Notification of Revoked Access Tokens in the ACE Framework

draft-tiloca-ace-revoked-tokens-notification-01

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Motivation

- An Access Token may be revoked, before expiration
  - Client or RS has been compromised, or decommissioned
  - Changed access policies
  - Changed ACE profile to use

- In OAuth
  - Token revocation by Client exists (RFC 7009)
  - No revocation by Resource Owner or RS
  - Not a problem, Tokens expire fast

- Different assumptions in ACE
  - E.g. RS has intermittent connectivity, Tokens don't expire fast
  - How can the AS tell C and RS about revoked tokens?

Contribution

- New interface at the AS
  - The AS maintains one Token Revocation List (TRL) resource
  - The TRL contains the hashes of revoked, not-yet-expired tokens
  - C/RS can GET or GET-Observe from the TRL
  - C/RS retrieve only their own pertaining portion of the TRL

- Benefits
  - Complement token introspection at the AS
  - No need for new endpoints at C or RS

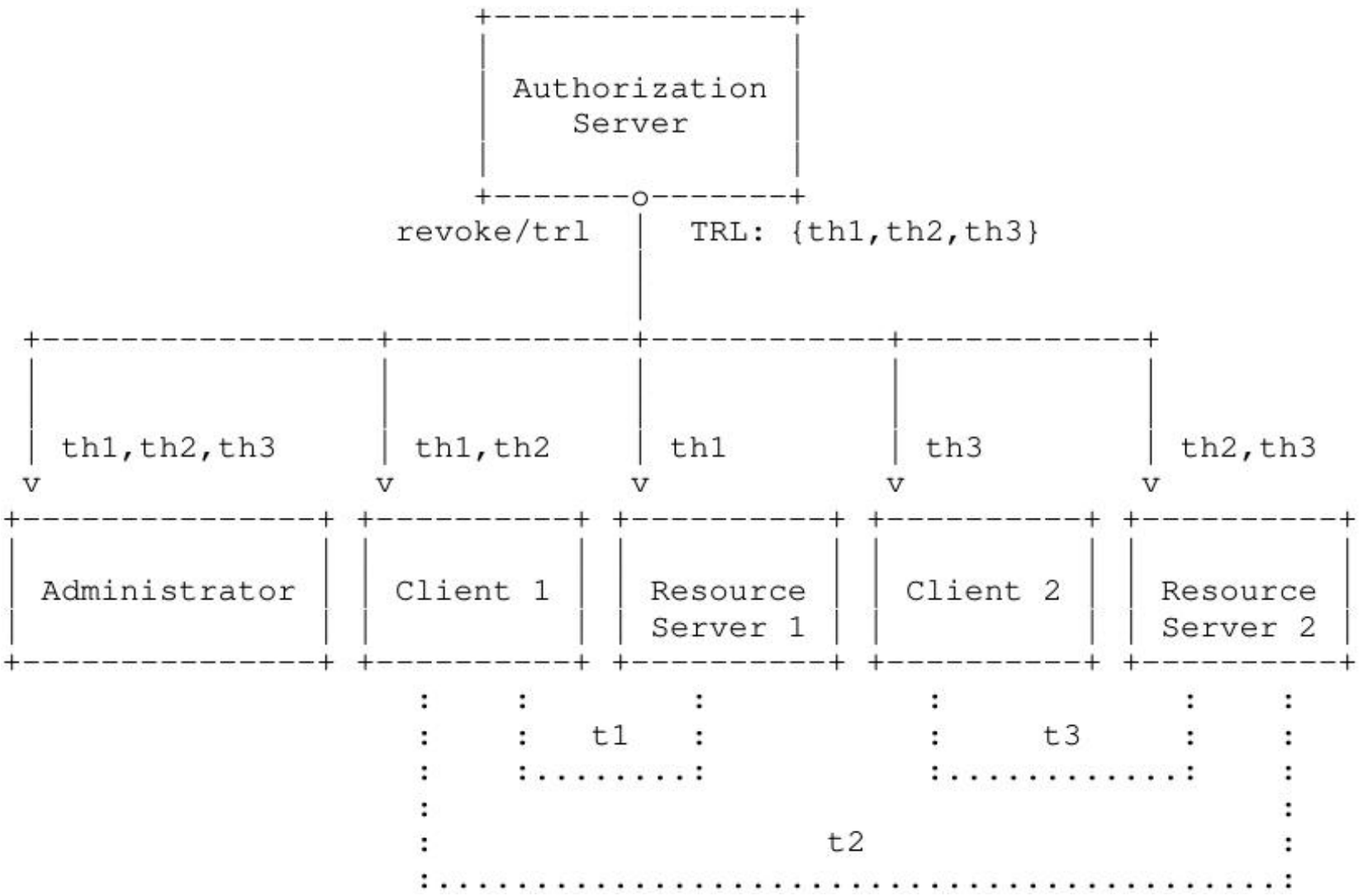
- Updates in -01 from Travis' review [1] and Jim input – Thanks!

[1] https://mailarchive.ietf.org/arch/msg/ace/1UK5QuLh4kmzlH211JBtotdchfQ/

Rationale

- Token hash, as Token name/ID
  - Not ‘cti’, the Token is opaque to the Client
  - Computed as per RFC 6920, Section 6
  - Support for both CBOR and JSON transport
- Token Revocation List (TRL) at the AS
  - CBOR array of Token hashes
  - Add token hashes when Tokens are revoked
  - Remove token hashes when revoked Tokens expire
- Interaction
  - C and RS get the URL to the TRL endpoint upon registration
  - C and RS obtain only hashes of their own pertaining Tokens
  - A registered Administrator gets all Token hashes in the TRL

Protocol overview



Two types of TRL queries

- Common features
  - Limited to the portion of the TRL pertaining the requester
  - TRL filtering based on authenticated identity of the requester (secure session)

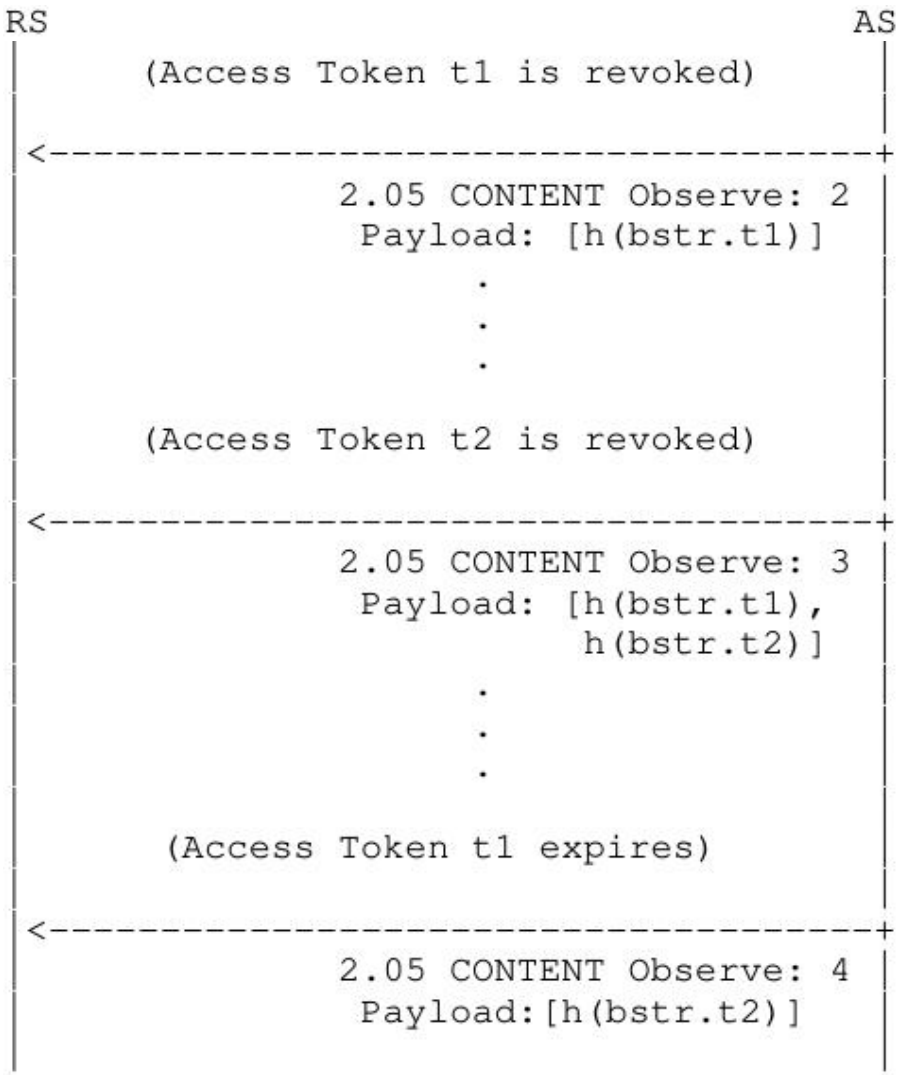
- **Full query – *GET [Observe: 0] example_as/revoke/trl***
  - Request for all pertaining token hashes in the TRL
  - Return a CBOR array, with the Token hashes as elements

- **Diff query – *GET [Observe: 0] example_revoke/trl?diff=true[&N=3]***
  - Request for the latest N updates to the pertaining portion of the TRL list
  - Build N entries as CBOR maps. Each entry refers to an update and has:
    - A field “deleted”, with a CBOR array of Token hashes as element.
    - A field “added”, with a CBOR array of Token hashes as element.
  - Return a CBOR array with the N entries as element, in reverse chronological order

Example


RS
AS
Registration: POST
2.01 CREATED
Payload: {
...
"trl" = "revoke/trl"
}
GET Observe: 0
coap://example.as.com/revoke/trl/
2.05 CONTENT Observe: 1
Payload: []
(Access Tokens t1 and t2 issued
and successfully submitted to RS)

Example (ctd.)


RS
AS
(Access Token t1 is revoked)
2.05 CONTENT Observe: 2
Payload: [h(bstr.t1)]
(Access Token t2 is revoked)
2.05 CONTENT Observe: 3
Payload: [h(bstr.t1),
h(bstr.t2)]
(Access Token t1 expires)
2.05 CONTENT Observe: 4
Payload:[h(bstr.t2)]

Summary

- Notification of revoked Access Token
  - GET or GET-Observe; full query and diff query
  - Complement token introspection at the AS
  - No need for new endpoints on Clients and Resource Servers

- Version -01 incorporates:
  - Review from Travis Spencer
  - Input and comments from Jim

- Next steps
  - Add CDDL notation
  - More workflow examples, e.g. for diff query interactions
  - Integer compression of “added” and “deleted” for Diff queries

- Need more feedback and reviews

Thank you!

Comments/questions?

https://gitlab.com/crimson84/draft-tiloca-ace-revoked-token-notification