

# [MS-OAUTH2EX]: OAuth 2.0 Authentication Protocol Extensions

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## Revision Summary

Date	Revision History	Revision Class	Comments
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# 1 Introduction

OAuth 2.0 Authentication Protocol Extensions describes extensions to the OAuth 2.0 Authentication Protocol. These extensions consist of additional parameters in the request **URI** and the **JSON** objects returned in the **HTTP** response body.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [\[RFC2119\]](#). Sections 1.5 and 1.9 are also normative but does not contain those terms. All other sections and examples in this specification are informative.

## 1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

**Coordinated Universal Time (UTC)**  
**Hypertext Transfer Protocol (HTTP)**  
**Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)**  
**principal**  
**realm**  
**X.509**

The following terms are defined in [\[MS-OFCGLOS\]](#):

**JavaScript Object Notation (JSON)**  
**Representational State Transfer (REST)**  
**security token service (STS)**  
**tenant**  
**token**  
**Uniform Resource Identifier (URI)**  
**Uniform Resource Locator (URL)**

The following terms are specific to this document:

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

References to Microsoft Open Specification documents do not include a publishing year because links are to the latest version of the documents, which are updated frequently. References to other documents include a publishing year when one is available.

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.rfc-editor.org/rfc/rfc2119.txt>

## 1.2.2 Informative References

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

[MS-OFGLGLOS] Microsoft Corporation, "[Microsoft Office Master Glossary](#)".

## 1.3 Overview

This document describes extensions to the OAuth 2.0 Authentication Protocol. These extensions consist of additional parameters in the request URI and the JSON objects returned in the HTTP response body. These extensions provide additional functionality, such as finer granularity of token expiry periods, which is incremental over what is provided by the base specification.

## 1.4 Relationship to Other Protocols

## 1.5 Prerequisites/Preconditions

Applications using these extensions must have their **principal (1)** identifiers registered as members of the **realm (1)** managed by the **security token service (STS)** and are able to authenticate to it by exchanging secrets (public key material carried in **X.509** certificates). The applications must also trust tokens issued by the STS. These preconditions are established during deployment of new **tenants**.

## 1.6 Applicability Statement

These extensions are used in OAuth 2.0 Authentication requests for obtaining an access **token** for use with **REST** bases service requests.

## 1.7 Versioning and Capability Negotiation

None.

## 1.8 Vendor-Extensible Fields

None.

## 1.9 Standards Assignments

None.

## 2 Messages

### 2.1 Transport

No specific parameters are passed to the transport layer. The transport layer, **HTTPS**, is used for securing messages and tokens sent over the wire.

### 2.2 Message Syntax

Parameters in these extensions are either transmitted in the request body in **URL**-encoded form or in the response as part of a JSON object. Tokens returned in conjunction with use of this protocol conform to the JWT specification.

XML based serialization is not used with these extensions or underlying protocols.

## 3 Protocol Details

### 3.1 Common Details

This specification defines additional parameters for use with OAuth 2.0 Authentication Protocol messages. These parameters convey additional semantics related to the access token being requested and about the access token returned as part of these messages. This specification does not define any additional messages over the base specification.

#### 3.1.1 Abstract Data Model

The following parameters are used in conjunction with the OAuth 2.0 Authentication Protocol.

Mandatory parameters when using the extensions defined in this specification.

**Parameter name:** resource

**Parameter usage location:** Request body, URL encoded

**Type:** string, URI value expected

**Semantics:** This parameter indicates the target resource that the caller wants to talk to. Value is expected to be URI format as defined in RFC 3986

**Parameter name:** not\_before

**Parameter usage location:** Response body in JSON object

**Type:** string, **UTC** value expected

**Semantics:** Token returned in the OAuth parameter access\_token as part of this response is not valid before the time specified in this parameter.

**Parameter name:** expires\_on

**Parameter usage location:** Response body in JSON object

**Type:** string, UTC value expected

**Semantics:** Token returned in the OAuth parameter access\_token as part of this response will no longer be valid at the time specified in this parameter.

Optional parameters when using the extensions defined in this specification.

**Parameter name:** realm

**Parameter usage location:** Request body, URL encoded or Response body in JSON object

**Type:** string

**Semantics:** Indicates the realm that the caller is part of.

**Parameter name:** created\_on

**Parameter usage location:** Request body, URL-encoded or Response body in JSON object

**Type:** string, UTC value expected

**Semantics:** Token returned in the OAuth parameter `access_token` as part of this was created at the time specified in this parameter.

**Parameter name:** `expires_in`

**Parameter usage location:** Response body in JSON object

**Type:** string, int value expected.

**Semantics:** Lifetime of the token returned in the OAuth parameter `access_token` as part of this response specified in seconds.

### 3.1.2 Timers

None.

### 3.1.3 Initialization

Connections made using the underlying OAuth 2.0 Authentication Protocol are what initiate use of the extensions defined in this specification.

### 3.1.4 Higher-Layer Triggered Events

None.

### 3.1.5 Message Processing Events and Sequencing Rules

The token request contains the elements indicated in section [3.1.1](#).

#### 3.1.5.1 Protected Resource

This resource indicates the protected resource that the user is trying to get access to.

##### 3.1.5.1.1 Request Access

For gaining access to a resource, an access token with the elements mentioned in section [3.1.1](#) need to be presented.

##### 3.1.5.1.1.1 Request Body

Refer to the section [4.1](#).

##### 3.1.5.1.1.2 Response Body

Refer to the section [4.2](#).

##### 3.1.5.1.1.3 Processing Details

None.

### 3.1.6 Timer Events

None.



### **3.1.7 Other Local Events**

None.

## 4 Protocol Examples

### 4.1 Example request for token to access a resource

The following is an example request for token to access a resource:

```
POST https://example.com/tokens/OAuth/2 HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Host: example.com
Content-Length: 660
Expect: 100-continue
grant_type=http%3a%2f%2foauth.net%2fgrant_type%2fjwt%2f1.0%2fbearer&assertion=eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6Ikm5Q1l1UHpvYnVtejVoM3lZb3FJb3hHWFFwNCJ9.eyJhdWQiOiIwMDAwMDAwMS0wMDAwLTAwMDAtYzAwM0wMDAwMDAwMDAwMDAvc3RzLWludC1zbjEtMDAzLmFjY2Vzc2Nvb3RyY2wueWwkaW50LndpbmRvd3MtaW50Lm5ldEBtZ29vZG51ci5jb20iLCJpc3MiOiJDTj1lBQ1MyQ2xpZW50Q2VydG1maWNhdGVAbWdvb2RuZXIuY29tIiwibmJmIjoimTY1NTMzOSIsImV4cCI6IjEzZmJmE2NTg5MzkiZjQ.XcO8kUte4PKjPwpmXiTBKo4bDAAVJW1eB9d69Nmpaumj19vqw-
N0wLIDN4M6btn_G1BYgcPh0l3hl7Lsxs7E2SfssIegY_KuHZJIdb3pyc0KNzfcoolxIZRFQDK3zmYKICBEQCJ9nHBLcL4Y8AXkZVddYjGo-104M4rg0AcXMZU&resource=example.com/resouce
```

### 4.2 Response with token to access requested resource

The following is an example of a response with token to access the requested resource:

```
HTTP/1.1 200 OK
Cache-Control: public, no-store, max-age=0
Pragma: no-cache
Content-Type: application/json; charset=utf-8
Expires: Fri, 18 Nov 2011 22:28:59 GMT
Last-Modified: Fri, 18 Nov 2011 22:28:59 GMT
Vary: *
Server: Microsoft-IIS/7.5
Set-Cookie: ASP.NET_SessionId=5v3qtoiaxr3m21gdbbai0cxu; path=/; HttpOnly
X-AspNetMvc-Version: 2.0
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
X-Content-Type-Options: nosniff
Date: Fri, 18 Nov 2011 22:28:59 GMT
Content-Length: 1146
{
  "access_token": "eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6IlhxcM5GRWZzUzU1X3ZnQnBIckYwcFRucWVhTSJ9.eyJhdWQiOiJtaWwkaW50LndpbmRvd3MtaW50Lm5ldEBtZ29vZG51ci5jb20iLCJpc3MiOiJDTj1lBQ1MyQ2xpZW50Q2VydG1maWNhdGVAbWdvb2RuZXIuY29tIiwibmJmIjoimTY1NTMzOSIsImV4cCI6IjEzZmJmE2NTg5MzkiZjQ.XcO8kUte4PKjPwpmXiTBKo4bDAAVJW1eB9d69Nmpaumj19vqw-
  "token_type": "http://oauth.net/grant_type/jwt/1.0/bearer",
  "expires_in": "3599",
  "scope": "example.com/resource@guid",
  "not_before": "1321655340",
  "expires_on": "1321658940"
}
```

## **5 Security**

### **5.1 Security Considerations for Implementers**

Security considerations described in underlying specifications and in profiles referencing this extension specification should be considered when using these extensions.

### **5.2 Index of Security Parameters**

None.

## 6 Appendix A: Full JSON Schema

For ease of implementation, the following is the full JSON schema for this protocol.

```
"not_before" : {
  "type" : "string",
  "format" : "date-time"
},
"expires_on" : {
  "type" : "string",
  "format" : "date-time"
},
"realm" : {
  "type" : "string",
  "format" : "uri"
},
"created_on" : {
  "type" : "string",
  "format" : "date-time"
},
"expires_in" : {
  "type" : "integer"
}
}
```

## 7 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft Lync 2013
- Microsoft Lync Server 2013
- Microsoft Exchange Server 2013
- Microsoft SharePoint Server 2013
- Microsoft SharePoint Foundation 2013

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

## 8 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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