draft-friel-acme-integrations

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Use Cases

- ACME issuance of sub-domain certificates
- Multiple client / device certificate integrations
  1. EST
     - RFC 7030 - Enrollment over Secure Transport
  2. BRSKI
     - draft-ietf-anima-bootstrapping-keyinfra - Bootstrapping Remote Key Infrastructures
  3. TEAP
     - RFC 7170 – Tunnel Extensible Authentication Protocol
  4. TEAP-BRSKI
     - draft-lear-eap-teap-brski - Bootstrapping Key Infrastructure over EAP

Related Drafts

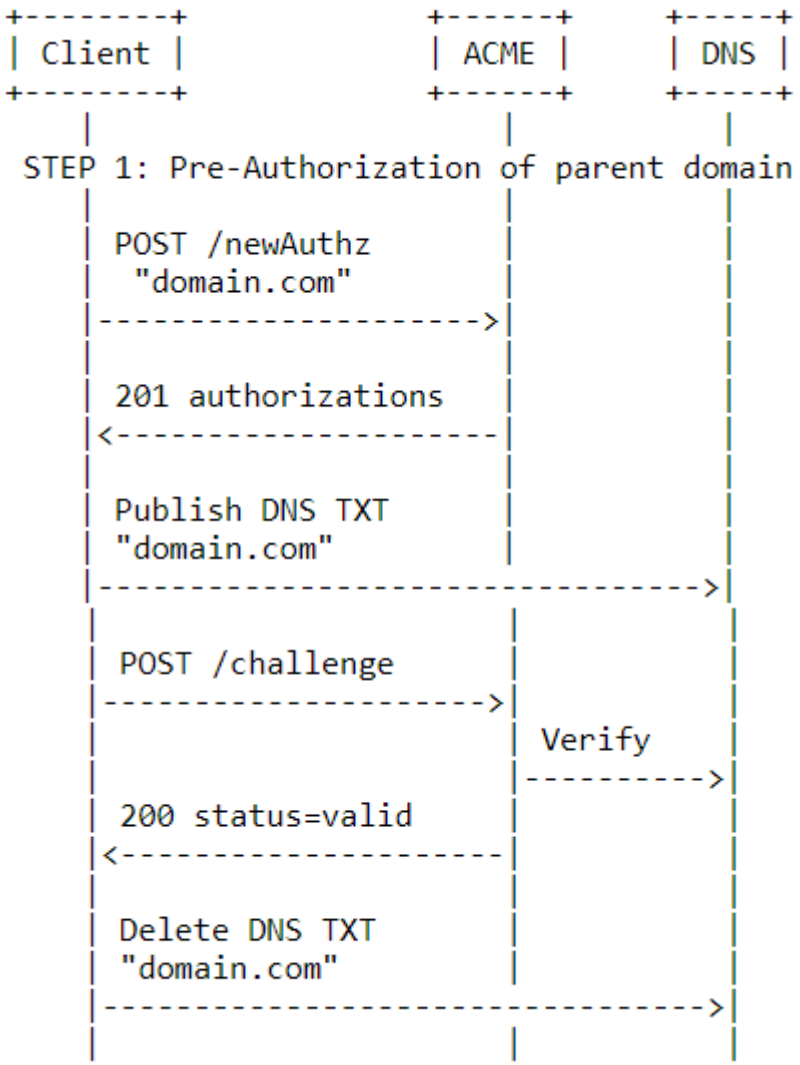
- draft-yusef-acme-3rd-party-device-attestation
- draft-moriarty-acme-client

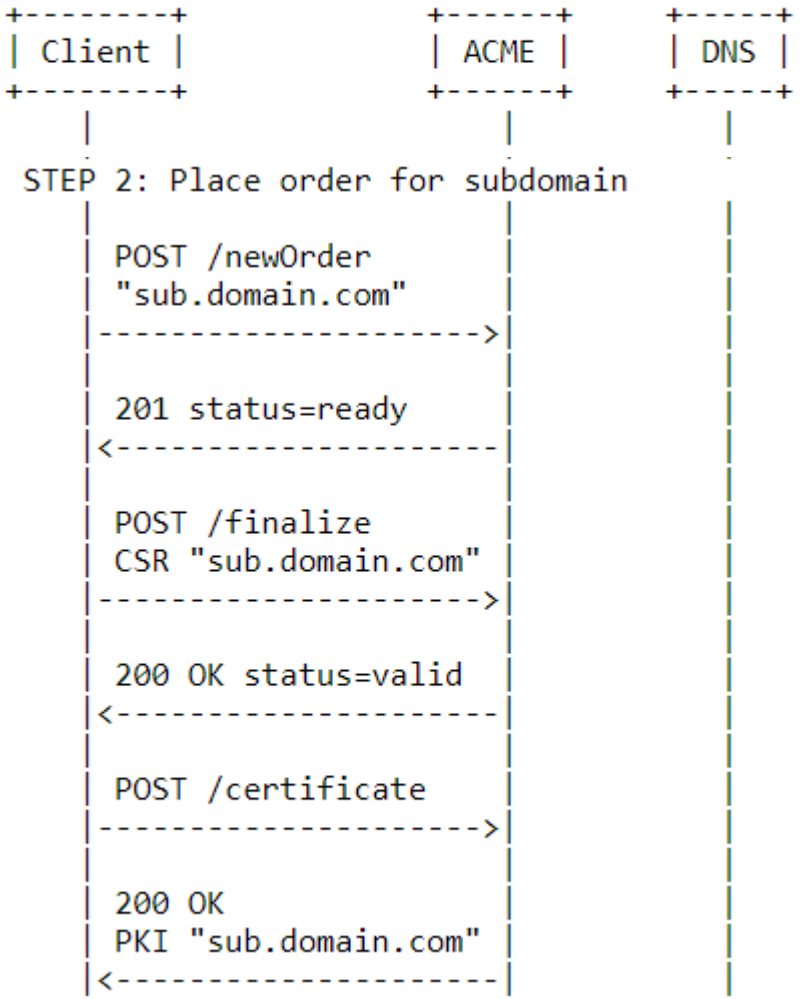
- Preliminary discussions about alignment have taken place
- Side meeting scheduled
  - Coller meeting room
  - 9am Wednesday morning

Sub-domain certificates

- ACME mandates that
  - The **identifier** in CSR must match **identifier** in **newOrder** request
  - The **identifier** in the **authorization** object must be used when fulfilling challenges via HTTP or DNS
- ACME does *not* mandate that
  - The **identifier** in a **newOrder** request matches the **identifier** in **authorization** object
- The specification therefore allows an ACME server to issue certificates for a given identifier (e.g. a subdomain) without requiring a challenge to be explicitly fulfilled against that identifier
  - An ACME server could issue a certificate for **sub.domain.com** where the ACME client has only fulfilled a challenge for **domain.com**
  - An ACME server could issue certificates for a number of sub-domain certificates and only require a single challenge to be fulfilled against the parent domain

Sub-domains with pre-authorization

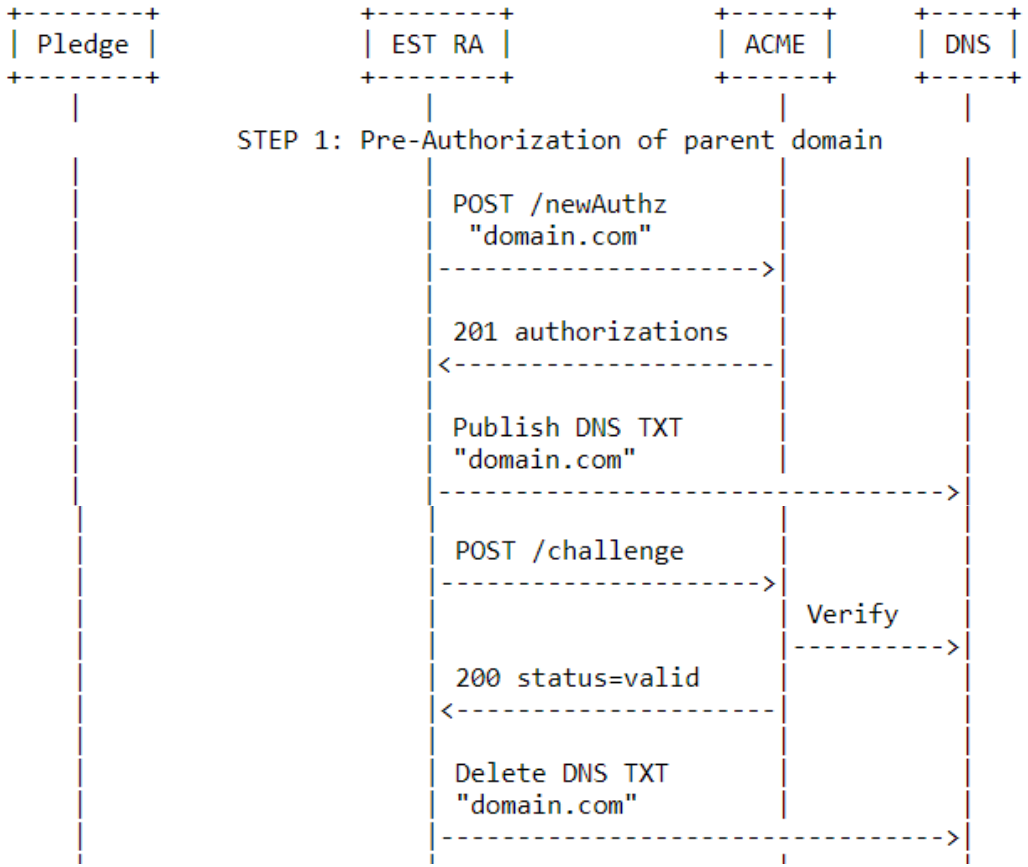


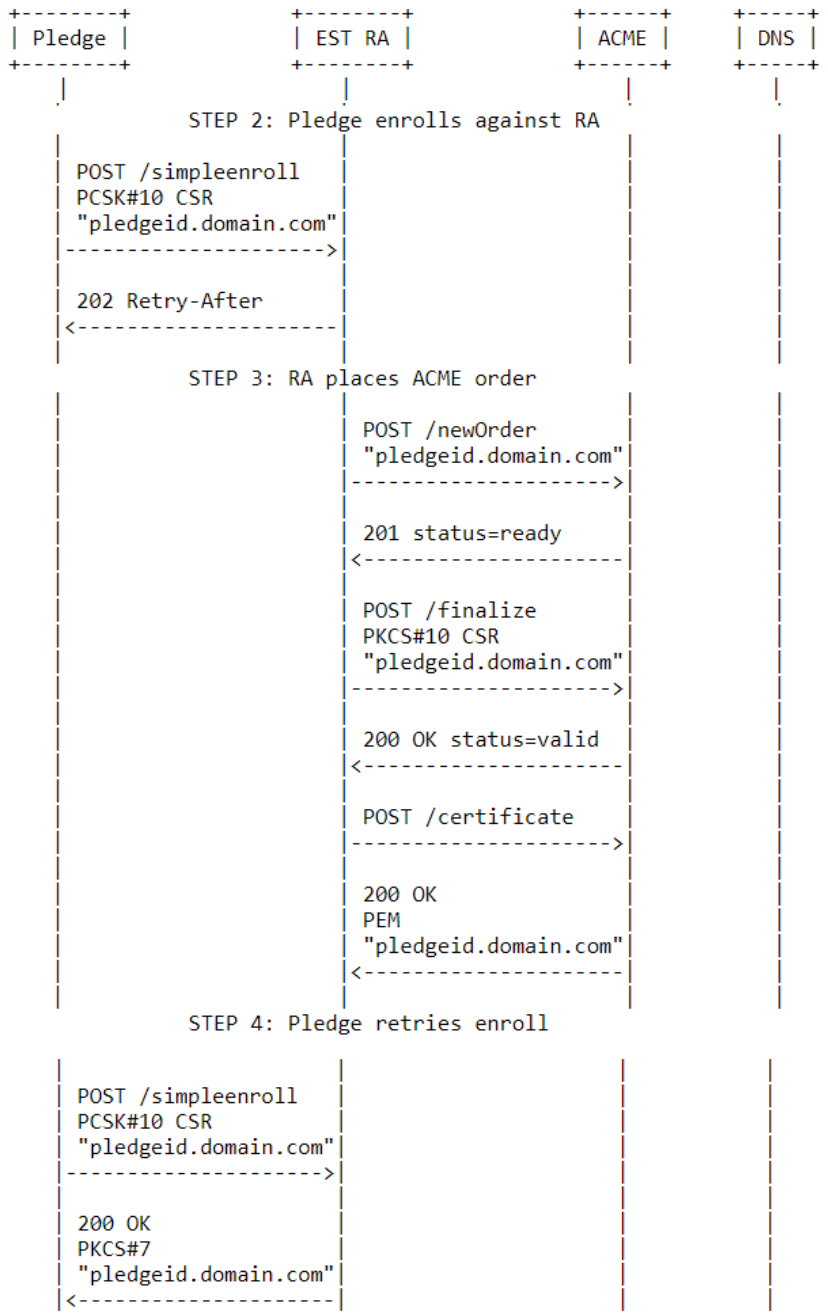


Client / device certificate integrations

- EST (which BRSKI leverages) defines the protocol that clients use to enrol with an EST Registration Authority (RA) using PKCS#10 / PKCS#7 payloads
  - EST does not define the mechanism that the RA uses to talk to the CA
- TEAP (which TEAP-BRSKI leverages) defines the protocol that clients use to enrol with a TEAP server using PKCS#10 / PKCS#7 payloads
  - TEAP does not define the mechanism that the TEAP server uses to talk to the CA
- The draft illustrates how ACME can be used to integrate an EST RA or a TEAP server with a CA
  - No changes are required to EST, TEAP or ACME specifications
  - The sub-domain proposal is a nice optimisation to facilitate issuance of large numbers of client / device certificates

EST -> ACME


Pledge
EST RA
ACME
DNS
STEP 1: Pre-Authorization of parent domain
POST /newAuthz
"domain.com"
201 authorizations
Publish DNS TXT
"domain.com"
POST /challenge
Verify
200 status=valid
Delete DNS TXT
"domain.com"


Pledge
EST RA
ACME
DNS
STEP 2: Pledge enrolls against RA
POST /simpleenroll
PCSK#10 CSR
"pledgeid.domain.com"
202 Retry-After
STEP 3: RA places ACME order
POST /newOrder
"pledgeid.domain.com"
201 status=ready
POST /finalize
PKCS#10 CSR
"pledgeid.domain.com"
200 OK status=valid
POST /certificate
200 OK
PEM
"pledgeid.domain.com"
STEP 4: Pledge retries enroll
POST /simpleenroll
PCSK#10 CSR
"pledgeid.domain.com"
200 OK
PKCS#7
"pledgeid.domain.com"

Discussion

- Is the sub-domain use case of interest to ACME CAs?
  - Is this worth formally documenting?

- Are the client / device use cases of interest?
  - Note: this short presentation will be given at ACME, ANIMA and EMU sessions
  - Side meeting reminder: Coller, 9am Wednesday