SOLACE

Smart Object Lifecycle Architecture for Constrained Environments

Where do I get my keys?

- IEEE 802.15.4 needs keys
- RPL needs keys
- CoAP/DTLS needs keys

- Lots of desire for
  key management protocols

Secure Bootstrapping Protocol

- We have a solution based on EAP-TLS and raw public keys as certificates
- Based on EAP authentication framework of RFC 5247 (covered in Annex C)
- EAP-TLS (RFC5216) certificate-based mutual authentication and key derivation protocol that uses TLS
- draft-ietf-tls-oob-pubkey extends TLS with raw public key support
- For CoAP devices the usage of X.509-based PKIX certificates is an unnecessary burden
- CoAP device can be configured with a client public key aka raw public key and use it as certificate
- Result: simplified authentication, no need for CAs, reduced code size

What do the keys do?

- Where can I use them?
- What do they authenticate? authorize?
- How do I re-key? get rid of their power?

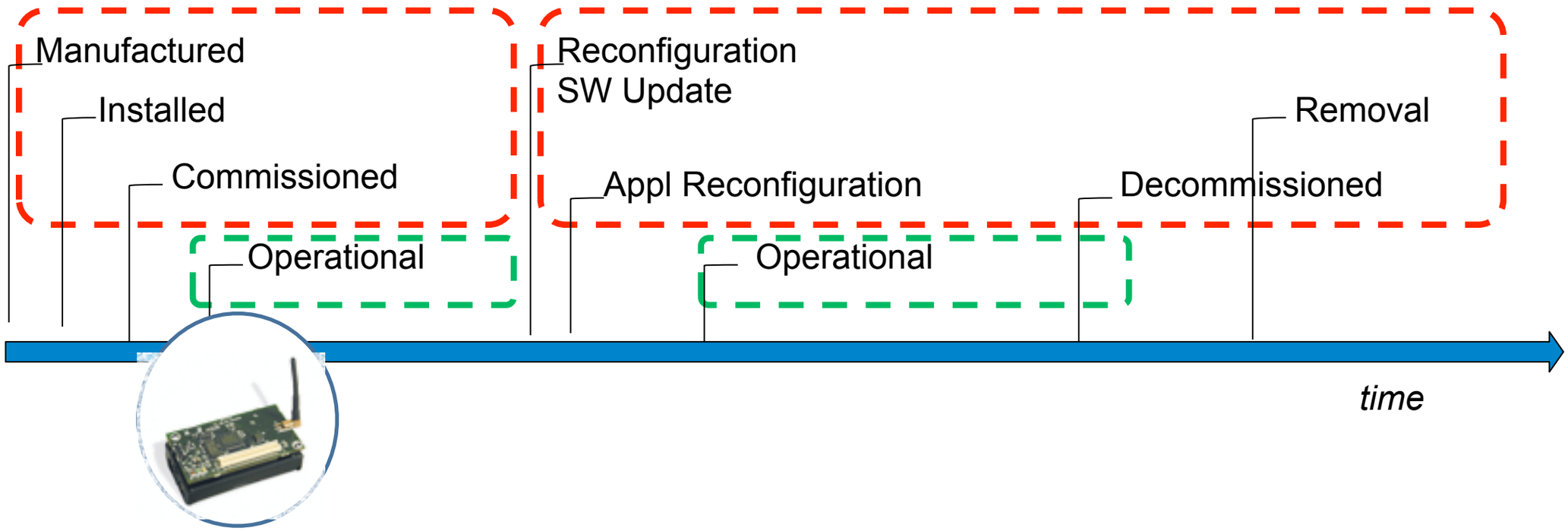
What are my security objectives, anyway?

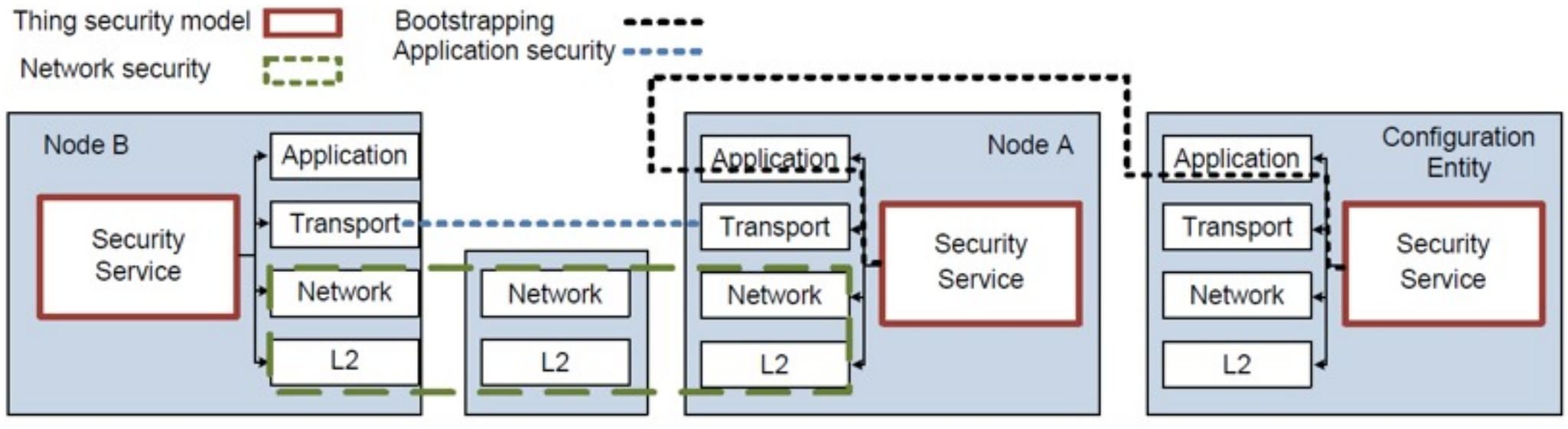
- There is no security without security objectives
- Who tells us those? When? How?
- Who is authorized to make these decisions? Who did they authorize?
- Who owns stuff? data?

General security objectives

- Not subject to a mass attack
- Usable (yes, Virginia, that is a security objective)
- Maintains security over a lifecycle
- ...

Thing lifecycle and security framework





draft-garcia-core-security-04.txt

Objective

- Define enough of the architecture so:
  - we know what we are talking about
    - and have names for the components
  - we know when we have the technology pieces we need

Technology pieces

- Crypto: Symmetric, asymmetric, D-H, hash
- Enrollment: leap of faith, PAKE, …
  - probably most relevant from usability p.o.v.
  - stay reasonable/lightweight per application
- Security protocols: TLS, DTLS, EAP-TLS, …
- Identity: Raw Public Keys, PSK Identity, …

SOLACE:
Where to put it

- We bounced it around the IETF WGs for half a decade or so
- A couple of IAB workshops recently
- IRTF RG?
- Then do remaining missing pieces in IETF.

SOLACE:
How to start it

- Define a usage scenario/use case
- Solicit contributions that
  - spec out the smart object lifecycle,
    from manufacturing via initial keying, establishment of security associations, authorization, configuration, changes to all these (including re-keying), decommissioning (and de-authorization), and recycling/re-use.
  - considering network access, routing, and application layers
- Discuss in Atlanta