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internet
made in france

IGF – June 27th 2025

Securing IoT for the Post-Quantum era: A domain name registry perspective

- Sandoche BALAKRICHENAN

Multi-Stakeholder in the Internet - works well

1. Naming Conventions

IETF is the SDO

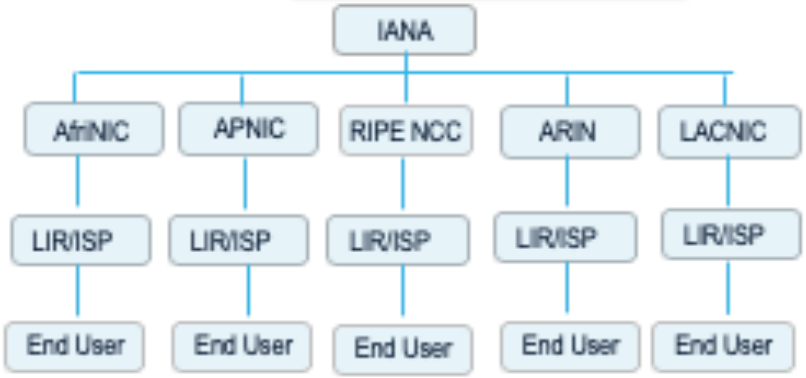
- **Domain names, URI**
- **IP Addresses (IPv4/IPv6)**

2. Provisioning

2.1. Domain registry



2.2 Internet number registry

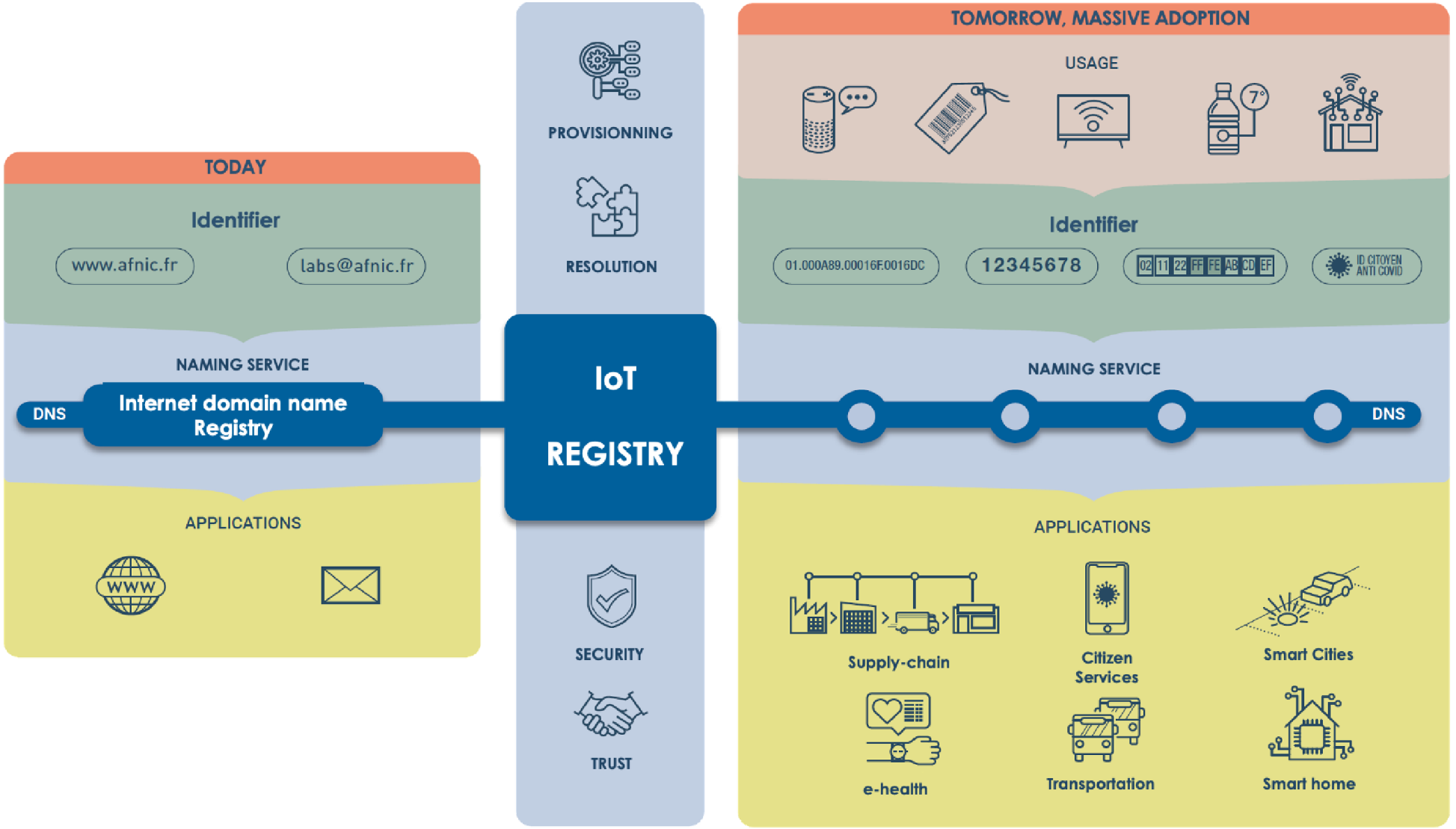


3. Resolution



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Why Afnic (‘.fr’ Registry) Is Speaking about IoT & PQC?



Our experience working with IoT Stakeholders

DONE

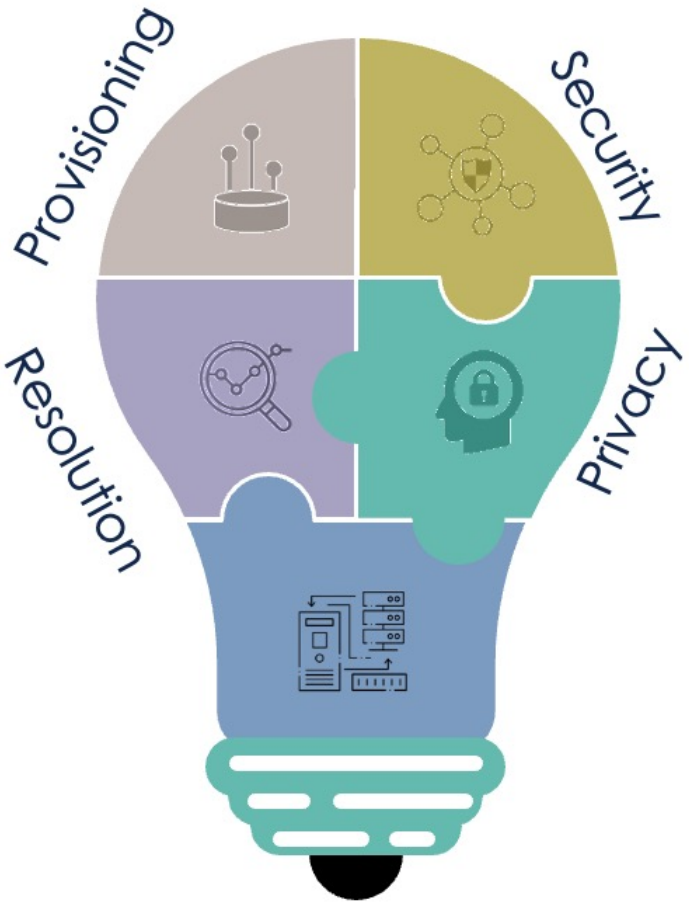
WINGS

Widening interoperability for networking Global supply Chains

PoC

LoRa Alliance®

DNS Service



DONE

DINS*

DNS Naming and Services for Secure Seamless IoT

DONE

PIVOT*

Privacy-Integrated design and Validation in the constrained IoT

What the report looks at?

Today's Pain-Points	Amplified by Quantum Risk
▪ Insecure IoT firmware, weak credentials, botnets (e.g., Mirai, Jeep hack...)	▪ DNSSEC and TLS algorithms used today will be breakable
▪ Supply-chain attacks on IoT cloud infrastructure	▪ A single breach at a resolver or registry could poison millions of devices
▪ Legacy devices and patch gaps	▪ Post-quantum cryptography requires more computing power and larger code sizes

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Policy & Standards landscape

- **US:** NIST PQC algorithms + *2035 federal mandate for migration*
- **EU:** Cyber Resilience Act, EN 18031 IoT security standards, NIS2 Directive + NIS-CG guidance for hybrid cryptography + *2035 roadmap for migration to PQC*
- **IETF:** Drafts in progress on hybrid PQC + ECC integration for TLS, DNSSEC

Registries' Role

Feed real-world operational constraints into standards and policy: **key sizes, latency, energy limits....**

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Our role in the Quantum era

- **DNS –** The address book of the Internet must stay trustworthy **-** *Even for the 75 billion IoT devices*
- We stand ready to
  - Pilot **Post Quantum research** from the Identity perspective
  - Share **Operational lessons** with the IGF
  - Participate/Contribute in the **migration playbook** for IoT

Call to Action

Let's ensure that when quantum day arrives, the world's devices can still **resolve, connect and trust**.

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Thank you for your attention

Do not hesitate to reach out

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