Update on BRSKI-AE – Support for asynchronous enrollment
draft-ietf-anima-brski-async-enroll-00

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Recall: Problem statement & Overview

• There exists various industrial scenarios, which have limited online connectivity to local or backend services either technically or by policy used during onboarding / enrollment.
  • Use Case 1: limited on-site PKI functionality support, requires relying on a backend PKI, to perform (final) authorization of certification requests for operational certificate (LDevID).
  • Use Case 2: limited connectivity to a domain registrar due to different technology stack or limited connectivity
• Draft addresses these issues by updating BRSKI to support authenticated self-contained objects (signed-wrapped objects) for the certificate enrolment to bind proof of possession and proof of identity to the objects in a similar way as already applied for the voucher handling to be transport independent.
Changes from individual version 03 → IETF draft 00

• Inclusion of discovery options of enrollment endpoints at the domain registrar based on well-known endpoints in Section 5.3 as replacement of section 5.1.3 in the individual draft. This is intended to support both use cases in the document. An illustrative example is provided.

• Missing details provided for the description and call flow in pledge-agent use case Section 5.2, e.g. to accommodate distribution of CA certificates.

• Updated CMP example in Section 6 to use lightweight CMP instead of CMP

• Editorial changes to improve structure and readability
Changes from individual version 03 → IETF draft 00
Discovery support

• If multiple enrollment protocols are intended to be supported by the domain registrar, a discovery option is necessary to allow the pledge to pick the appropriate.

• Draft proposes to define new URI for the discovery as "/.well-known/brski"

• GET on "/.well-known/brski" shall return a link to endpoints available at the server

• Draft provides an illustrative example for EST and Lightweight-CMP (see next slide)

• Proposal to rename the endpoints for the voucher handling from “est” to “brski” in BRSKI to underline independence from the enrollment protocols
Changes from individual version 03 → IETF draft 00

Discovery Example

REQ: GET /.well-known/brski
RES: Content

</brski/voucherrequest>,ct=voucher-cms+json
</brski/voucher_status>,ct=json
</brski/requestauditlog>,ct=json
</brski/enrollstatus>,ct=json
</est/cacerts>;ct=pkcs7-mime
</est/simpleenroll>;ct=pkcs7-mime
</est/simplereenroll>;ct=pkcs7-mime
</est/fullcmc>;ct=pkcs7-mime
</est/serverkeygen>;ct= pkcs7-mime
</est/csrattrs>;ct=pkcs7-mime
</cmp/initialization>;ct=pkixcmp
</cmp/certification>;ct=pkixcmp
</cmp/keyupdate>;ct=pkixcmp
</cmp/p10>;ct=pkixcmp
</cmp/getCAcert>;ct=pkixcmp
</cmp/getCSRparam>;ct=pkixcmp
Changes from individual version 03 → IETF draft 00
Details further changes

• Missing details provided for the description and call flow in pledge-agent use case (section 5.2.4):
  • Several editorial enhancements to better distinguish the standard BRSKI from the enhancements for the pledge-agent
  • Included optional distribution of CA certificates in the call flow.

• Updated CMP example in Section 6 to use lightweight CMP instead of CMP
  • Profile provides the necessary functionality for industrial use cases without requiring complete CMP support
  • Draft already provides the necessary /.well-known endpoints
Changes from individual version 03 → IETF draft 00
Details editorial changes

• Editorial changes
  
  • Requirements discussion moved to separate section in Section 4. Shortened description of proof of identity binding and mapping to existing protocols.
  
  • Removal of copied call flows for voucher exchange and registrar discovery flow from [I-D.ietf-anima-bootstrapping-keyinfra] in Section 5.1 to avoid doubling or text or inconsistencies.
  
  • Reworked abstract and introduction to be more crisp regarding the targeted solution. Several structural changes in the document to have a better distinction between requirements, use case description, and solution description as separate sections. History moved to appendix.
Discussion, open issues

#1 Discovery of enrollment options

• Follow proposal in current draft using “GET / .well-known/brski/" resulting in the enumeration of available enrollment options?

• Alternatively align syntax with format provided in COAP related drafts to something like “GET / .well-known/core?rt=brski”
Discussion, open issues

#2 Pledge-agent authentication and authorization in use case 2 towards domain registrar? (relates to section 5.2.4)

- Intention to not require specific device credentials (LDevID, IDevID) for the pledge-agent to authenticate towards domain registrar to allow for arbitrary device usage running the pledge-agent.
- Pledge relies on signed objects from infrastructure (voucher from MASA to accept domain certificate). Infrastructure relies on signed objects from the pledge.
- Proposal to rely on (pledge-agent) operating user authentication if authorization of onboarding is required in the target domain.
Discussion, open issues (cont.)

#3 Provisioning of proximity registrar certificate to pledge necessary?
   • If provided via the pledge agent without authentication may not provide benefit → would result in requirements for the data exchange between pledge and pledge-agent (which is not part of this document) to be based on mutual trust between pledge and pledge-agent.
   • Rely on voucher response containing the domain registrar certificate

#4 Consideration of different transport options in the addressing scheme for the enrollment protocol?
   • Proposal to align with BRSKI (HTTPS) as BRSKI-AE is intended to update BRSKI

   • IANA considerations for addressing scheme have to be defined.
Next Steps

• Further refinement of the approach. Address open issues and discussion points stated throughout the draft

• Goal is reuse of BRSKI architecture elements and described call flows for both use cases described in BRSKI-AE.

• The intended scope of the draft would update the BRSKI document.

• PoC currently being implemented for Use Case 2 (Pledge Agent).