API Security : Securing APIs with OAuth (2-legged)

Duration : 30 mins
Persona : API Team/Security

Use case

You have a set of APIs that are consumed by trusted partners. You want to secure those APIs using a two legged OAuth.

How can Apigee Edge help?

Apigee Edge quickly lets you secure your APIs using out of the box OAuth policies. OAuth defines token endpoints, authorization endpoints, and refresh endpoints. Apps call these endpoints to get access tokens, to refresh access tokens, and, in some cases, to get authorization codes. These endpoints refer to specific OAuth 2.0 policies that execute when the endpoint is called.

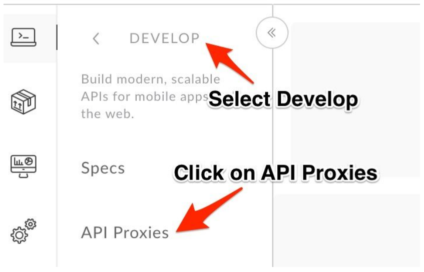
Most typically, the client_credentials grant type is used when the app is also the resource owner. For example, an app may need to access a backend cloud-based storage service to store and retrieve data that it uses to perform its work, rather than data specifically owned by the end user. This grant type flow occurs strictly between a client app and the authorization server. An end user does not participate in this grant type flow. In this flow, Apigee Edge is the OAuth authorization server. Its role is to generate access tokens, validate access tokens, and pass authorized requests for protected resources on to the resource server

Pre-requisites

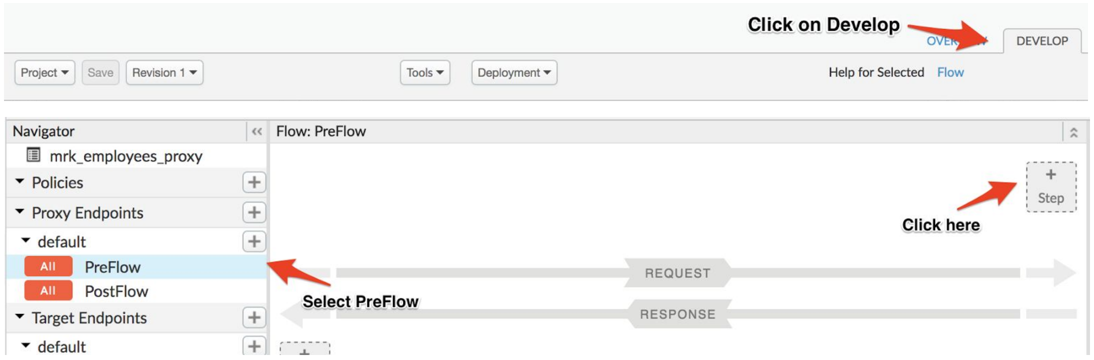
- You have an OAuth API proxy in Apigee Edge. This is API proxy is created by default when you provision an Edge instance on Cloud. If this does not exist, let your instructor know.
- You have an API Proxy that is not currently secured. If you do not have an API Proxy available for this lab, revisit the lab “API Development - Create a Reverse Proxy”.
- You have the following created on Apigee Edge - an API Product, a Developer and an App. If not, jump back to “API Publishing - Packaging APIs” lab.

Instructions

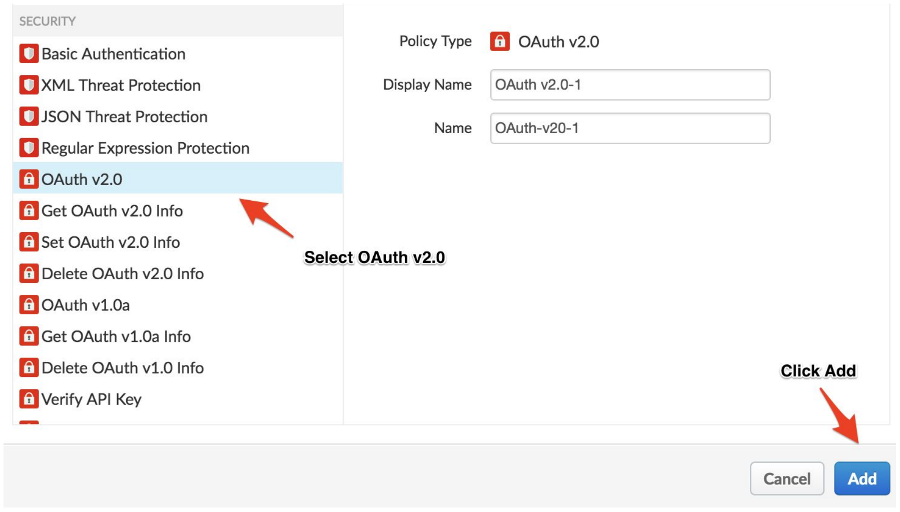
- Go to https://apigee.com/edge and log in. This is the Edge management UI.
- Select **Develop → API Proxies** in the side navigation menu



- Click on the API proxy that you created in "API Development - Create a Reverse Proxy" lab.
- Click on the **Develop** tab. Select **PreFlow** from the sidebar under **Proxy Endpoints** section.



- Click on Add Step and in the dialog, select **OAuth v2.0** from the Security section then click the Add button

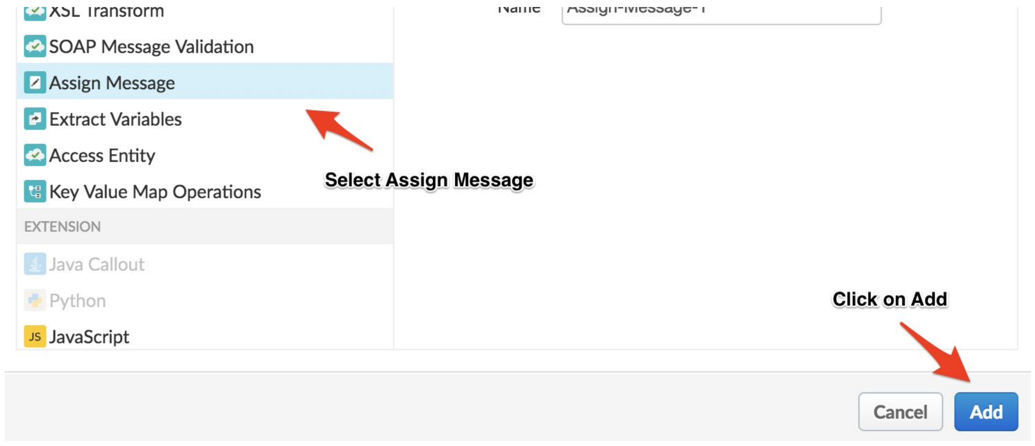


Policy Type: OAuth v2.0
Display Name: OAuth v2.0-1
Name: OAuth-v20-1

- Click on the policy and in the code editor, paste the code give below

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<OAuthV2 async="false" continueOnError="false" enabled="true"
name="OAuth-v20-1">
     <DisplayName>OAuth v2.0-1</DisplayName>
     <ExternalAuthorization>false</ExternalAuthorization>
     <Operation>VerifyAccessToken</Operation>
     <SupportedGrantTypes/>
     <GenerateResponse enabled="true"/>
</OAuthV2>
```

- Once again click on Add Step and in the dialog, select **Assign Message** policy from the Mediation section then click the Add button.

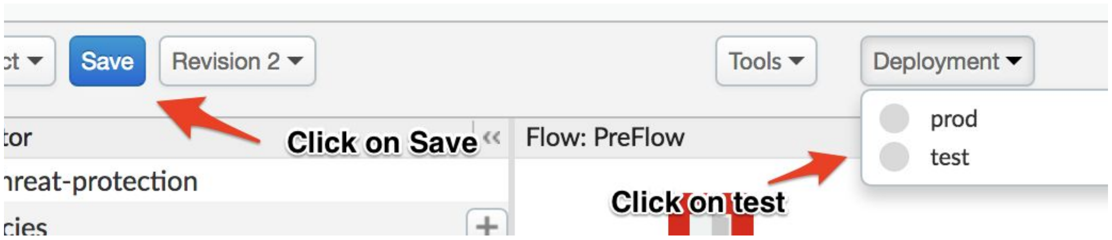


- Click on the policy and in the code editor, paste the code give below

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<AssignMessage async="false" continueOnError="false" enabled="true"
name="Assign-Message-1">
      <DisplayName>Assign Message-1</DisplayName>
      <Remove>
         <Headers>
            <Header name="Authorization"/>
         </Headers>
      </Remove>
      <IgnoreUnresolvedVariables>true</IgnoreUnresolvedVariables>
      <AssignTo createNew="false" transport="http" type="request"/>
</AssignMessage>
```

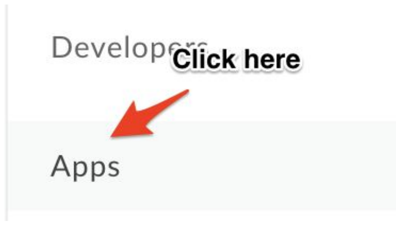
Note: You'll have to remove the Authorization header using the Assign Message policy because, the header might create a conflict in the target backend.

- **Save** the proxy and deploy it on the **test** environment.

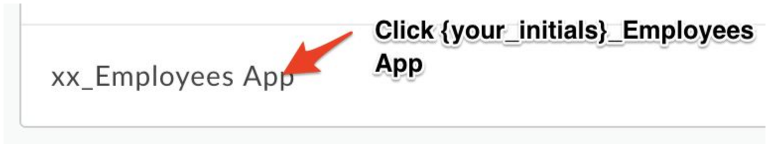


  Note: Make sure that the oauth proxy is also deployed. If not, deploy it to the test Environment.

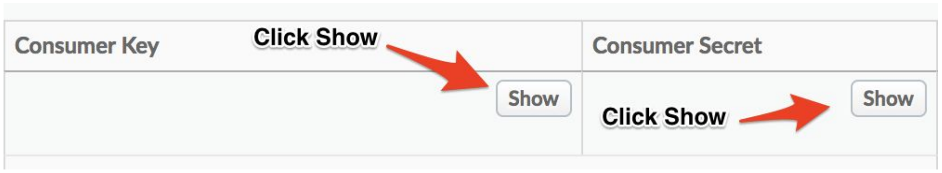
- *Congratulations!*...You've now successfully secured your APIs with OAuth 2.0
- Now, let's test it. To do that, we'd have to obtain the consumer key and secret for a particular app that is associated with a API Product containing the APIs that we created.
- Click **Publish > Apps** from the side navigation menu



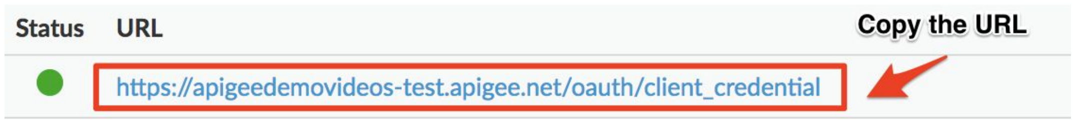
- Select the app that you created in the Publishing APIs lab



- Click on the show button under Consumer Key, Consumer Secret.
- Copy the values and store them somewhere safe

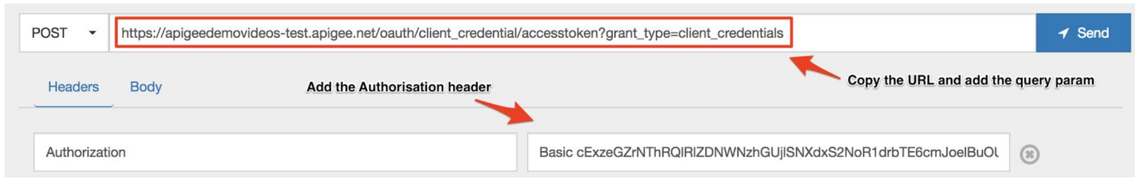


- Mac and Linux users, open Terminal and type the following command
  ```
  echo -n <consumer_key>:<consumer_secret> | base64
  ```
  or, refer this link to generate the value
- Now, let's test the deployment using the REST Client (https://apigee-rest-client.appspot.com/). Open the REST Client on a new browser window.
- Copy the URL for oauth API proxy.



https://apigeedemovideos-test.apigee.net/oauth/client_credential

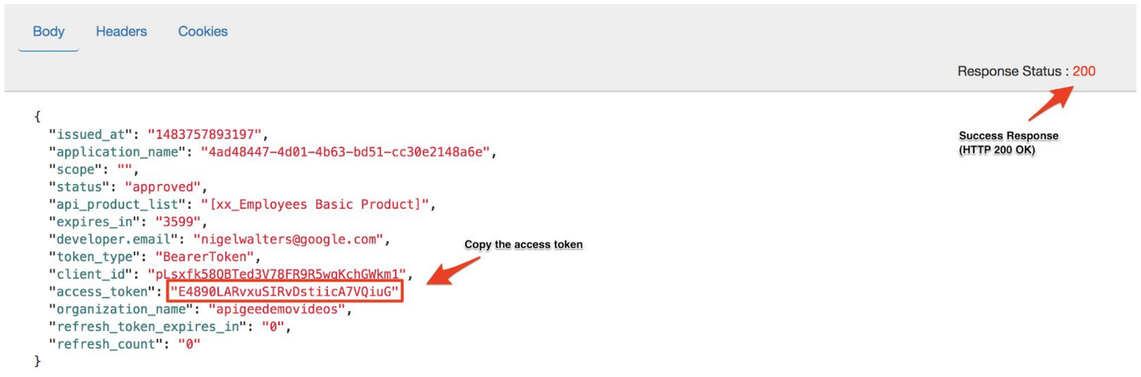
- First, you'll obtain an access token which will be used while fetching the employees list. To obtain an access token, you'll have to make a POST request to the `/oauth/client_credential/accesstoken` endpoint with a client credentials grant type as a query param and an Authorization header which is the base64 encoded value of consumer key and secret pair that was obtained previously.
  Query param: `grant_type=client_credentials`
  Header: `Authorization: Basic <base64 encoded value>`


POST
Send
Headers
Body
Add the Authorisation header
Copy the URL and add the query param

https://apigeedemovideos-test.apigee.net/oauth/client_credential/accesstoken?grant_type=client_credentials

Authorization: Basic cExzeGZrNThRQlRlZDNWNzhGUjlSNXdxS2NoR1drbTE6cmJoelBuOl

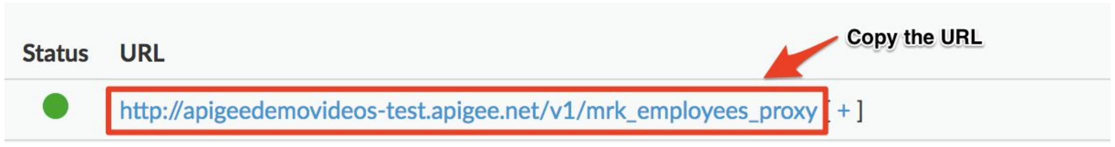
- Hit **Send** and you should see a response like this below. Then, copy the value for access token.



Response Status : 200

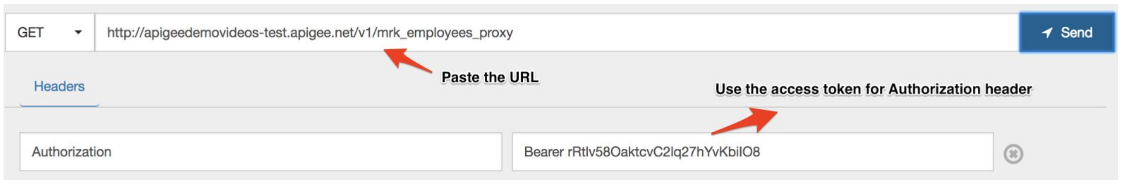
```
{
  "issued_at": "1483757893197",
  "application_name": "4ad48447-4d01-4b63-bd51-cc30e2148a6e",
  "scope": "",
  "status": "approved",
  "api_product_list": "[xx_Employees Basic Product]",
  "expires_in": "3599",
  "developer.email": "nigelwalters@google.com",
  "token_type": "BearerToken",
  "client_id": "pLsxfk58OBTed3V78FR9R5wqKchGWkm1",
  "access_token": "E4890LARvxuSIRvDstiicA7VQiuG"
  "organization_name": "apigeedemovideos",
  "refresh_token_expires_in": "0",
  "refresh_count": "0"
}
```

- Now, you should be able to get the employees list using the access token that we just obtained. Copy the URL for the proxy you created earlier in this lab.



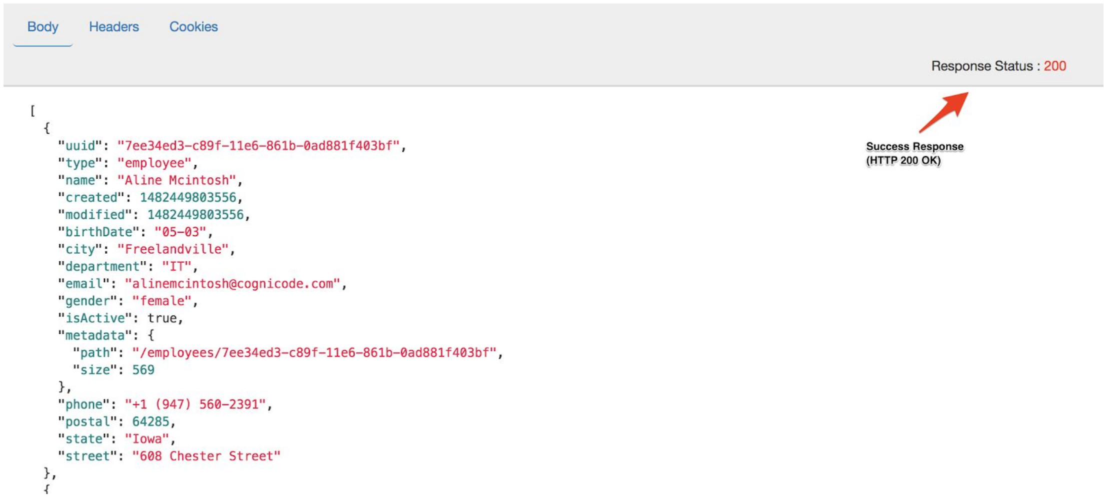
http://apigeedemovideos-test.apigee.net/v1/mrk_employees_proxy [+]

- Paste the URL in the Rest client, add the Authorization header and send a GET request . The value for Authorization header will be the access token that we obtained previously.
  `Authorization: Bearer <access_token>`



```
http://apigeedemovideos-test.apigee.net/v1/mrk_employees_proxy
Authorization    Bearer rRtlv58OaktcvC2lq27hYvKbilO8
```

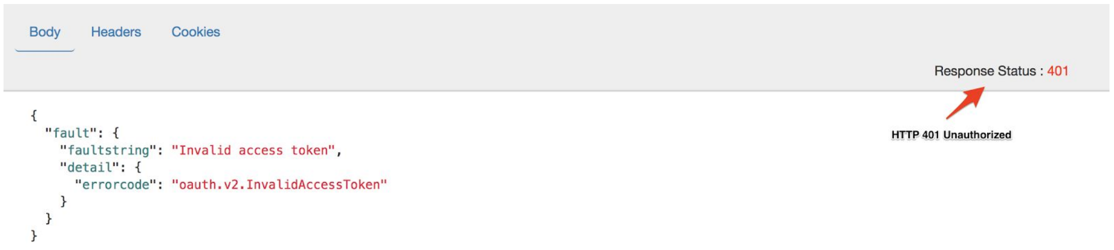
- Hit **Send** and you should see a response like this below.



Response Status : 200

```
[
  {
    "uuid": "7ee34ed3-c89f-11e6-861b-0ad881f403bf",
    "type": "employee",
    "name": "Aline Mcintosh",
    "created": 1482449803556,
    "modified": 1482449803556,
    "birthDate": "05-03",
    "city": "Freelandville",
    "department": "IT",
    "email": "alinemcintosh@cognicode.com",
    "gender": "female",
    "isActive": true,
    "metadata": {
      "path": "/employees/7ee34ed3-c89f-11e6-861b-0ad881f403bf",
      "size": 569
    },
    "phone": "+1 (947) 560-2391",
    "postal": 64285,
    "state": "Iowa",
    "street": "608 Chester Street"
  },
  {
```

- And, if you remove the Authrorization header and hit send, you will see a 401 Unauthorized status.



Response Status : 401

```
{
  "fault": {
    "faultstring": "Invalid access token",
    "detail": {
      "errorcode": "oauth.v2.InvalidAccessToken"
    }
  }
}
```

Lab Video

If you are lazy and don't want to implement this use case, it's OK. You can watch this short video to see how to implement 2 legged OAuth on Apigee Edge https://youtu.be/0pah5J7yQTQ

Earn Extra-points

Now that you’ve learned how to secure your API with OAuth 2.0, try to control the expiry of the access token that is generated.

Quiz

1. What are the various grant types?
2. What are the various operations that are provided by the OAuth v2.0 policy?

Summary

In this lab you learned how to secure your API using a two legged OAuth by using the default oauth proxy obtaining an access code and using that against your API.

References

- Link to Apigee docs page
  - OAuth 2.0: Configuring a new API proxy
    http://docs.apigee.com/api-services/content/understanding-default-oauth-20-configuration
  - Secure an API with OAuth
    http://docs.apigee.com/tutorials/secure-calls-your-api-through-oauth-20-client-credentials
- Link to Community posts and articles with topic as “OAuth 2.0”
- Search and Revoke tokens -
  https://community.apigee.com/articles/1571/how-to-enable-oauth-20-token-search-and-revocation.html

Rate this lab

How did you link this lab? Rate here.