Mutual X.509 Transport Layer Security (TLS) Authentication for OAuth Clients
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Abstract

This document describes X.509 certificates as OAuth client credentials using Transport Layer Security (TLS) mutual authentication as a mechanism for client authentication to the authorization server’s token endpoint.

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1. Introduction

The OAuth 2.0 Authorization Framework [RFC6749] defines a shared secret method of client authentication but also allows for the definition and use of additional client authentication mechanisms when interacting with the authorization server’s token endpoint. This document describes an additional mechanism of client authentication utilizing mutual TLS [RFC5246] certificate-based authentication.

1.1. Requirements Notation and Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

2. Mutual TLS for Client Authentication

The following section defines, as an extension of OAuth 2.0, Section 2.3 [RFC6749], the use of mutual TLS as client credentials. OAuth 2.0 requires that access token requests by the client to the token endpoint use TLS. In order to utilize TLS for client authentication, the TLS connection MUST have been established or reestablished with mutual X.509 certificate authentication (i.e. the Client Certificate and Certificate Verify messages are sent during the TLS Handshake [RFC5246]).
For all access token requests to the token endpoint, regardless of
the grant type used, the client MUST include the "client_id"
parameter, described in OAuth 2.0, Section 2.2 [RFC6749]. The
presence of the "client_id" parameter enables the authorization
server to easily identify the client independently from the content
of the certificate and allows for trust models to vary as appropriate
for a given deployment. The authorization server can locate the
client configuration by the client identifier and check the
certificate presented in the TLS Handshake against the expected
credentials for that client.

3. Metadata

The value "tls_client_auth" is used to indicate mutual TLS as an
authentication method to the token endpoint for the
"token_endpoint_auth_methods_supported" client metadata field defined
in [RFC7591], Section 2.

The same "tls_client_auth" value can also indicate server support for
mutual TLS as a client authentication method in authorization server
metadata such as [OpenID.Discovery] and [I-D.ietf-oauth-discovery].

4. IANA Considerations

4.1. Token Endpoint Authentication Method Registration

This specification requests registration of the following value in
the IANA "OAuth Token Endpoint Authentication Methods" registry
[IANA.OAuthTEAuthnMeths] established by [RFC7591].

4.1.1. Registry Contents

- Token Endpoint Authentication Method Name: "tls_client_auth"
- Change Controller: IESG
- Specification Document(s): [[ this specification ]]

5. Security Considerations

5.1. TLS Versions and Best Practices

TLS 1.2 [RFC5246] is cited in this document because, at the time of
writing, it is latest version that is widely deployed. However, this
document is applicable with other TLS versions supporting
certificate-based client authentication. Implementation security
considerations for TLS, including version recommendations, can be
found in Recommendations for Secure Use of Transport Layer Security
(TLS) and Datagram Transport Layer Security (DTLS) [BCP195].
5.2. Client Identity Binding

No specific method of binding a certificate to a client identifier is prescribed by this document. However, some method should be employed so that, in addition to proving possession of the private key corresponding to the certificate, the client identity is also bound to the certificate. One such binding would be to configure for the client a value that the certificate must contain in the subject field or the subjectAltName extension and possibly a restricted set of trust anchors. An alternative method would be to configure a public key for the client directly that would have to match the subject public key info of the certificate.

6. References

6.1. Normative References


6.2. Informative References


Appendix A. Acknowledgements

Scott "not Tomlinson" Tomilson and Matt Peterson were involved in the original design and implementation work that informed the content of this document.

Appendix B. Document History

- Initial draft.

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