GNAP Meeting Interim 2021-10

draft-ietf-gnap-core-protocol-07

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Agenda

- Core draft update
  - Trust relationships
  - Security considerations
  - Privacy considerations
- Open Issues
  - Symmetric Crypto
  - SOLID use cases
  - End-user vs. RO
  - Generic HTTP access type
- What topics to focus on for IETF 112?

Draft Changes

- Collapse of “user_handle” into subject identifier constructs
- Trust Relationships
- Security Considerations
- Privacy Considerations

User Handle

- Use “subject information” opaque identifier instead of separate user handle
- Simplifies the protocol, uses constructs we already have

Response from AS:

```
{
  "subject": [{
    "format": "opaque",
    "id": "XUT2MFM1XBIKJKSDU8QM"
  }]
}
```

Request from Client Instance:

```
{
  "user": "XUT2MFM1XBIKJKSDU8QM"
}
```

(or)

```
{
  "user": [{
    "format": "opaque",
    "id": "XUT2MFM1XBIKJKSDU8QM"
  }]
}
```

Trust Relationships

- Defined using promise theory (new informative reference)
  - allowing for a formal trust model, including threats
- New section 1.4 details the promises between end-user/RO, end-user/client, client/AS, RS/RO, AS/RO, AS/RS
- Refers to security and privacy considerations

$$A_1 \overset{b}{\textbf{Trusts}} A_2. \tag{10.4}$$

In this case, trust is seen to be a dual concept to that of a promise. If we use the notation of ref. [BFb], then we can write trust as one possible valuation $v : \pi \to [0, 1]$ by A_1 of the promise made by A_2 to it:

$$A_1[A_2] \overset{b}{\textbf{Trusts}} A_2[A_1] \leftrightarrow v_1(A_2 \xrightarrow{b} A_1) \tag{10.5}$$

This is then a valuation on a par with economic valuations of how much a promise is worth to an agent[BFb]. The recipient of a promise can only make such a valuation if it knows that the promise has been made.

Proposal 1 (Trust). *An* agent's expectation *that a promise will be kept. It may be assigned a value lying between 0 and 1, in the manner of a Bayesian probability.*

Proposal 2. *Trust of an agent S by another agent R can exist if agent R is informed that agent S has made a promise to it in the past, or if the recipient of the promise R is able to infer by indirect means that S has made such a promise.*

Security Considerations

- 21 Subsections, including:
  - TLS is required
  - You have to protect your keys and other artifacts
  - Bearer tokens cause problems
  - Use real crypto and randomization
  - Front-channel redirects are inherently susceptible to attack
  - You have to check all the hashes and signatures
  - Pre-registration doesn’t solve all the problems you think it does
  - MTLS doesn’t solve all the problems you think it does
  - Just because something is signed doesn’t mean you can trust it

Privacy Considerations

- Modeled after RFC6793
- Main topics:
  - Surveillance
    - Surveillance by the Client
    - Surveillance by the Authorization Server
  - Stored Data
  - Intrusion
  - Correlation
    - Correlation by Clients
    - Correlation by Resource Servers
    - Correlation by Authorization Servers
  - Disclosure in Shared References

Open Issues

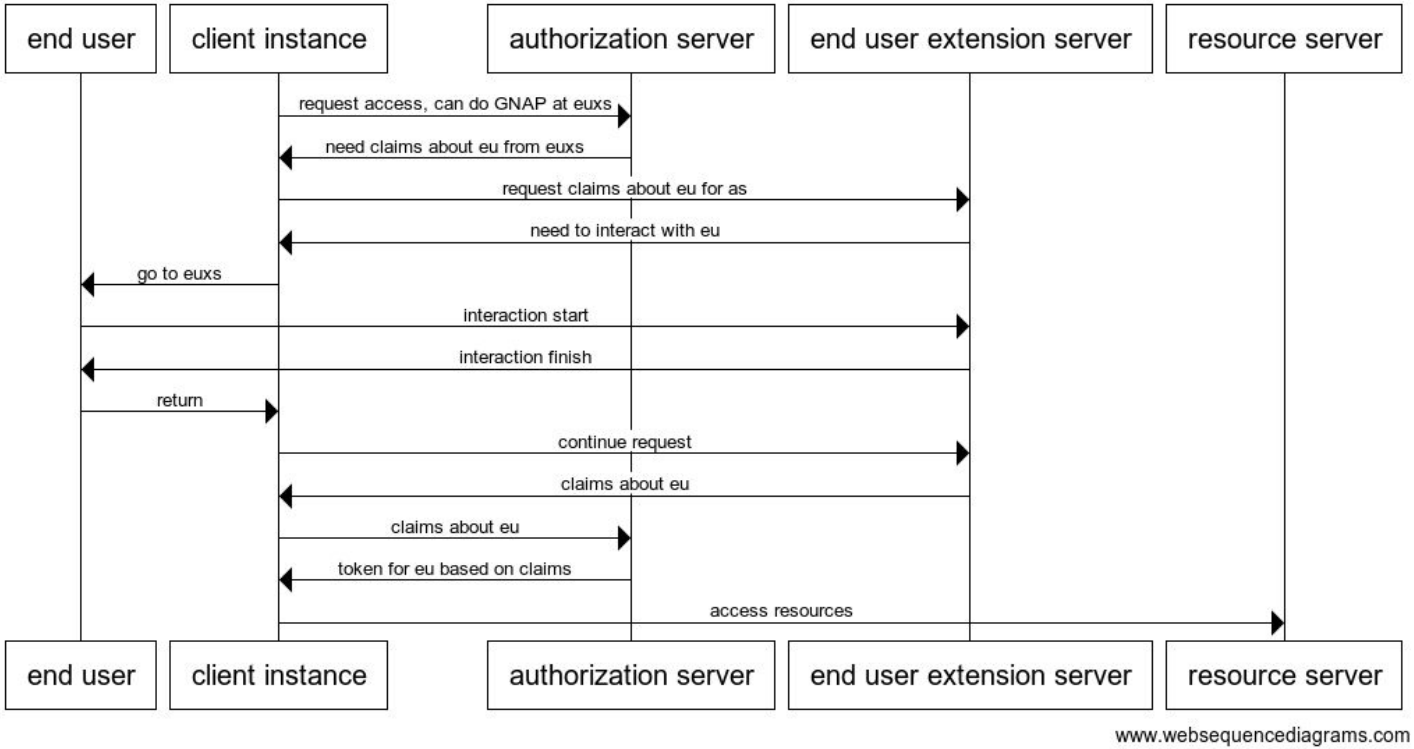
Symmetric Cryptography

- Issue #299: Should we completely disallow symmetric cryptography?
- Reasons to disallow:
  - Symmetric crypto relies on keys being in the hands of both parties
  - Asymmetric crypto exists and is functional
- Reasons to allow:
  - Underlying crypto methods allow for symmetric cryptography
  - GNAP does not allow for symmetric key **distribution**
    - Only identifiers can get passed around
  - KMS and key derivation are safe practices
  - Post-quantum cryptography is largely symmetric

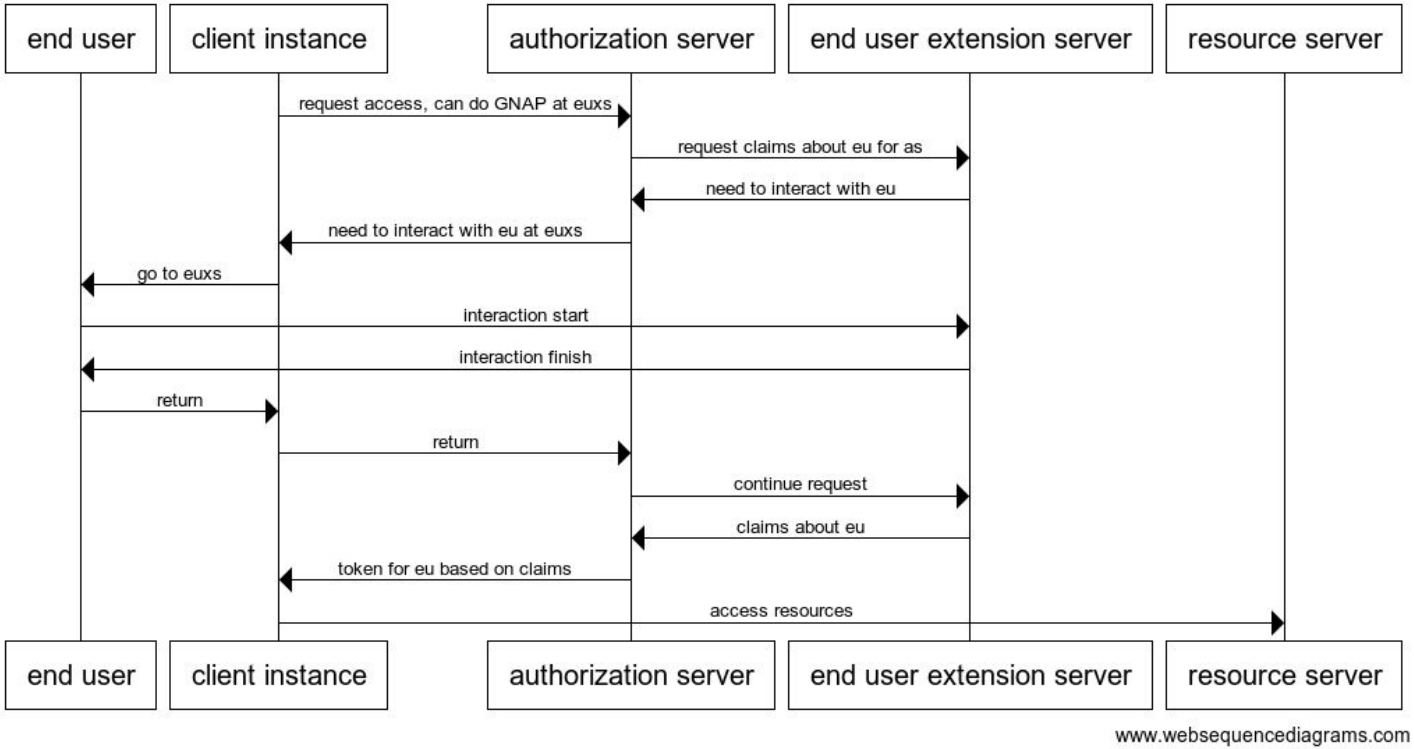
SOLID use case

- Client has access to provable claims about end-user
  - Can get these through a secondary AS
  - Backed by WebID trust in SOLID ecosystem
- Client presents claims to AS for access
  - AS maps claims about user to an RO and policy for an RS/resource set
  - AS probably doesn’t interact with end-user
- Dynamic discovery is necessary, pre-registration not tenable
- Application of consent-and-interaction phases?
  - Client tells AS that it can talk to EU’s server to get additional info if wanted
  - A kind of reciprocal GNAP?

Case 1: Client gets artifact from external service



Case 2: AS gets artifact from external service



Open Questions

- Case 1:
  - Presumes a verifiable artifact that client can carry to AS
  - Client could pre-load this artifact
- Case 2:
  - AS acts as client to external AS
  - AS can’t interact with end user normally
  - Is this any different from the mix-up attack we just patched against?

End-user vs. RO

- Two different roles for users in GNAP:
  - “End-user” uses the client software
  - “RO” controls access to the protected resources
- In OAuth they’re always the same person
  - GNAP interaction lets you connect the end-user to the AS so they can act as RO
  - GNAP doesn’t require end-user to be RO if AS can reach the RO (or their policy) somehow
- Subject information muddles this distinction
  - When the client is asking for subject info, it wants to know who the end-user is
  - If the RO isn’t the same as the end user, isn’t this an error?
- Draft text isn’t always clear about cases where end-user and RO are different

Generic HTTP Access Type

- The “access” object’s “type” field is up to the API being protected (AS/RS)
- What if we had a “generic HTTP” type?
  - Applicable to nearly all HTTP APIs out of the box
  - “actions” maps to verbs
  - “locations” maps to URLs (or templates)
  - “datatypes” maps to mime types
- Should we do this?
  - Do all RS’s need to understand these types now?
- If we do this, where?
  - Inside GNAP core
  - Inside GNAP-RS
  - In another extension in GNAP
  - In an external document (outside of IETF?)

Additional Topics for IETF 112?