Practical Exercise: Using Published APIs

Training Objective

In this section you will learn how to invoke, manage and control published APIs through the terminal using cURL.

Business Scenario

PizzaShack Limited needs to improve their delivery time in order to provide a better service. They want to use the Google Directions API to assist the delivery team to identify routes with traffic, find the best possible route and reduce delays in finding the customer's location. They have also decided to improve their PizzaShack web portal in order to call the Google Direction API via API Manager to show the best route information.

High Level Steps
- Create published API
- Publish new API
- Create new application
- Create new subscription

Detailed Instructions

Create Published API

1. Create the payload.json file in the <API-M_HOME>/bin folder with the following text and save.

   ```
   {
       "callbackUrl": "www.google.lk",
       "clientName": "rest_api_publisher",
       "tokenScope": "Production",
       "owner": "admin",
       "grantType": "password refresh_token",
       "saasApp": true
   }
   ```

2. Open a Command Line Interface.
3. Navigate to the {API-M_HOME/bin] folder using the command.
4. Give the cURL command for client registration. (Make sure the API Manager server is running before doing this. Also change 'true' to 'false' in the Analytics section inside the api-manager.xml file, if you are not using the Analytics server anymore)

```
curl -k -X POST -H "Authorization: Basic YWRtaW46YWRtaW4=" -H
"Content-Type: application/json" -d @payload.json
https://localhost:9443/client-registration/v0.17/register
```

Method : POST
URL : https://localhost:9443/client-registration/v0.17/register
Headers tab - Key 1: Content-Type , Value : application/json
Key 2: Authorization, Value : Basic "64encode admin:admin = YWRtaW46YWRtaW4="
Body tab - paste *payload.json* code and execute

A response similar to the following is displayed.

```
{"clientId":"v9ShQRLyDymel0ZUo3yGOHE0hUga","clientName":"rest_a
pi_publisher","callBackURL":"www.google.lk","clientSecret":"LWP
L8UFH3PUlhzc6gwamGciqcksa","isSaasApplication":true,"appOwner":
"admin","jsonString":"{\"grant_types\":\"password
refresh_token\",\"redirect_uris\":\"www.google.lk\",\"client_na
me\":\"rest_api_publisher\"}","jsonAppAttribute":"{}","tokenTyp
e":null}
```

5. Copy the clientId and clientSecret from the console and encode them to generate a key using https://www.base64encode.org/ or any other encoder.

Encode to Base64 format

Simply enter your data then push the encode button.

---

v9ShQRLyDymel0ZUo3yGOHE0hUga:LWPL8UFH3PUlhzc6gwamGciqcksa

ⓘ To encode binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

| UTF-8 ▾ | Destination character set. |
| LF (Unix) ▾ | Destination newline separator. |

☐ Encode each line separately (useful for multiple entries).

☐ Split lines into 76 character wide chunks (useful for MIME).

☐ Perform URL safe encoding (uses Base64URL format).

⬭ Live mode OFF   Encodes in real-time when you type or paste (supports only UTF-8 character set).

> ENCODE <   Encodes your data into the textarea below.

djlTaFFSTHlEeW1lbDBaVW8zeUdPSEUwaFVnYTpMV1BMOFVGSDNQVWxoemM2Z3dhbUdjaqXFja3Nh

Note : Add a colon (:) between the clientId and clientSecret on Base64.

6. Type the following authorization invocation cURL command on the terminal with the encoded clientId and clientSecret for the Authorization Basic value and scope=apim_create as the scope.

```
curl -k -d
"grant_type=password&username=admin&password=admin&scope=ap
im:api_create" -H "Authorization: Basic <encoded value
clientid:clientsecret>" https://127.0.0.1:8243/token
```

Method : POST
URL : https://127.0.0.1:8243/token
Headers tab - Key 1: Authorization, Value: Basic <encoded value of clientid:clientsecret>

Body tab - Key 1: grant_type, Value: password
Key 2: username, Value: admin, Key 3:password, Value:admin
Key 4: scope, Value: apim:api_create
Authorization tab - Inherit auth from parent

A response similar to the following is displayed.
```
{"access_token":"12b38de8-f68b-3042-a08e-d34333744067","refresh
_token":"1a6aa85d-0f16-3c85-9689-28f0d290fbd4","scope":"apim:ap
i_create","token_type":"Bearer","expires_in":3600}
```

Note : The scope is given depending on the requirement .A new token is required each
time a different scope is used and each token is valid only for 1 hour

7. Create the data.json file in the [API-M_HOME]/bin folder.
8. Add the following json to data.json and save

```json
{
  "policies": [
   "Unlimited"
  ],
  "visibility": "PUBLIC",
  "visibleRoles": [],
  "visibleTenants": [],
  "cacheTimeout": 300,
  "endpointConfig": {
   "endpoint_type": "http",
   "sandbox_endpoints": {
     "url": "http://maps.google.com/maps/api/directions/"
   },
   "production_endpoints": {
     "url": "http://maps.google.com/maps/api/directions/"
   }
  },
  "subscriptionAvailability": null,
  "subscriptionAvailableTenants": [],
  "destinationStatsEnabled": "Disabled",
  "operations": [
   {
     "id": "postapiresource",
     "target": "string",
     "verb": "POST",
     "authType": "string",
     "throttlingPolicy": "Unlimited",
     "scopes": [
```

```json
      "apim:api_view"
    ],
    "usedProductIds": [
      "string"
    ]
  }
],
"responseCachingEnabled": false,
"isDefaultVersion": true,
 "gatewayEnvironments": [
 "Production and Sandbox"
],
"businessInformation":    {
   "technicalOwner": "ApiCreator",
   "technicalOwnerEmail": "ApiCreator@pizzashack.com",
   "businessOwner": "ApiPublisher",
   "businessOwnerEmail": "ApiPublisher@pizzashack.com"
},
"transport":    [
   "http",
   "https"
],
"tags":    [
   "phone",
   "multimedia",
   "mobile"
],
"provider": "admin",
"version": "Beta",
"description": "Calculates directions between locations",
"name": "GoogleDirectionsAPI",
"context": "/googledirections"
}
```

9. Run the following cURL command to create the api using data.json. Type the access token obtained as the Authorization Bearer value.

```
curl -k -H "Authorization: Bearer <access token>" -H
"Content-Type: application/json" -X POST -d @data.json
https://127.0.0.1:9443/api/am/publisher/v1/apis
```

Method : POST
URL : https://127.0.0.1:9443/api/am/publisher/v1/apis

Authorization tab - Type : Inherit auth from parent
Header tab - key 1: Authorization - Bearer <access token>
Key 2: Content-Type - application/json
Body - raw: paste *data.json* file code

10. The response which includes the id of the API will be displayed.

```
{"id":"b9228a37-9b60-46eb-a908-a72bb56190b7","name":"Google
DirectionsAPI","description":"Calculates directions between
locations","context":"/googledirections","version":"Beta","
provider":"admin","lifeCycleStatus":"CREATED","wsdlInfo":nu
ll,"wsdlUrl":null,"testKey":null,"responseCachingEnabled":f
alse,"cacheTimeout":300,"destinationStatsEnabled":null,"has
Thumbnail":null,"isDefaultVersion":true,"enableSchemaValida
tion":false,"enableStore":true,"type":"HTTP","transport":["
http","https"],"tags":["multimedia","phone","mobile"],"poli
cies":["Unlimited"],"apiThrottlingPolicy":null,"authorizati
onHeader":"Authorization","securityScheme":["oauth2","oauth
_basic_auth_api_key_mandatory"],"maxTps":null,"visibility":
"PUBLIC","visibleRoles":[],"visibleTenants":[],"endpointSec
urity":null,"gatewayEnvironments":["Production and
Sandbox"],"deploymentEnvironments":[],"labels":[],"mediatio
nPolicies":[],"subscriptionAvailability":"CURRENT_TENANT","
subscriptionAvailableTenants":[],"additionalProperties":{},
"monetization":null,"accessControl":"NONE","accessControlRo
les":[],"businessInformation":{"businessOwner":"ApiPublishe
r","businessOwnerEmail":"ApiPublisher@pizzashack.com","tech
nicalOwner":"ApiCreator","technicalOwnerEmail":"ApiCreator@
pizzashack.com"},"corsConfiguration":{"corsConfigurationEna
bled":false,"accessControlAllowOrigins":["*"],"accessContro
lAllowCredentials":false,"accessControlAllowHeaders":["auth
orization","Access-Control-Allow-Origin","Content-Type","SO
APAction","apikey","testKey"],"accessControlAllowMethods":[
"GET","PUT","POST","DELETE","PATCH","OPTIONS"]},"workflowSt
atus":null,"createdTime":"2020-09-07
23:13:26.041","lastUpdatedTime":"2020-09-07
23:13:26.331","endpointConfig":{"endpoint_type":"http","san
dbox_endpoints":{"url":"http://maps.google.com/maps/api/dir
ections/"},"production_endpoints":{"url":"http://maps.googl
```

```
e.com/maps/api/directions/"}},"endpointImplementationType":
"ENDPOINT","scopes":[],"operations":[{"id":"","target":"str
ing","verb":"POST","authType":"Application & Application
User","throttlingPolicy":"Unlimited","scopes":[],"usedProdu
ctIds":[],"amznResourceName":null,"amznResourceTimeout":nul
l}],"threatProtectionPolicies":null,"categories":[],"keyMan
agers":["all"]}
```

11. Refresh https://localhost:9443/publisher/ and the GoogleDirectionAPI will be displayed on the dashboard.
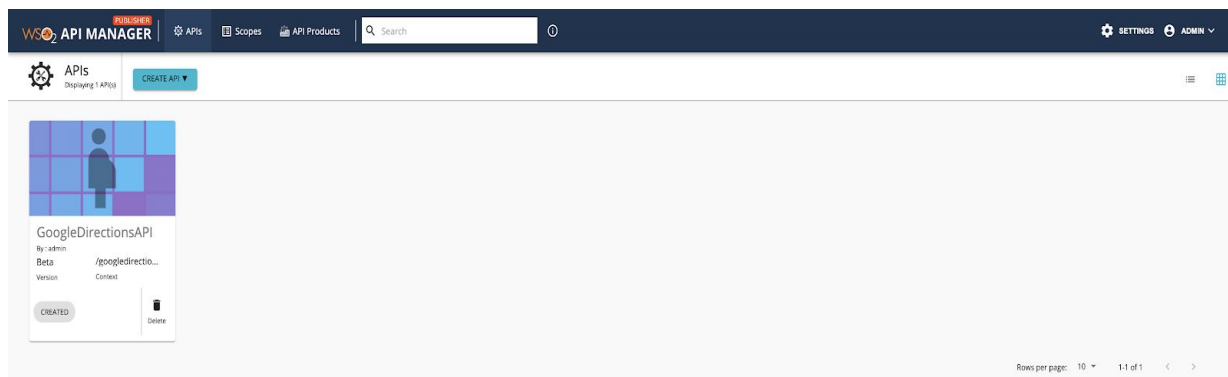
Publish API

1. Log in as admin to https://localhost:9443/publisher.
2. Click on GoogleDirectionsAPI and select the **Lifecycle** tab. The lifecycle will be indicated as **Created**.
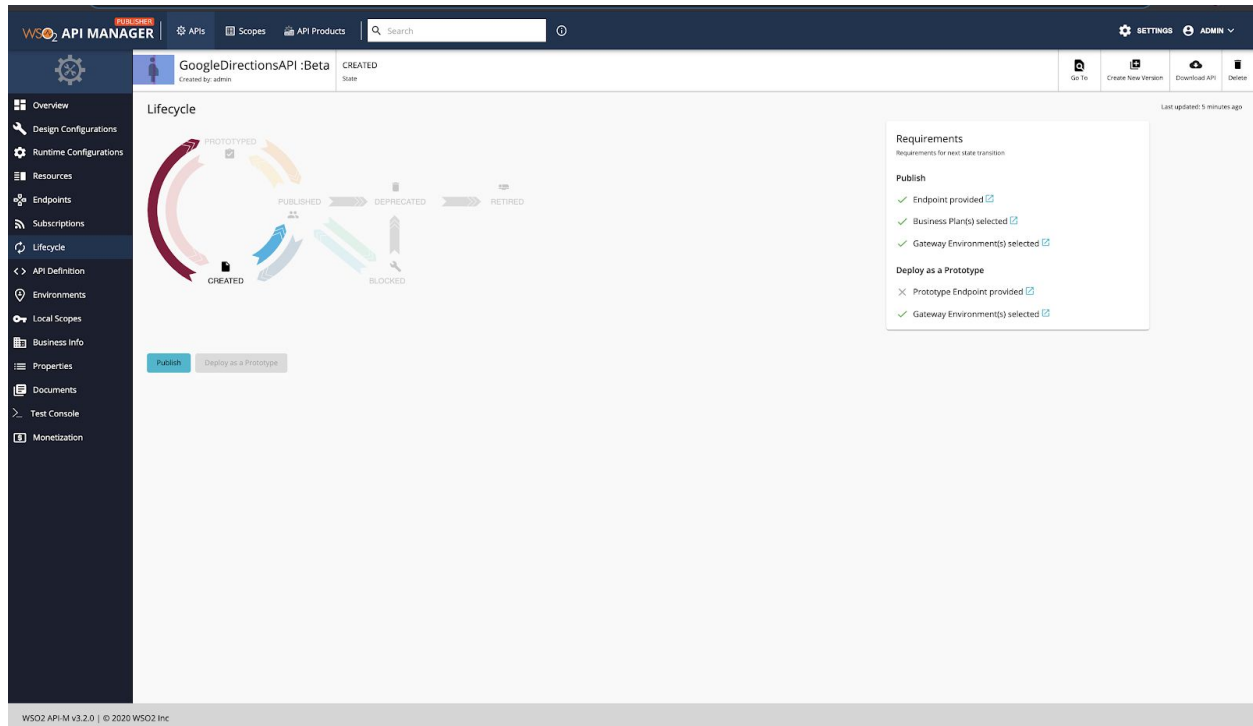
3. Go to the terminal and invoke a new authorization token using the following cURL command.with the previously encoded string as the Authorization Basic value and scope=apim_publish.

```
curl -k -d
"grant_type=password&username=admin&password=admin&scope=apim:api_publish
" -H "Authorization: Basic <encoded value of clientid:clientsecret>"
https://127.0.0.1:8243/token
```

Method : POST
URL : https://127.0.0.1:8243/token
Headers tab - Key 1: Authorization, Value: Basic <encoded value of clientid:clientsecret>
Body tab - Key 1: grant_type, Value: password

Key 2: username, Value: admin, Key 3:password, Value:admin
Key 4: scope, Value: apim:api_publish
Authorization tab - Inherit auth from parent

A response similar to the following is displayed.
```
{"access_token":"d90dcb86-3bec-323f-98a2-2494cd03b0c9","refresh
_token":"3a6a26df-f240-3f65-88bd-7dcc5055b934","scope":"apim:ap
i_publish","token_type":"Bearer","expires_in":3600}
```

4. Type the following cURL command to publish the API. **Modify the Authorization Bearer token with the generated access token,** and "**apiId**" with the id of the GoogleDirectionsAPI which can be found in the json response retrieved when the API is created.

    ```
    curl -k -H "Authorization: Bearer <access token>" -X POST
    "https://127.0.0.1:9443/api/am/publisher/v1/apis/change-lifecycle?apiId=b9
    228a37-9b60-46eb-a908-a72bb56190b7&action=Publish"
    ```

    Method : POST
    URL:https://127.0.0.1:9443/api/am/publisher/v1/apis/change-lifecycle?apiId=<**input apiId here**>&action=Publish
    Query Params tab - key 1:apiId, value:<id of api>
    Key 2: action, value: Publish
    Authorization tab - inherit auth from parent
    Header tab - key 1:Authorization, value: Bearer <access token generated previously>

5. Go to the Publisher and refresh. Now the status of the GoogleDirectionsAPI will be displayed as **Published**.

Create New Application

1. Log in as admin to the Devportal ([https://localhost:9443/devportal/) and click **carbon.super** on the dashboard. The GoogleDirectionsAPI icon is visible.
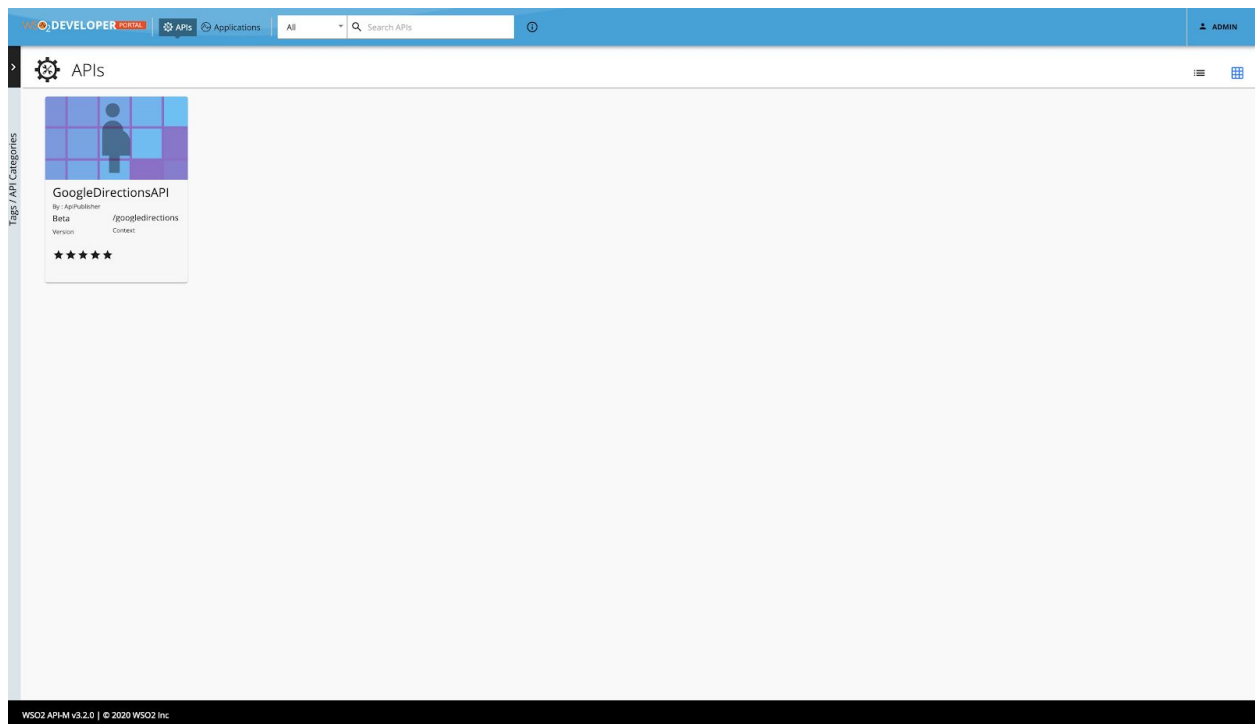
2. Open a Command Line Terminal.
3. Modify the [API HOME]/bin/payload.json file clientName to rest_api_devportal and save;

```
{
    "callbackUrl": "www.google.lk",
    "clientName": "rest_api_devportal",
    "tokenScope": "Production",
    "owner": "admin",
    "grantType": "password refresh_token",
    "saasApp": true
}
```

4. Open a Command Line Interface and type the following cURL command for client registration.

```
curl -k -X POST -H "Authorization: Basic YWRtaW46YWRtaW4=" -H
"Content-Type: application/json" -d @payload.json
https://localhost:9443/client-registration/v0.17/register
```

Method : Post
URL : https://localhost:9443/client-registration/v0.17/register
Headers tab - Key 1: Content-Type , Value : application/json
Key 2: Authorization, Value : Basic "64encode admin:admin - YWRtaW46YWRtaW4="
Body tab - paste payload.json code and execute

5. Encode the client ID and secret values as before.
6. Invoke the token endpoint using the following cURL command. Replace the Authorization Basic value.

```
curl -k -d
"grant_type=password&username=admin&password=admin&scope=apim:subscri
be apim:app_manage" -H "Authorization: Basic <64 encoded value>"
https://127.0.0.1:8243/token
```

Method : POST
URL : https://127.0.0.1:8243/token
Headers tab - Key 1: Authorization, Value: Basic <encoded value of clientid:clientsecret>
Body tab - Key 1: grant_type, Value: password
Key 2: username, Value: admin, Key 3:password, Value:admin
Key 4: scope, Value: apim:subscribe
Authorization tab - Inherit auth from parent

A response similar to the following is displayed.
```
{"access_token":"1d4b3517-ea53-3b74-a213-324854b035a7","refresh
_token":"05fc5468-601b-3321-8387-ea928c4748e9","scope":"apim:ap
p_manage
apim:subscribe","token_type":"Bearer","expires_in":2271}
```

7. Remove the content in the [API-M_HOME]/bin/data.json file and add the following:
```
{
  "name": "GoogleDirectionsApp",
  "throttlingPolicy": "Unlimited",
```

```
   "description": "GoogleDiractionsAPI App",
   "tokenType": "JWT",
   "status": "APPROVED",
   "subscriptionCount": 0,
   "keys": [],
   "subscriptionScopes": [],
   "owner": "admin",
   "hashEnabled": true
}
```

8. Run the following cURL command to create an application. Replace the Authorization Bearer value with the access token generated above.

```
curl -k -H "Authorization: Bearer
1d4b3517-ea53-3b74-a213-324854b035a7" -H "Content-Type:
application/json" -X POST -d @data.json
"https://127.0.0.1:9443/api/am/store/v1/applications"
```

Method : POST
URL : https://127.0.0.1:9443/api/am/store/v1/applications
Authorization tab - Type : Inherit auth from parent
Header tab - key 1: Authorization - Bearer <access token>
Key 2: Content-Type - application/json
Body - raw: paste *data.json* file code

A response similar to the following is displayed.
```
{"applicationId":"fef71d1b-3c75-40a8-aa9d-bc769dbb2bca","name":
"GoogleDirectionsApp","throttlingPolicy":"Unlimited","descripti
on":"GoogleDiractionsAPI
App","tokenType":"JWT","status":"APPROVED","groups":[],"subscri
ptionCount":0,"keys":[],"attributes":{},"subscriptionScopes":[]
,"owner":"admin","hashEnabled":null}
```

9. The created application for GoogleDirectionsApp will be listed under **Applications** in the Devportal.

Create New Subscription

1. Invoke a new authorization token using the following cURL command. Replace the Authorization Basic value with the encoded string.

```
curl -k -d
"grant_type=password&username=admin&password=admin&scope=ap
im:subscribe" -H "Authorization: Basic <base64 encoded
string>" https://127.0.0.1:8243/token
```

Method : POST
URL : https://127.0.0.1:8243/token
Headers tab - Key 1: Authorization, Value: Basic <encoded value of clientid:clientsecret>
Body tab - Key 1: grant_type, Value: password
Key 2: username, Value: admin, Key 3:password, Value:admin
Key 4: scope, Value: apim:subscribe
Authorization tab - Inherit auth from parent

A response similar to the following is displayed.

{"access_token":"b73c656e-4f88-3444-8b74-770600ed4ae4","refresh
_token":"a2726a12-bf28-3e3d-869e-1a7e8dd8e514","scope":"apim:su
bscribe","token_type":"Bearer","expires_in":3600}

2. Retrieve the list of applications using the following cURL command. Replace the Authorization Bearer value.

```
curl -k -H "Authorization: Bearer
b73c656e-4f88-3444-8b74-770600ed4ae4"
"https://127.0.0.1:9443/api/am/store/v1/applications"
```

Method : GET
URL : https://127.0.0.1:9443/api/am/store/v1/applications
Authorization tab - Type : Inherit auth from parent
Headers tab - Key 1: Authorization, Value: Bearer <access token>

A response similar to the following is displayed.
{"count":2,"list":[{"applicationId":"cd3c3233-6fab-4d11-b624-9f
9daddfc6b2","name":"DefaultApplication","throttlingPolicy":"Unl
imited","description":"This is the default
application","status":"APPROVED","groups":[],"subscriptionCount
":0,"attributes":{},"owner":"admin"},{"applicationId":"fef71d1b
-3c75-40a8-aa9d-bc769dbb2bca","name":"GoogleDirectionsApp","thr
ottlingPolicy":"Unlimited","description":"GoogleDiractionsAPI
App","status":"APPROVED","groups":[],"subscriptionCount":0,"att
ributes":{},"owner":"admin"}],"pagination":{"offset":0,"limit":
25,"total":2,"next":"","previous":""}}

3. Retrieve the list of APIs using the following cURL command. Replace the Authorization Bearer value.

```
curl -k -H "Authorization: Bearer
c5b8debf-7281-3792-8e7b-fb96936fdca9"
https://127.0.0.1:9443/api/am/store/v1/apis
```

Method : GET
URL : https://127.0.0.1:9443/api/am/store/v1/apis
Authorization tab - Type : Inherit auth from parent

Headers tab - Key 1: Authorization, Value: Bearer <access token>

A response similar to the following is displayed.

```
{"count":1,"list":[{"id":"b9228a37-9b60-46eb-a908-a72bb56190b7"
,"name":"GoogleDirectionsAPI","description":"Calculates
directions between
locations","context":"/googledirections","version":"Beta","type
":"HTTP","provider":"admin","lifeCycleStatus":"PUBLISHED","thum
bnailUri":null,"avgRating":"0.0","throttlingPolicies":["Unlimit
ed"],"advertiseInfo":{"advertised":false,"originalStoreUrl":nul
l,"apiOwner":"admin"},"businessInformation":{"businessOwner":"A
piPublisher","businessOwnerEmail":"ApiPublisher@pizzashack.com"
,"technicalOwner":"ApiCreator","technicalOwnerEmail":"ApiCreato
r@pizzashack.com"},"isSubscriptionAvailable":true,"monetization
Label":"FREE"}],"pagination":{"offset":0,"limit":25,"total":1,"
next":"","previous":""}}
```

4. Replace the text in the [API-M_HOME]/bin/data.json file with the following. Give the retrieved apiId and applicationId.

```
{
        "throttlingPolicy": "Unlimited",
        "status": "UNBLOCKED",
        "apiId": "b9228a37-9b60-46eb-a908-a72bb56190b7",
        "applicationId": "fef71d1b-3c75-40a8-aa9d-bc769dbb2bca"
}
```

5. Type the following cURL command to create a new subscription replacing the Authorization Bearer value.

```
curl -k -H "Authorization: Bearer d1a167e580e40a8a2ae297fc4656677c" -H
"Content-Type: application/json" -X POST  -d @data.json
"https://127.0.0.1:9443/api/am/store/v1/subscriptions"
```

Method : POST
URL : https://127.0.0.1:9443/api/am/store/v1/subscriptions
Authorization tab - Type : Inherit auth from parent
Header tab - key 1: Authorization - Bearer <access token>
Key 2: Content-Type - application/json
Body - raw: paste new data.json file code

A response similar to the following is displayed.

```
{"subscriptionId":"43d2bb84-d039-48a8-b75d-71dc398912aa","appli
cationId":"fef71d1b-3c75-40a8-aa9d-bc769dbb2bca","apiId":"b9228
a37-9b60-46eb-a908-a72bb56190b7","apiInfo":{"id":"b9228a37-9b60
-46eb-a908-a72bb56190b7","name":"GoogleDirectionsAPI","descript
ion":"Calculates directions between
locations","context":"/googledirections","version":"Beta","type
":null,"provider":"admin","lifeCycleStatus":"PUBLISHED","thumbn
ailUri":null,"avgRating":"0.0","throttlingPolicies":[],"adverti
seInfo":{"advertised":false,"originalStoreUrl":null,"apiOwner":
"admin"},"businessInformation":{"businessOwner":"ApiPublisher",
"businessOwnerEmail":null,"technicalOwner":null,"technicalOwner
Email":null},"isSubscriptionAvailable":true,"monetizationLabel"
:null},"applicationInfo":{"applicationId":"fef71d1b-3c75-40a8-a
a9d-bc769dbb2bca","name":"GoogleDirectionsApp","throttlingPolic
y":"Unlimited","description":"GoogleDiractionsAPI
App","status":"APPROVED","groups":[],"subscriptionCount":1,"att
ributes":{},"owner":"admin"},"throttlingPolicy":"Unlimited","re
questedThrottlingPolicy":"Unlimited","status":"UNBLOCKED","redi
rectionParams":null}
```

6. Go to the Devportal and click **APPLICATIONS.**

7. Select the GoogleDirectionsApp from the list. Select the **Subscriptions** tab. There will be a subscription with an Unlimited Subscription Tier to GoogleDirectionsAPI.