EAP-NOOB : Nimble Out-of-Band Authentication for EAP

EMU WG, 31 May 2020

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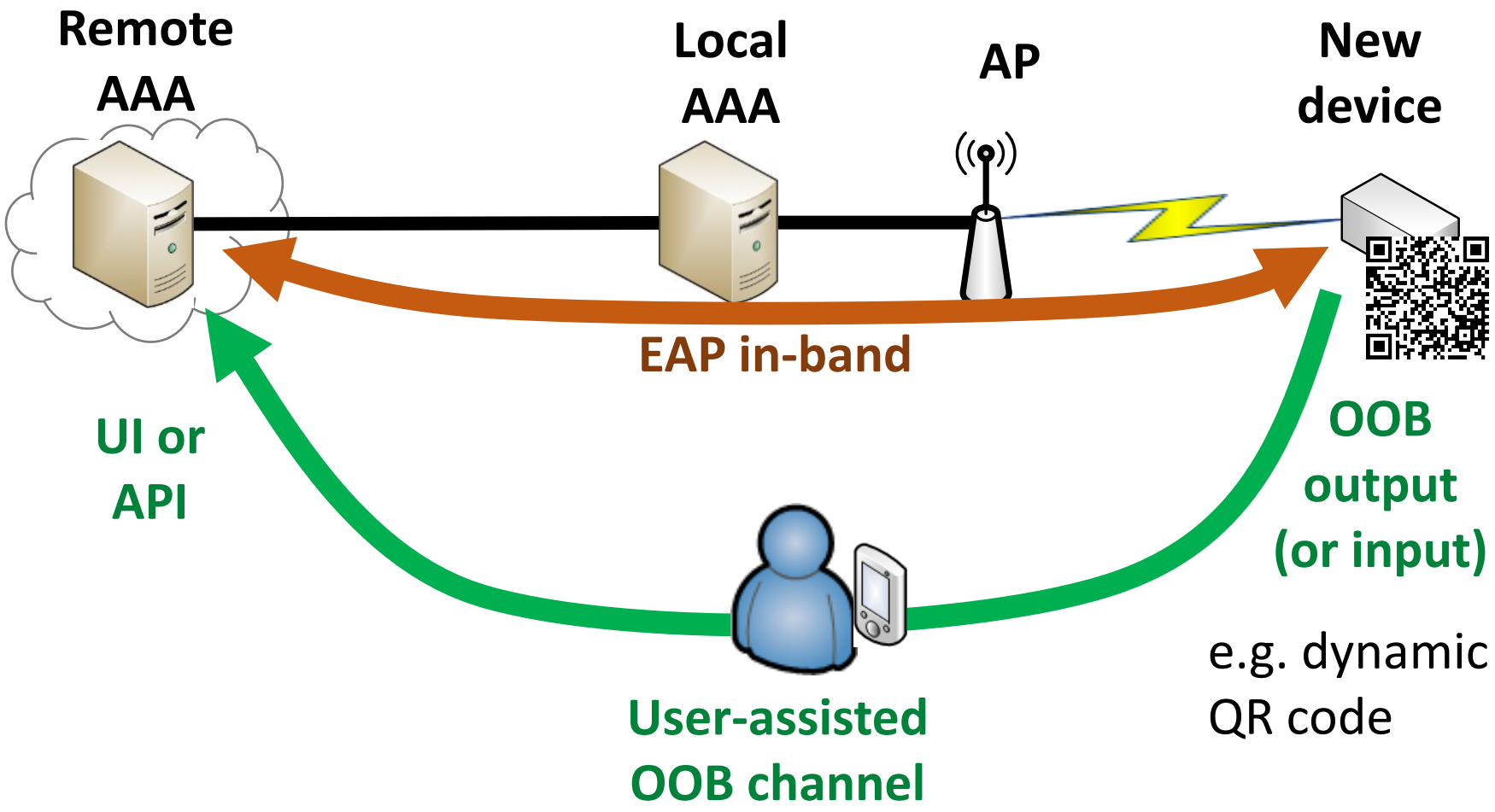
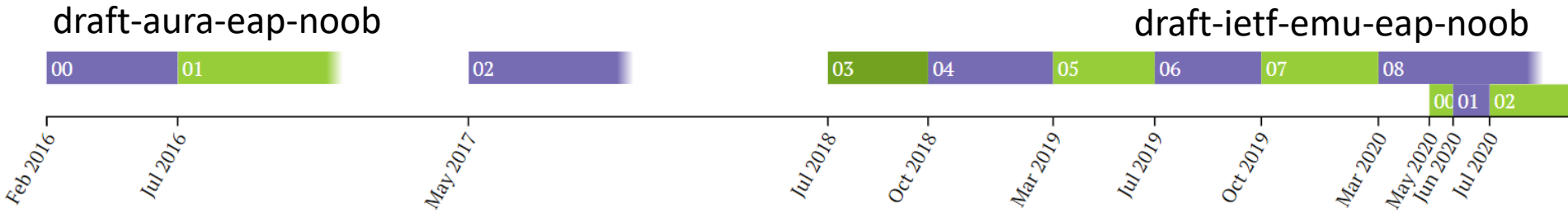
EAP-NOOB architecture



EAP-NOOB timeline

draft-ietf-emu-eap-noob



Changes in since last IETF

- WG Version 01:
  - Add NIST P-256 as Cryptosuite 2
    → Successfully tested ciphersuite update
  - Renumber message types
- WG Version 02:
  - Updated message examples (cross-checked between updated implementations)
  - Many editorial fixes and other updates based on the IoT directorate review by Dave Thaler
  - Text on cloning attacks based on review by Hannes Tschofenig

IoT directorate review by Dave Thaler

Many good observations that led to clarifications and improvement of interoperability in the details:

- Explained the benefits of dynamic OOB vs static registration code
- Replaced printer with LED and light bulb as the example of output-only peer device
- Changed MAY to MUST where it makes sense for interoperability
- More precise about character sets, string length, and upper vs lower case hex
- Specifying ServerInfo and PeerInfo? Not before we gain experience of where the protocol is actually used
- To be added: discussion of server UI clogging attacks

Review by Hannes Tschofenig

Challenged us in a friendly way about the goals and assumptions.

- Need to consolidate remarks about not repeating the OOB step and user reset, which are currently scattered around the document
- Added discussion of cloning to security considerations

Early IANA review

- Amanda Baber : “we don't have any issues with the document.”

TODO at the right time:

- Request EAP method number from IANA
- Reserve domain name eap-oob.arpa for the NAI

JSON vs. CBOR

- CBOR given serious thought but rejected in 2016. However, there has been progress since.
  - Implementations https://cbor.io/impls.html
  - CBOR signatures RFC 8152 vs JWK
- *wpa_supplicant* has a built-in JSON encoder and parser.
- Factors to consider:
  - Completeness and stability of the specifications and implementations
  - Major changes like new message encoding cause substantial delay: need to update spec and implementations
  - **(Lack of) canonical form that enables extraction of message fields and composing an unambiguous HMAC input**
- We need WG advice on this.

EAP-NOOB implementation status

- wpa_supplicant and hostapd by Aalto University and others https://github.com/tuomaura/eap-noob
- wpa_supplicant and hostapd by Ericsson: https://github.com/Vogeltak
  - Based on the above, refactored code, updated to latest draft
- Contiki: https://github.com/eduingles/coap-eap-noob

- Formal models in mCRL2 (protocol and DoS-resistance) and ProVerif (authentication)

Next steps

Only one major open issue:

- Decision on staying with JSON vs changing to CBOR

Editorial TODO:

- Update of security considerations and other explanations based on the recent reviews and other discussions