Security consideration for the IoT

IETF97

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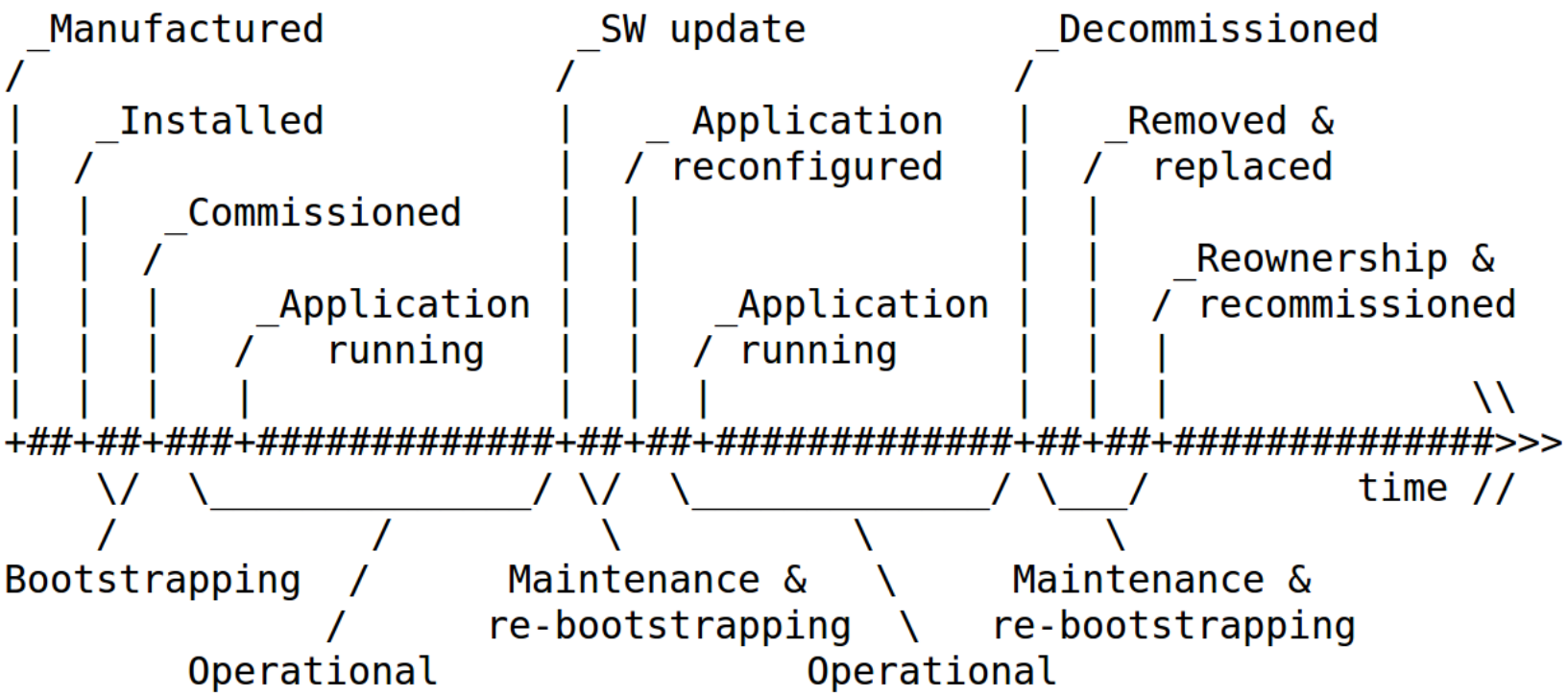
Thing Lifecycle



Threat Analysis

- Cloning of things
- Substitution
- Eavesdropping/Man-in-the-middle
- Privacy
- Denial-of-Service
- Firmware replacement
- Routing attacks

Challenges

- Device heterogeneity
- Protocol translation vs. end-to-end security
- Software update
- Verifying device behavior
- End-of-life
- Penetration testing
- Quantum resistance

Profiles/Architecture/State-of-the-art

- Home/managed home/industrial
- Trade-offs between centralized/distributed management of security
- Profiles for network/application security
- State-of-the-art: IPSec, Minimal IKEv2, DTLS

Contents in old draft-garcia-core-security-06

- Thing lifecycle
- Architectural considerations
- State of the art
- Challenges
  - Constraints
  - Bootstrapping
  - Operation
- Security profiles

Contents in https://tools.ietf.org/html/draft-irtf-t2trg-iot-seccons-00

Reordering

- Thing lifecycle
- Architectural considerations <- updated
- State of the art <- some cleaning
- Challenges
  - Constraints
  - Bootstrapping <- removed, linked to bootstrapping draft.
  - Operation
  - Added challenges
- Security profiles

Next steps (1)

- Draft is rather long
- We would like to make the structure more consistent
- We suggest a uniform structure for each of those sections according to “Security pillars”:
  1. Security architecture (centralized/distributed)
  2. Security model of a “thing” (tamper-resistant h/w)
  3. Security bootstrapping
  4. Network security
  5. Application security

Next steps (2)

- Threats:
  - Threats that are included are relatively generic. A more exhaustive overview can be included
  - Possibly classify them according to different phases of the lifecycle

Next steps (3)

- Security profiles
  - Different application areas tend to have different security requirements
  - Further detail them, in particular, with the expected security properties that are to be provided
  - Keep classification based on “security pillars”

Next steps (4)

- State of the art
  - State of the art is outdated (old internet draft)
  - Classify according to security pillars
  - Include newer references

Next steps (5)

- Challenges
  - Classify them according to the “security pillars”
  - Include for each of them:
    - What the specific challenge is
    - What the potential solution direction might be
  - Note that some challenges are still to be added: https://github.com/t2trg/2015-ietf94/blob/master/t2trg-b.mkd