Constrained BRSKI (cBRSKI)

draft-ietf-anima-constrained-voucher-21

Image: various brands of constrained brewski

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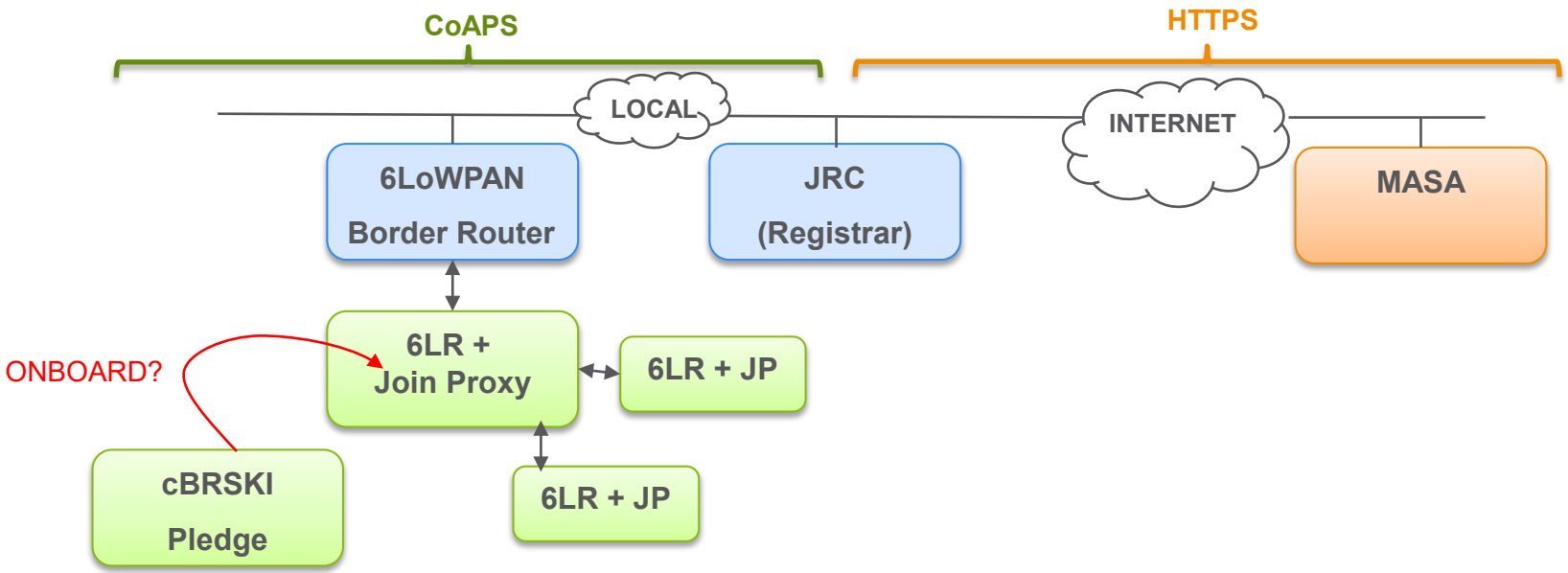
Recap & Goal – Constrained BRSKI

- **cBRSKI = Constrained BRSKI**
- **cBRSKI = CoAP BRSKI ☺**

Recap & Goal – Constrained BRSKI

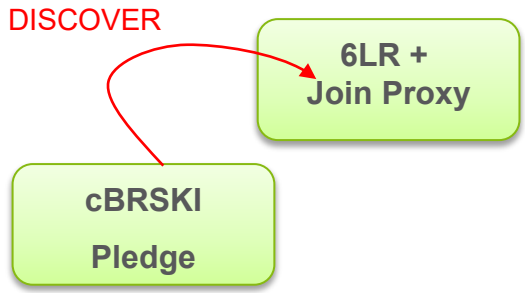
› **TLDR:** BRSKI onboarding, for constrained (IoT) devices & networks

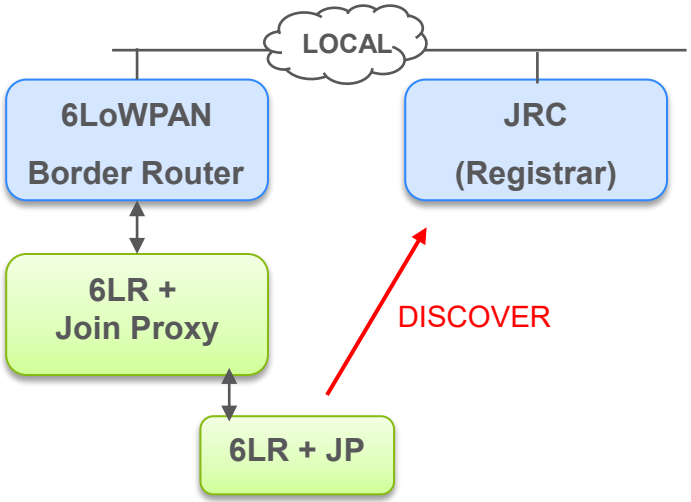


Issue 1: Discovery Variations

- **Discovery method for Pledge → Join Proxy ?**
  - 1. CoAP discovery (link-local multicast request)
  - 2. mDNS (link-local multicast request)
  - 3. GRASP (link-local advertisements)
  - 4. Network-specific (e.g. Thread, 6TiSCH ...)

- **Discovery method for Join Proxy → Registrar?**
  - 1. CoRE Resource Directory (RD)
  - 2. Unicast DNS-SD
  - 3. GRASP
  - 4. Network-specific





Issue 1: Discovery Variations

- **Discovery method for Pledge → Join Proxy ?**
  - Method used by Pledge MUST be supported by Join Proxy, else no interoperability!
- **Discovery method for Join Proxy → Registrar?**
  - Method used to register the Registrar MUST match discovery method of Join Proxy, else no interoperability!
- **Mixing methods in a single deployment is unwanted complexity**
- **Are we okay with *allowing* multiple discovery methods?**

  Implies that interoperability needs to be achieved outside IETF or by a future document.

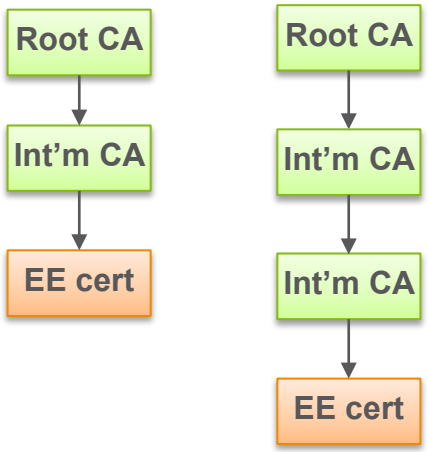
Issue 1: Discovery Variations

- **Possible Proposal**
  - Push the issue out of scope
  - Only define 1 discovery variant: CoAP Discovery using CoRE Link Format payloads
  - Leave further discovery optimizations to future documents, such as **draft-eckert-anima-brski-discovery**
  - This draft should define general mechanisms that are easily translated between the different discovery technologies

Issue 2: support 2-tier and 3-tier CAs #275

- Current draft defines a simplification ...
- ... which **allows a Pledge to get only 1 domain CA certificate via the "/cacerts" request**

- **But:** this hampers the support of 2-tier and 3-tier CA structures – which will get more & more common



- **Proposed Solution:** a new format that avoids PKCS#7 container
- Using CoAP multipart (RFC 8710) – a CBOR array

```
[60, <CBOR-encoded-integer-number-N>, 287, <first-X509-binary-cert> ]
```

where N is the total number of CA certs available. Once N is known, the client can CoAP-GET the remaining (N-1) CA certificates (GET /.well-known/est/crts/<N>)

Thank you!

Comments/questions?

https://github.com/anima-wg/constrained-voucher/

Recap & Goal – Constrained BRSKI

› **cBRSKI = Constrained BRSKI = CoAP BRSKI ☺**
  – draft-ietf-anima-constrained-voucher-21

› **BRSKI onboarding, for constrained (IoT) devices & networks**

  – Suitable for wireless 6LoWPAN mesh networks and other constrained IP networks
  – Minimize time & code overhead: round-trips, format parsing, optional functions, ...

  – CoAP + DTLS ⇨ instead of HTTP + TLS
  – COSE-signed CBOR ⇨ instead of CMS-signed JSON
  – Constrained EST-coaps ⇨ instead of 'classic' EST

Updates Since -18 (@IETF-115)

- **YANG extensions** to the Voucher (extending RFC 8366) all **moved** to draft-RFC8366-bis
- Old Voucher / Voucher-Request **examples updated** + more examples
- IANA section added for **GRASP discovery**
- Detailed CoAP discovery
- DTLS text pulled into one section (version, handshake fragmentation, ...)
- Major editorial text rewrites!

Open Issues (kept in Github)

- **https://github.com/anima-wg/constrained-voucher/issues**

- **10 issues open**
  - (Issues labeled “future” or “interop” are not for the document)

- Media type **application/voucher+cose** – are we okay? #264
  instead of ‘application/voucher-cose+cbor’

Pending Updates (Github PR)

- **https://github.com/anima-wg/constrained-voucher/pulls**

- **Scheduled for next version -22:**
  - Update terminology to RFC8366-bis (#280)
  - Add mDNS discovery (#279)
  - Rename Voucher media type to application/voucher+cose (#277)

FYI - Implementations & Interop

- **Minerva.sandelman.ca**
  - Registrar – Fountain
  - MASA – Highway
  - Pledge (simulated) – Reach
- **IoTconsultancy.nl OpenThread Registrar fork**
  - includes Registrar, MASA, Pledge (simulated)
  - code for OpenThread embedded Pledge (not public)
  - aims for integration into an automated testing framework ~ also testing “out of spec” cases
  - using **Github issue tracker**
- **petervanderstok BRSKI**
  - and test MASA
- **Siemens-BT Registrar & MASA**