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OAuth 2.0 Introspection over the Constrained Application Protocol (CoAP)

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Abstract

This document defines a method for a client or resource server to query an OAuth authorization server to determine meta- information about an OAuth token using the Constrained Application Protocol (CoAP) [4]. An client in possession of a OAuth2 token can use it to get metadata about the token like validity and approved scopes.

Status of This Memo

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1. Introduction

OAuth2 enables clients to access protected resources by obtaining an access token, which is defined in "The OAuth 2.0 Authorization Framework" [2] as "a string representing an access authorization issued to the client", rather than using the resource owner's credentials directly.

Tokens are issued to clients by an authorization server and the client uses the access token to access the protected resources hosted by the resource server. This document defines a way for a holder of this token, mostly Clients and Resource Servers, to get metadata like validity and scopes for the token. The OAuth Token Introspection specification [14] defines a way to validate the token using HTTP POST or HTTP GET. This document reuses the work done in the OAuth Token Introspection and defines a mapping of the request and response to CoAP [4] to be used by constrained devices.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in "Key words for use in RFCs to Indicate Requirement Levels" [1].

This document also re-uses terminology from RFC 6749 [2] and RFC 6750 [6].

3. Introspection CoAP Endpoint

The Introspection CoAP Endpoint responds to CoAP Confirmable requests from token holders, particularly Clients and Resource Servers. The endpoint takes a single parameter representing the token (and optionally further authentication) and returns a JSON [7] document representing the meta information surrounding the token. The endpoint MUST be protected by DTLS [5] or equivalent.

4. Introspection Request

The token holder makes a request to the Introspection CoAP Endpoint by adding the following parameters using the "application/x-www-form-urlencoded" format with a character encoding of UTF-8 in the CoAP request entity-body:

In order to prevent man-in-the-middle attacks, the client MUST require the use of DTLS with server authentication for any request sent to the authorization and token endpoints. If certificate-based server authentication is used then the client MUST validate the TLS certificate of the authorization server, as defined by RFC6125.

The Endpoint SHOULD also require some form of authentication to access this endpoint, such as the Client Authentication as described in OAuth 2.0 [RFC6749] or equivalent.

t: REQUIRED. The string value of the token.

rid: OPTIONAL. A service-specific string identifying the resource that the client doing the introspection is asking about.

hint: OPTIONAL. A hint about the type of the token submitted for introspection. Clients MAY pass this parameter in order to help the authorization server to optimize the token lookup. If the server is unable to locate the token using the given hint, it MUST extend its search across all of its supported token types. An

authorization server MAY ignore this parameter, particularly if it is able to detect the token type automatically. Values for this field are defined in OAuth Token Revocation [RFC7009].

cid: OPTIONAL. Client id if client password defined in section 2.3.1 in RFC 6750 [6] is used.

cid: OPTIONAL. Client secret if client password defined in section 2.3.1 in RFC 6750 [6] is used.

Question: Should we keep, the longer, original attribute names to make it easier for CoAP-HTTP proxies and Authorization Server implementations?

5. Introspection Response

If the introspection request is valid and authorized, the authorization server responds with a CoAP message using Content response code with the response encoded as a JSON structure in the payload of the message. If the request failed client authentication or is invalid, the authorization server returns an error response using the CoAP 4.00 'Bad Request' response code with the error messages defined in Section 5.2 of RFC 6749 [2].

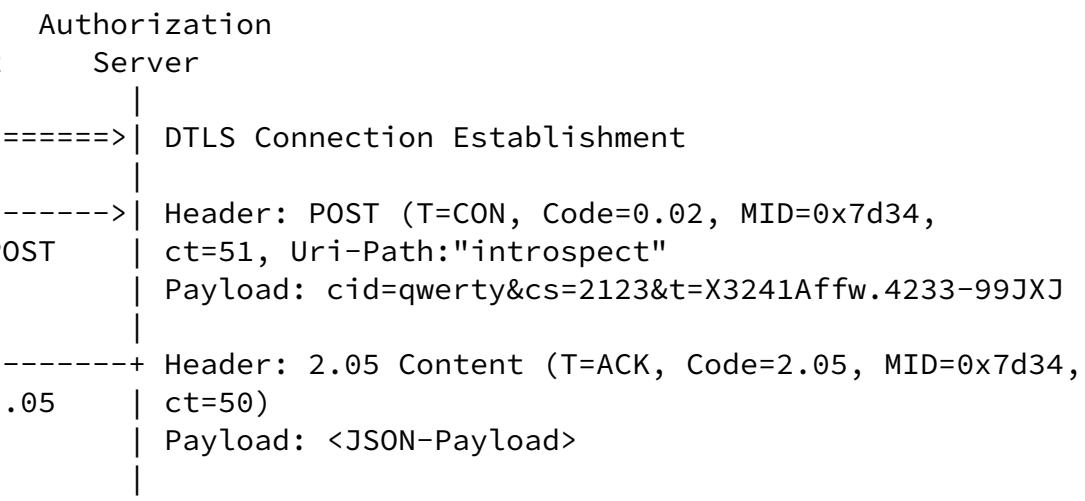
The JSON structure in the payload response includes the top-level members defined in Section 2.2 in the OAuth Token Introspection specification [14]. It's recommended to only return the active attribute considering the lossy and constrained nature of CoAP client and server network and capacity.

Note that the HTTP "Cache-Control" parameters MAY be used in the CoAP response message.

6. Example

For example, the client makes a CoAP request carrying the introspection request protected with DTLS to the authorization server. It then receives a response containing metadata about the token.

In the example below content-type 51 corresponds to the 'application/x-www-form-urlencoded'.



<JSON-Payload>:=

```
{
 "active": true
}
```

Figure 1: Example CoAP Introspection Exchange.

7. Security Considerations

TBD

8. IANA Considerations

TBD

9. Acknowledgements

The author would like to thank Justin Richer for his work on [14] richer-oauth-introspection and Hannes Tschofenigs [10] and [11]. This document is heavily inspired from those document's and it borrows a lot of texts from there work. The author would also like to thank Samuel Erdtman for valuable input.

10. References

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