT?



- “The Internet of things describes physical objects that connect and exchange data with other devices and systems over the Internet.” Wikipedia

Limits of IoT Devices

- Reduced processing;
- Reduced memory;
- Limited energy consumption;
- Autonomous Operation;
- Difficult updates;
- Mobility;
- Integration;
- Various topologies.

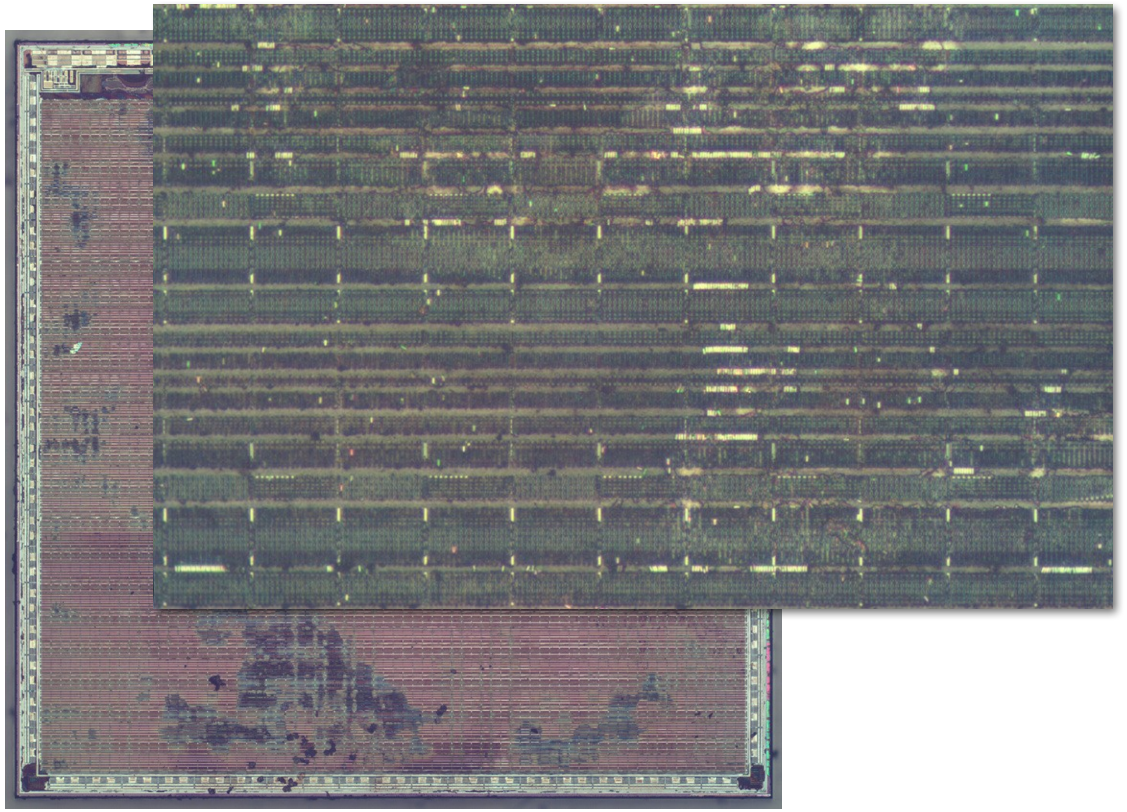


Safe Systems Requirements

- **Confidentiality;**
  - Encryption;
  - Authentication;
  - Anonymization;
- **Integrity;**
  - Digital signatures;
  - Verification sum.
- **Availability;**
  - Attack resistance;

Cryptography and Hardware Acceleration

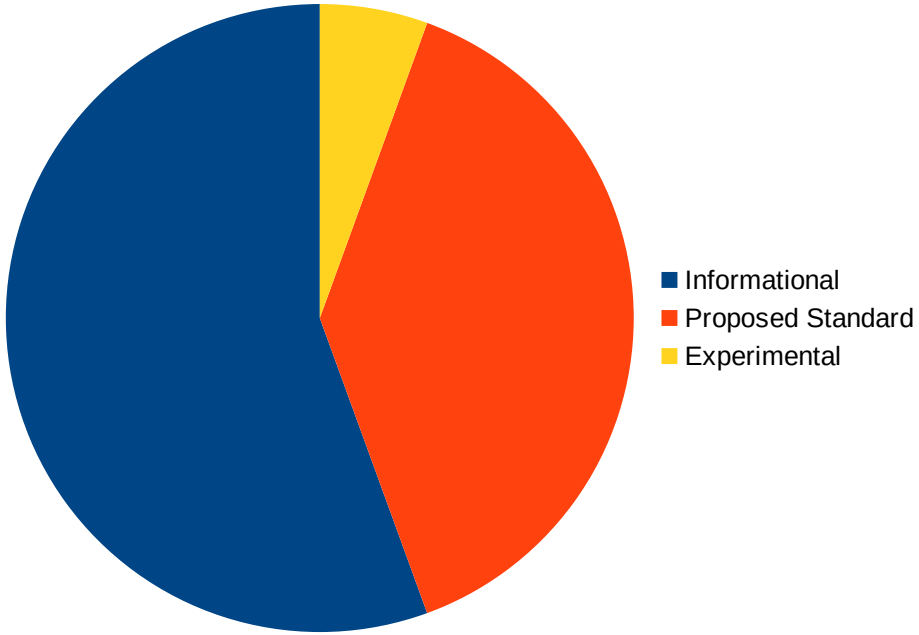
- Energy efficient;
- Multitasking;
- Key Management;



ZeptoLabs - Bitfury

Created RFCs

- RFC 7925: Transport Layer Security (TLS) / Datagram Transport Layer Security (DTLS) Profiles for the Internet of Things
- RFC 8105: Transmission of IPv6 Packets over Digital Enhanced Cordless Telecommunications (DECT) Ultra Low Energy (ULE)
- RFC 8628: OAuth 2.0 Device Authorization Grant
- RFC 9011: Static Context Header Compression and Fragmentation (SCHC) over LoRaWAN
- RFC 9100: Sensor Measurement Lists (SenML) Features and Versions
- RFC 9139: Information-Centric Networking (ICN) Adaptation to Low-Power Wireless Personal Area Networks (LoWPANs)
- RFC 9140: Nimble Out-of-Band Authentication for EAP (EAP-NOOB)
- RFC 9176: Constrained RESTful Environments (CoRE) Resource Directory



What was dicussed at IETF 113

- IoTSF ManuSecured SUIB: Browsing local web resources, in a secure usable manner: Examining IoT device configuration as a special case
- Virtualization of PLC in Industrial Networks - Problem Statement
- Future-Proof Zoning for OT Networks
- Low Latency, Reliable, and Secure Communication for Energy Grid Operations
- TLS/DTLS 1.3 Profiles for the Internet of Things
- Initial Discussion about IoTOPS WG Deliverables

Active Drafts

- draft-birkholz-rats-suit-claims-03: Trustworthiness Vectors for the Software Updates of Internet of Things (SUIT) Workflow Model: The Need for New Authentication Methods for Internet of Things;
- draft-hsothers-iotsens-ps-01: A Concise Binary Object Representation (CBOR)-based Serialization Format for the Software Updates for Internet of Things (SUIT) Manifest;
- draft-ietf-suit-manifest-17: Update Management Extensions for Software Updates for Internet of Things (SUIT) Manifests;
- draft-ietf-suit-update-management-00: TLS/DTLS 1.3 Profiles for the Internet of Things;
- draft-ietf-uta-tls13-iot-profile-04 draft-morais-iotops-inxu-00: Intra-Network eXposure analyzer Utility Specification.

Participate!

IoT
Ciberseguridad
América Latina y el Caribe

- Somos un grupo multidisciplinário latinoamericano y caribeño, creado para promover, difundir y implementar la tecnologia IoT desde las normas hasta las buenas práticas internacionales.

IoTCiberSecLAC
IoTCiberSecLAC
www.iotcs.lat

Obrigado! ¡Gracias! Thank You!
Perguntas?

IoTCiberSecLAC
IoTCiberSecLAC
IoTCiberSecLAC
www.iotcs.lat

João Moreno Rodrigues Falcão
Joao.falcao@intelliway.com.br
joaomorenorf

Bibliografia

- Security Challenges and Limitations in IoT Environments;
- IoT Network Layer Protocols;
- Cybersecurity and the Internet of Things;
- What Is IoT Cybersecurity?;
- Internet de las cosas;
- Grupo de Trabajo de Ingeniería de Internet;
- Bitfury Bitcoin Mining.

12