

# Mulesoft API

Hands-on session

17 Sep 2021

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**<https://github.com/nhanngo/mule-training/tree/master/cbt>**

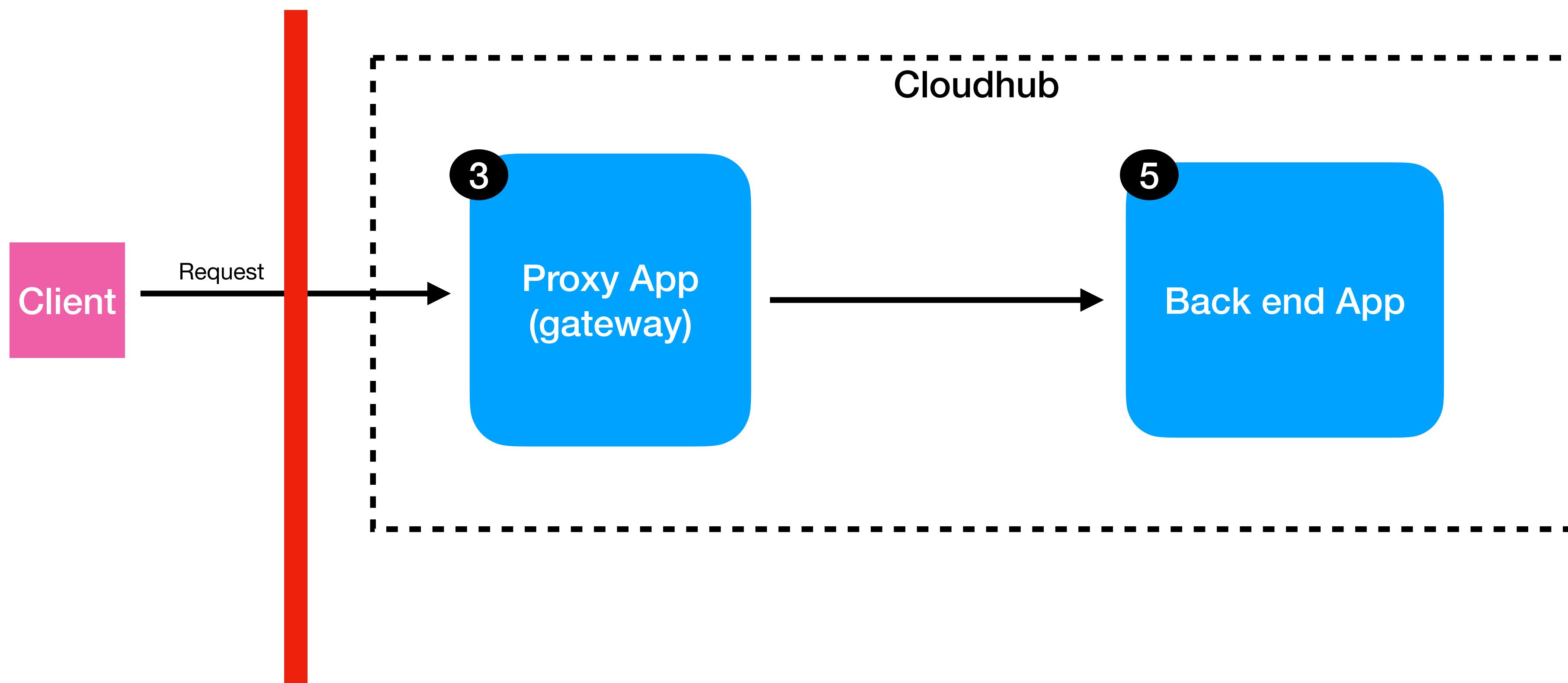
The screenshot shows the Anypoint Platform interface with several sections visible:

- Design Center**: A section with a red circle containing the number 1. It includes a "Start designing" button and a "Tutorials" box with a "Getting started with MuleSoft - Hello Mule" link.
- DataGraph**: A section featuring a blue hexagonal icon and the text "Unify many APIs into a single graph of data, and consume exactly the data you need in a single request." It has a "Unify & consume" button.
- Exchange**: A section with a red circle containing the number 2. It includes a "Discover & share" button.
- Management Center**: A section with a red circle containing the number 3. It includes links for "Access Management", "API Manager", "Runtime Manager", and "Visualizer".
- Visualizer**: A section with a red circle containing the number 4.

The browser address bar shows the URL: `anypoint.mulesoft.com/home/organizations/3394af49-c1e7-46`.

## Scenario #1 - Hello API

1. Go to “Design Center” to write API specification (RAML)
2. Publish API specification on “Exchanges”
3. Go to “API Manager” to deploy “Proxy App”
4. Use “Anypoint Studio” to develop “Back end App”, export to .jar file
5. Go to “Runtime Manager” to deploy “Back end App”
6. Apply simple basic authentication for “Proxy App”



<https://github.com/nhanngo/mule-training/blob/master/cbt/helloapi.jar>

≡  Design Center

# Projects

Filter by project name

 Filter ▾

+ Create new

Name	Project Type	Last Update	Created By
helloapi	API specification	September 15th, 2021	nhannt01

anypoint.mulesoft.com/designcenter/designer/#/project/3d886

API designer raml-examples/helloworld.raml at master · raml-org/raml-examples · GitHub

## Design Center

Saved a few seconds ago

Files +

Filter exchange.json helloapi.raml Root file :

```
1 #%RAML 1.0
2 title: helloAPI
3
4 version: 1.0
5
6 /hello:
7   get:
8     responses:
9       200: # HTTP status code
10      body:
11        application/json:
12          example:
13            {
14              "message": "Hello world"
15            }
16
17   post:
18     body:
19       application/json:
20         properties:
21           user: string
22           passwd: string
23         example:
24           {
25             user: "nhan",
26             passwd: "&%(#)Xtdt"
27           }
```

Documentation API title: helloAPI Version: 1.0

API endpoints /hello GET POST

helloapi Asset version (required) 1.0.0 API version (required) 1.0 Specified in root file > More options

?

Publish

Documentation API title: helloAPI Version: 1.0 Publish to Exchange

This project has not been published to Exchange yet.

Asset versioning To publish to Exchange, you must version assets using SemVer. Examples of good versions are 1.0.0 or 4.3.1.

Additional help • [Changing a project's main/root file](#) • [What is an API version?](#)

Cancel Publish to Exchange

API Manager

API Administration (Sandbox)

SANDBOX

Manage API v

Manage API from Exchange

API Administration

API Groups New

Create new API

Add a new API by uploading RAML/OAS/SOAP definition or new HTTP asset

Import

Add a new API by importing an existing exported API configuration zip file

API Manager

API Administration (Sandbox) Get from Exchange

SANDBOX

Manage API from Exchange

Manage an existing Exchange asset

API Manager

API Administration (Sandbox) Get from Exchange

SANDBOX

Manage API from Exchange

API Configurations

API name: helloapi

Asset type: RAML/OAS

API version: 1.0

Asset version: 1.0.0

Managing type: Endpoint with Proxy

Proxy deployment target: CloudHub

Mule version: Mule 4 Recommended

Implementation URI: http://api.com

TLS Context for outbound traffic:

Path: /

Advanced options

Proxy version: 3.1.0

For more information on different proxy versions please visit this [page](#)

Enable Console:  Enable the Console Flow in the autogenerated proxy.

Console Path: /console/\*

Validations:  Validate the inbound requests against the provided specification.

Strict validations (optional)

Query params:

Scheme:  HTTP  HTTPS

endpoint of back-end app

**API Manager**

API Administration (Sandbox) helloapi (1.0) - Settings

SANDBOX

Requests Top Apps Latency

Include Policy Violations 1h 3h 1d 7d 1m 3m

No data available

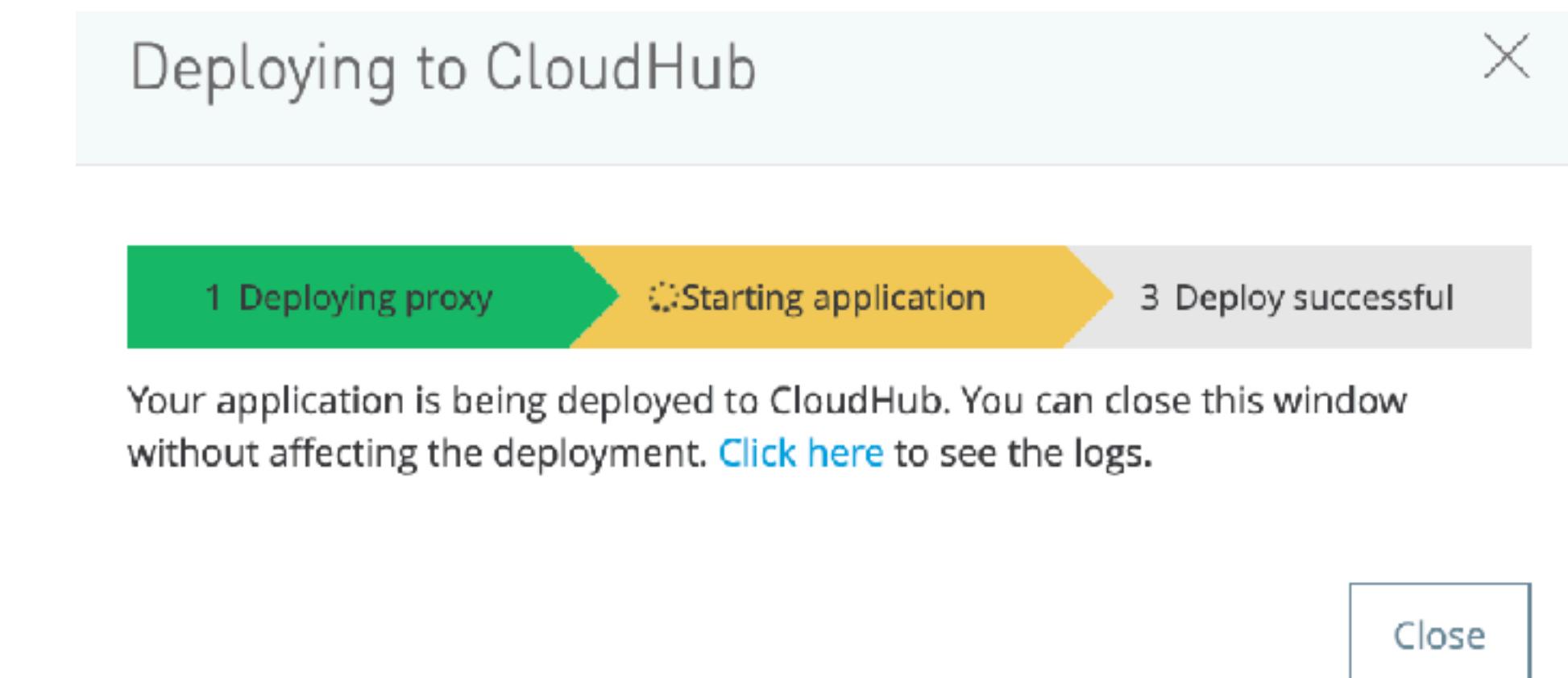
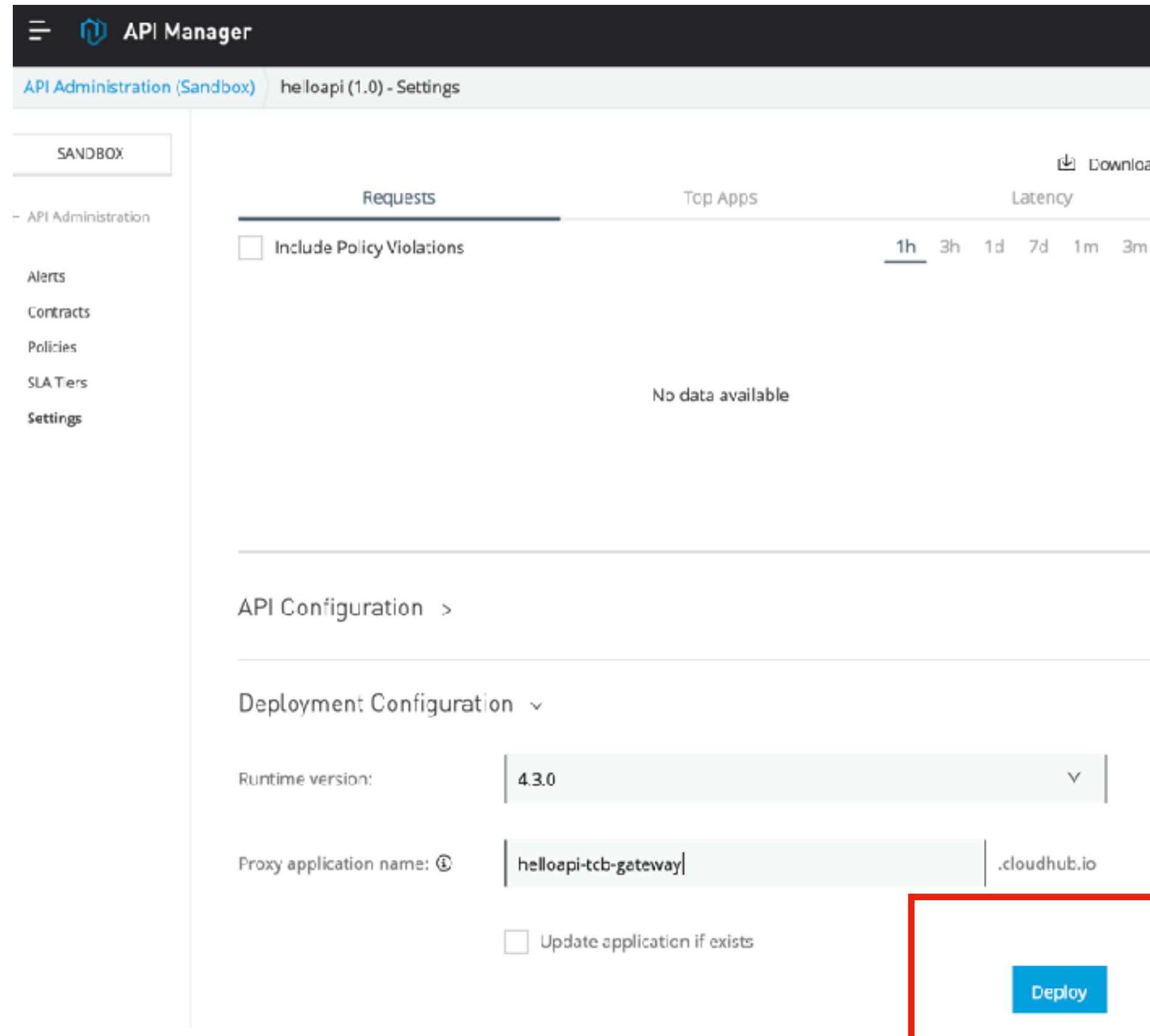
API Configuration >

Deployment Configuration

Runtime version: 4.3.0

Proxy application name: helloapi-tcb-gateway .cloudbhub.io

Update application if exists Deploy



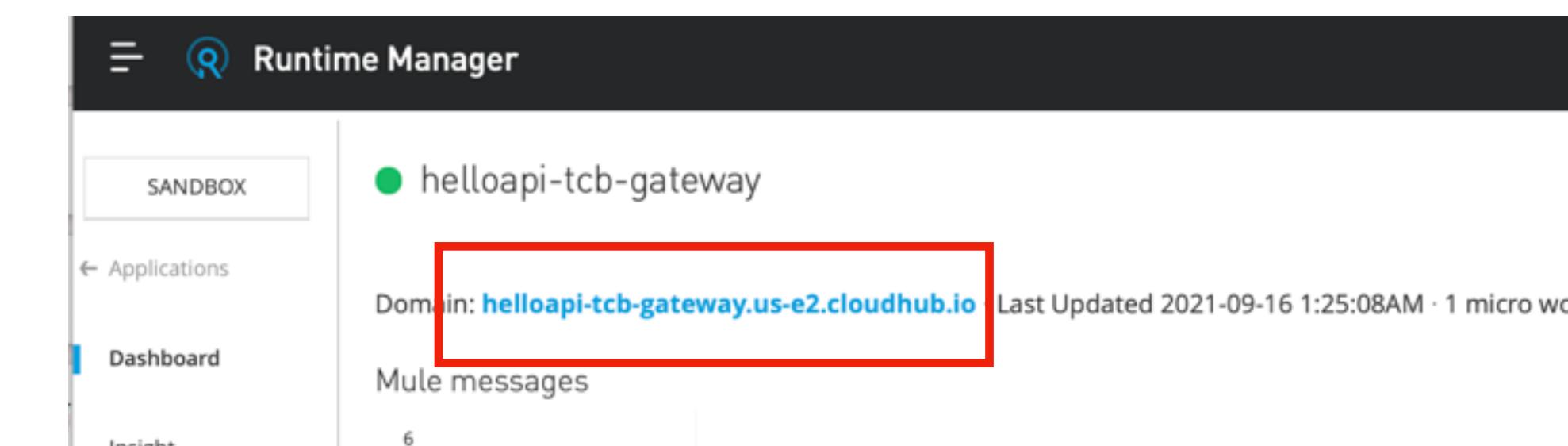
**Runtime Manager**

SANDBOX Applications Dashboard Insight

helloapi-tcb-gateway

Domain: [helloapi-tcb-gateway.us-e2.cloudbhub.io](#) Last Updated 2021-09-16 1:25:08AM · 1 micro worker

Mule messages 6



**Runtime Manager**

SANDBOX Applications Servers Alerts VPCs Load Balancers

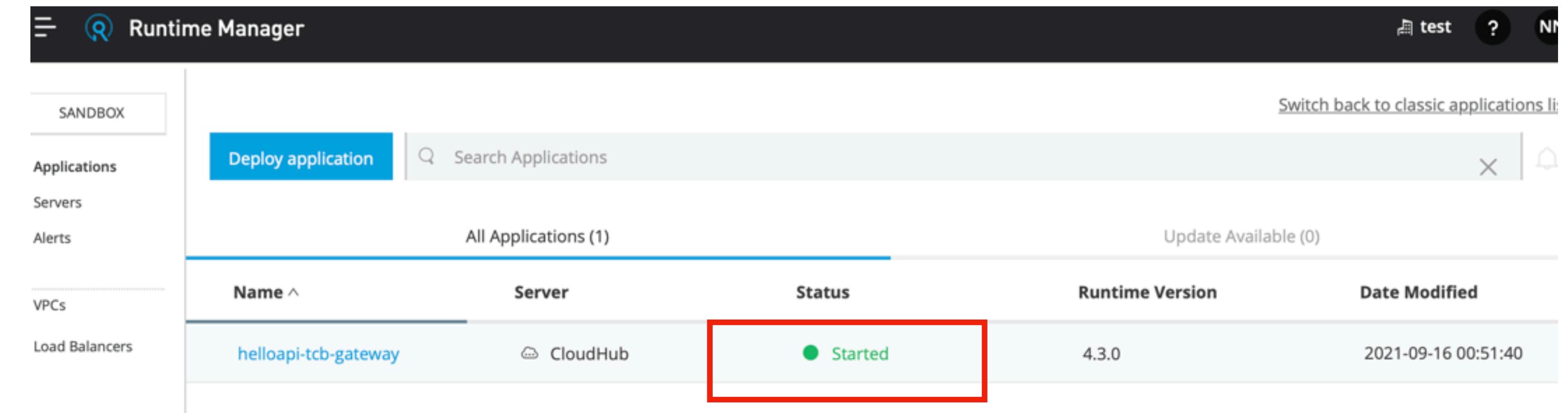
Deploy application Search Applications

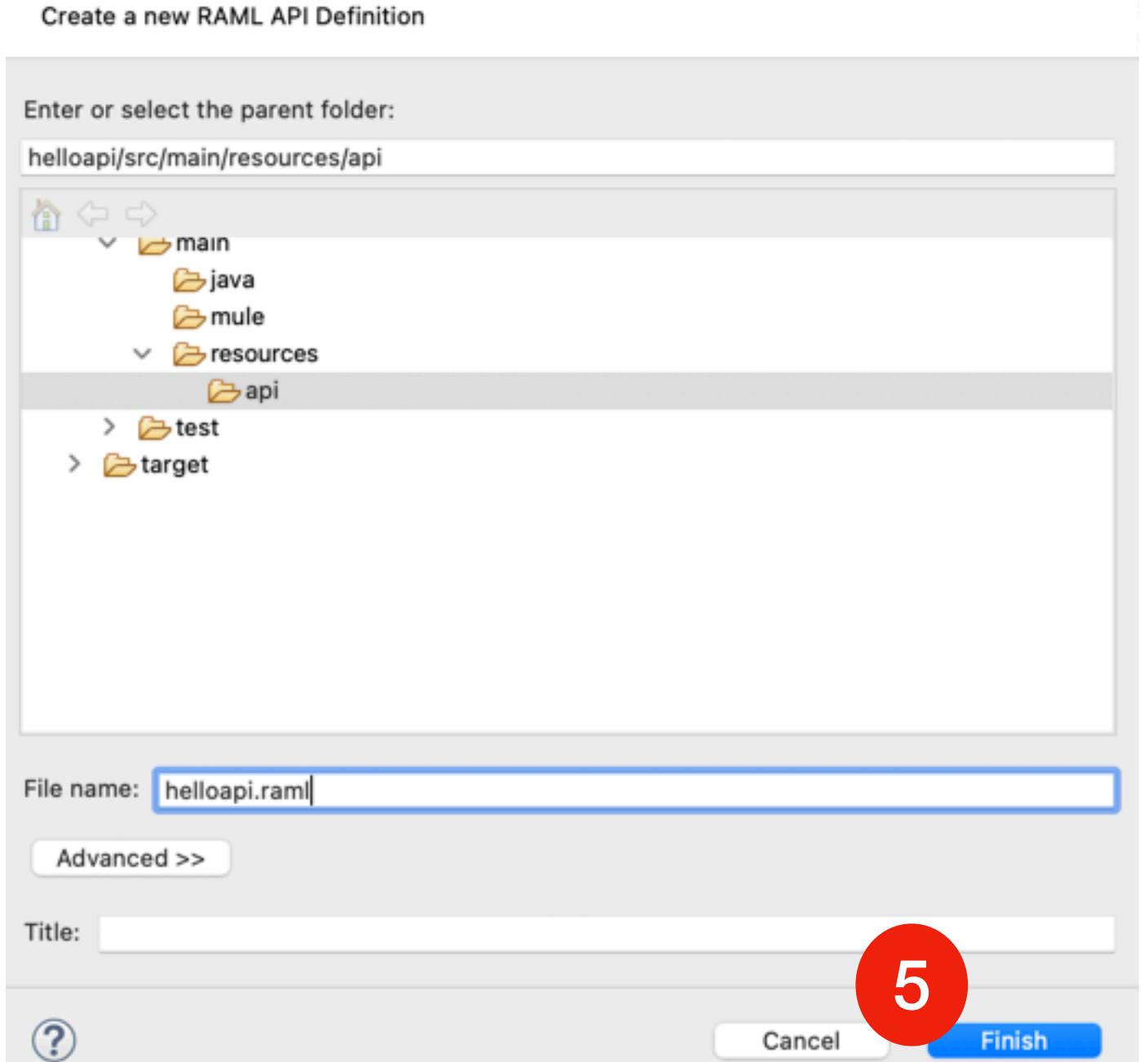
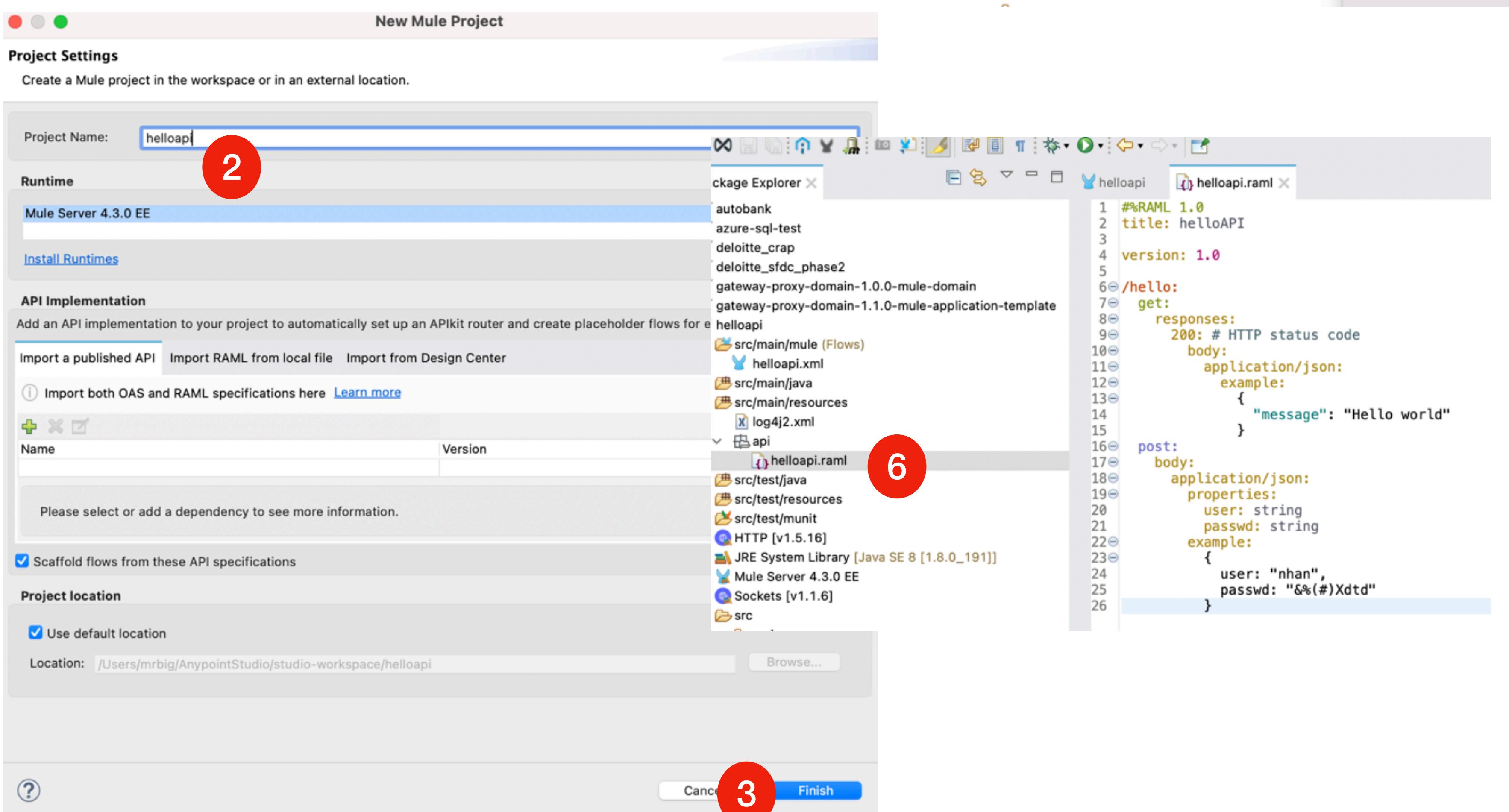
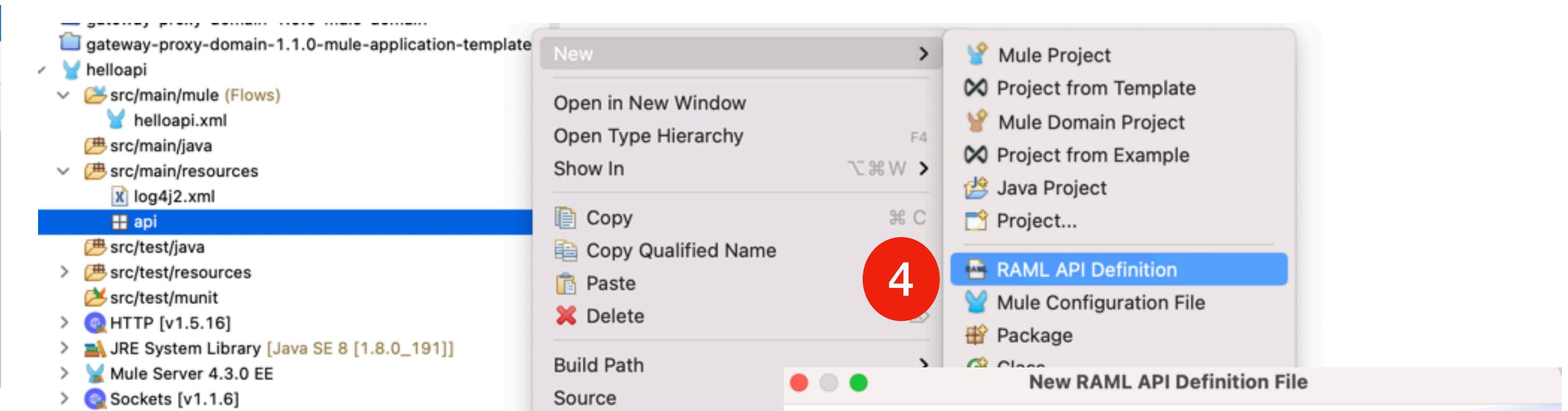
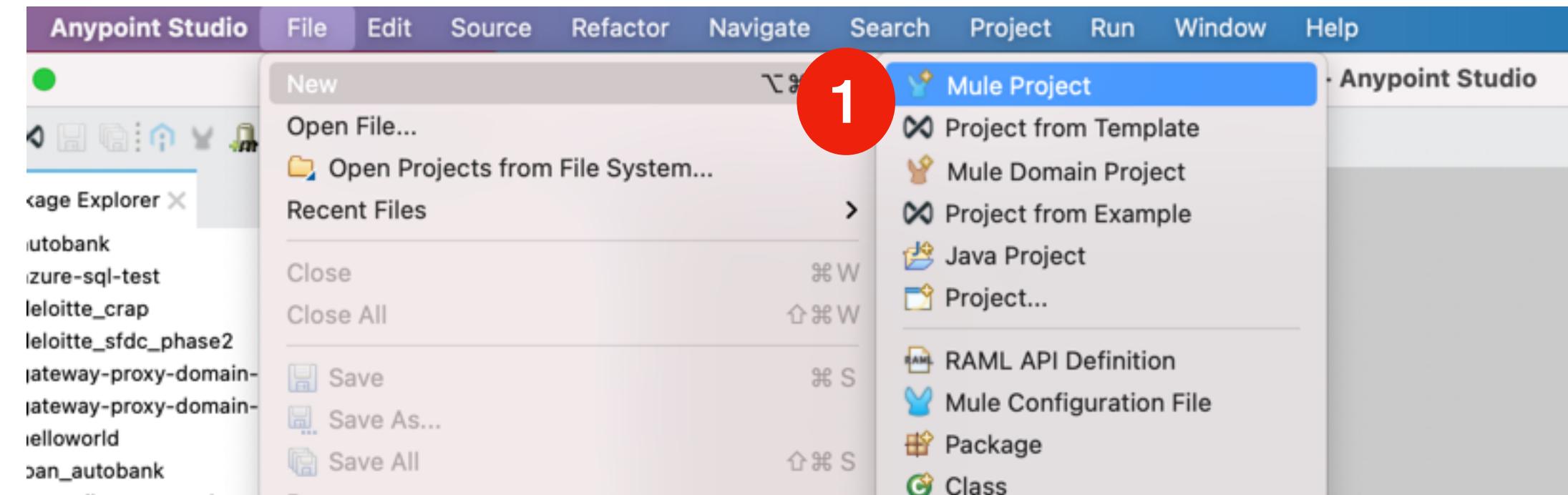
All Applications (1)

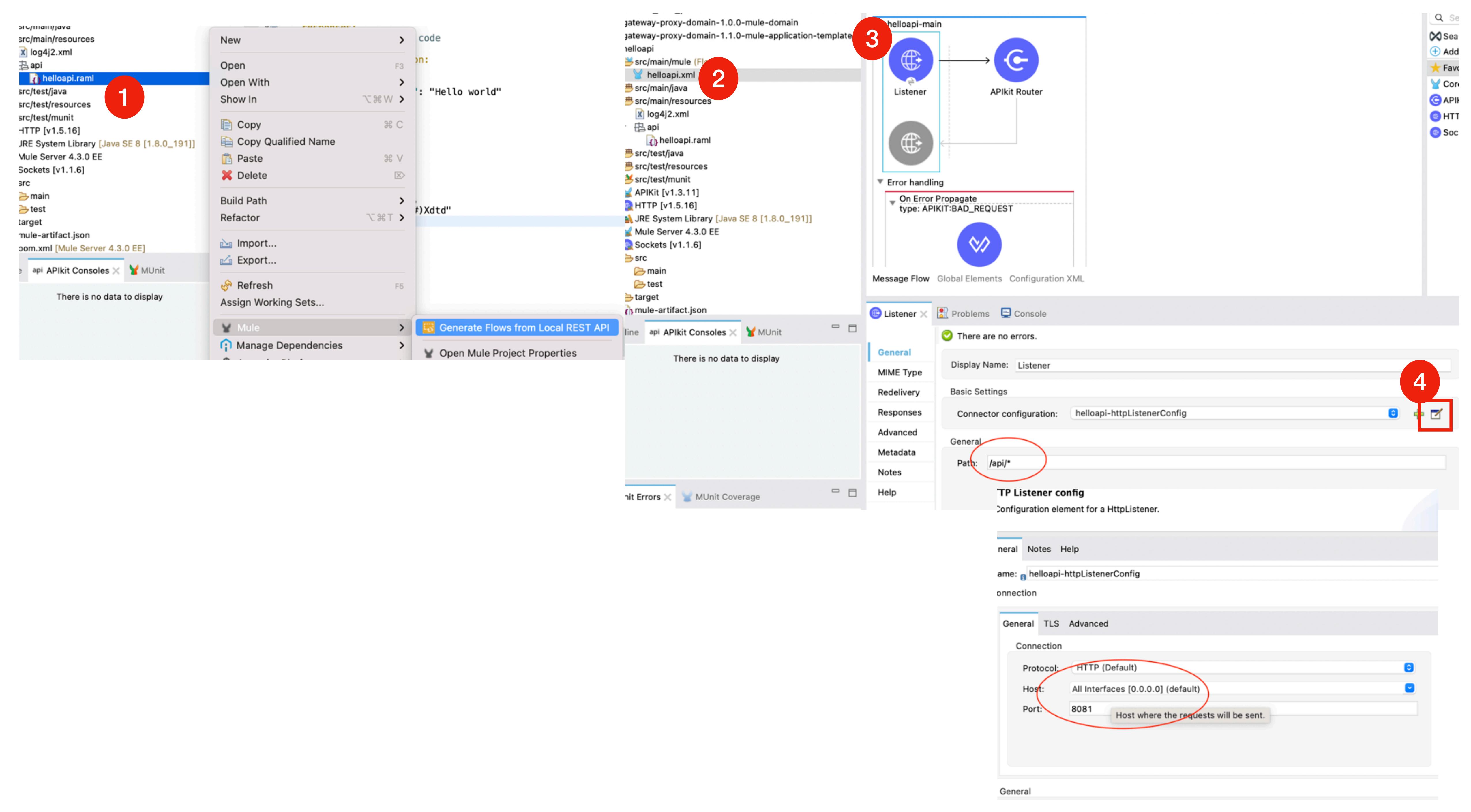
Update Available (0)

Name ^	Server	Status	Runtime Version	Date Modified
helloapi-tcb-gateway	CloudHub	Started	4.3.0	2021-09-16 00:51:40

[Switch back to classic applications list](#)







studio-workspace - helloapi

General Mule Debug... Arguments JRE Environment Common

Mule projects to launch

- 1 test\_azure\_service\_bus (1)
- 2 test\_azure\_service\_bus
- 3 vinfest-yanadms-integration
- 4 sample-encrypt-payload-mule-4.2.2
- 5 vinfest-battery-vehicle-check
- 6 test-async
- 7 vinhome\_demo\_api
- 8 sap\_rfc\_test
- 9 helloworld
- 10 vfs\_battery\_integration\_1.0.2

Run As

Run Configurations... (highlighted with red box)

Organize Favorites...

SE 8 [1.8.0\_191]

Maven command line arguments

<enter command line configuration parameters>

Force check for updated releases and snapshots on remote repositories

Command: mvn clean package -nsu -DskipMunitTests

Revert Apply

\*\*\*\*\*  
INFO 2021-09-16 01:11:18,204 [WrapperListener\_start\_runner] [processor: ; event: ] org.mule.runtime.core.internal.log  
\*\*\*\*\*  
\* Application: helloapi \*  
\* OS encoding: UTF-8, Mule encoding: UTF-8 \*  
\* \*  
\*\*\*\*\*  
INFO 2021-09-16 01:11:18,220 [WrapperListener\_start\_runner] org.mule.runtime.core.internal.logging.LogUtil:  
\*\*\*\*\*  
+ Mule is up and kicking (every 5000ms) +  
\*\*\*\*\*  
INFO 2021-09-16 01:11:18,318 [WrapperListener\_start\_runner] org.eclipse.jetty.server.AbstractConnector: Started S  
INFO 2021-09-16 01:11:18,328 [WrapperListener\_start\_runner] org.mule.runtime.core.internal.logging.LogUtil:  
\*\*\*\*\*  
\* -- + DOMAIN + -- \* -- + STATUS + -- \*  
\*\*\*\*\*  
\* default \* DEPLOYED \*  
\*\*\*\*\*  
\*\*\*\*\*  
\* -- + APPLICATION + -- \* -- + DOMAIN + -- \* -- + STATUS + -- \*  
\*\*\*\*\*  
\* helloapi \* default \* DEPLOYED \*  
\*\*\*\*\*

GET http://localhost:8081/api/hello (highlighted with red box)

Params Authorization Headers (7) Body Pre-request Script Tests Settings

Query Params

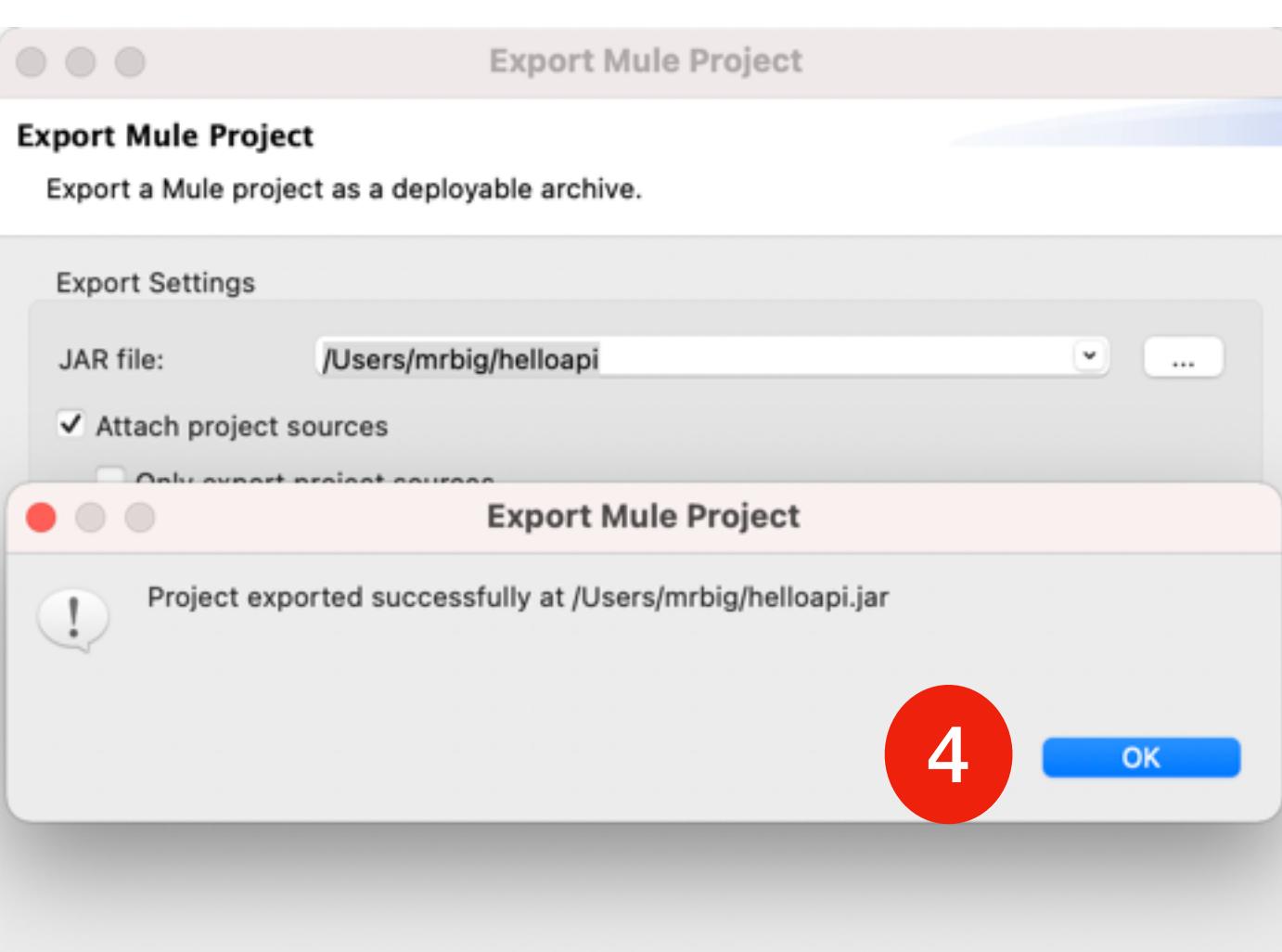
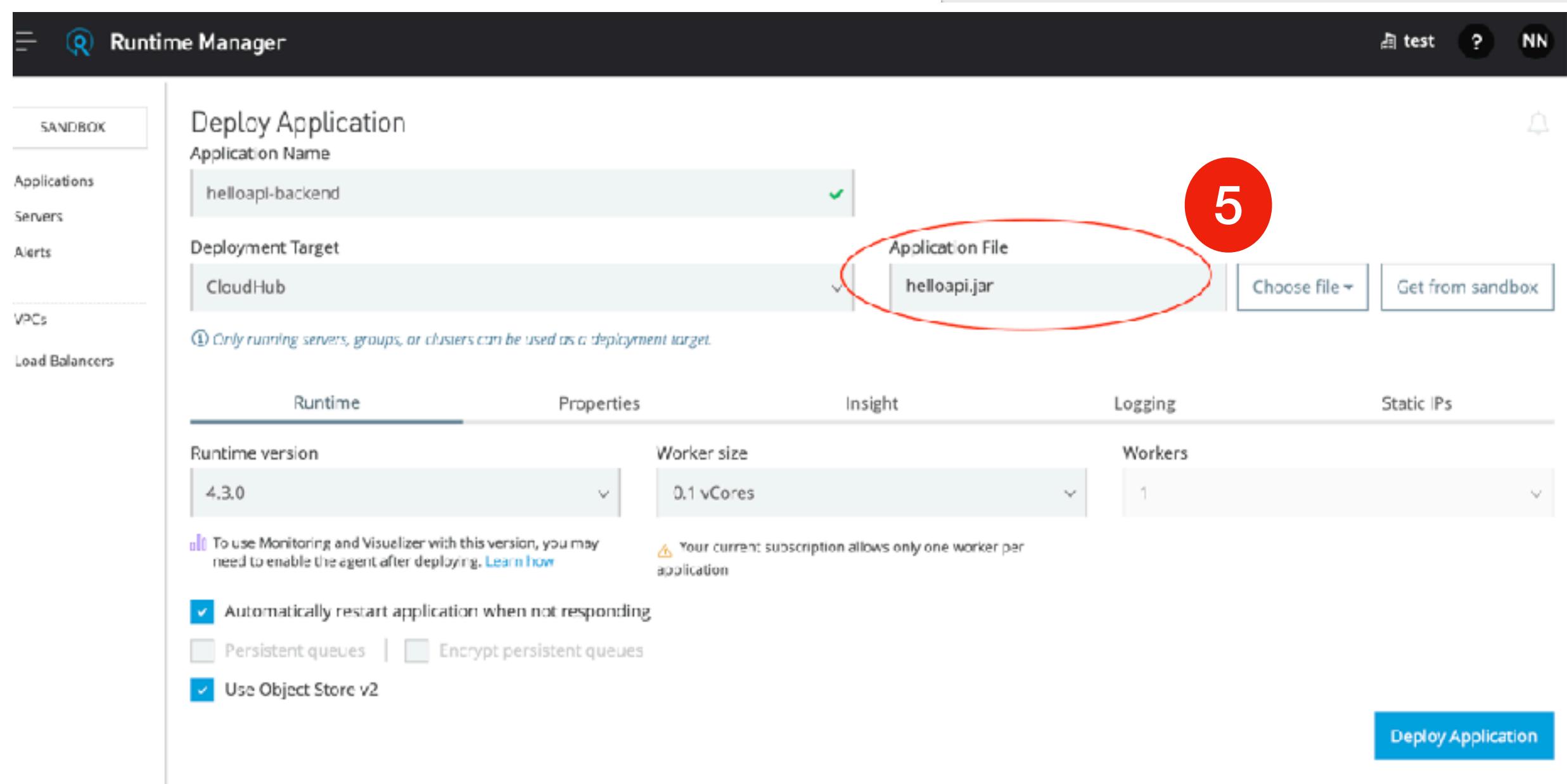
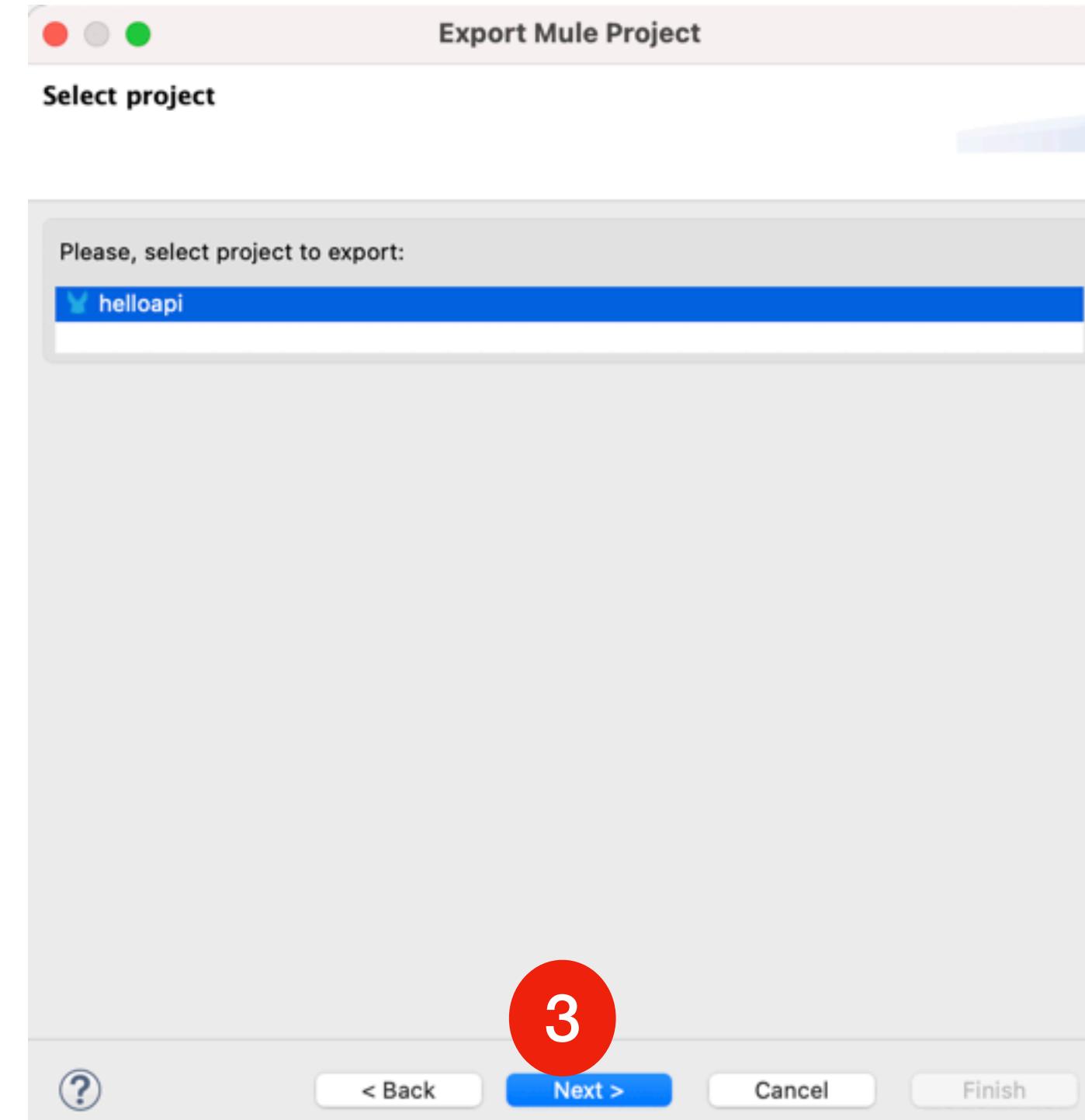
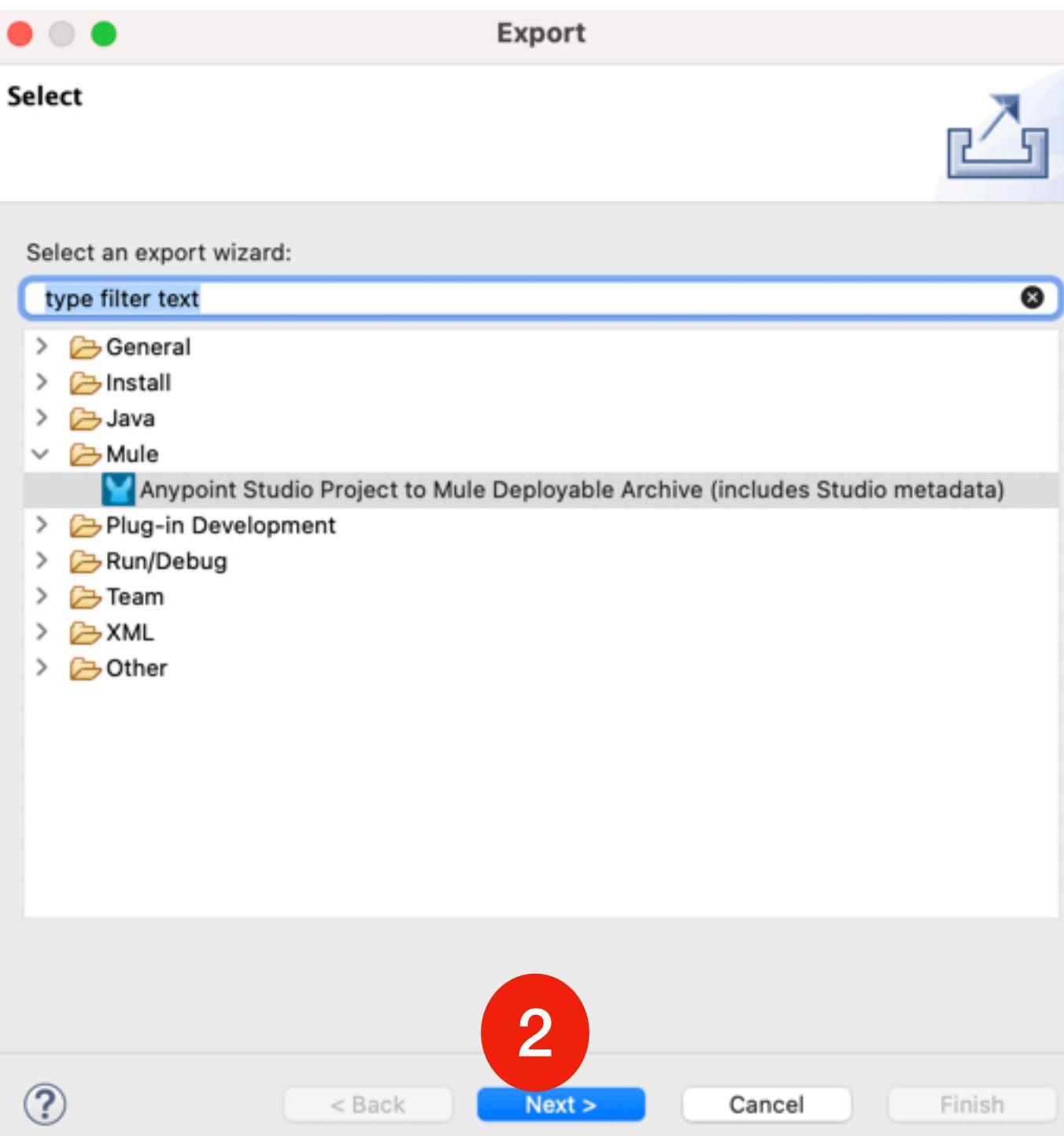
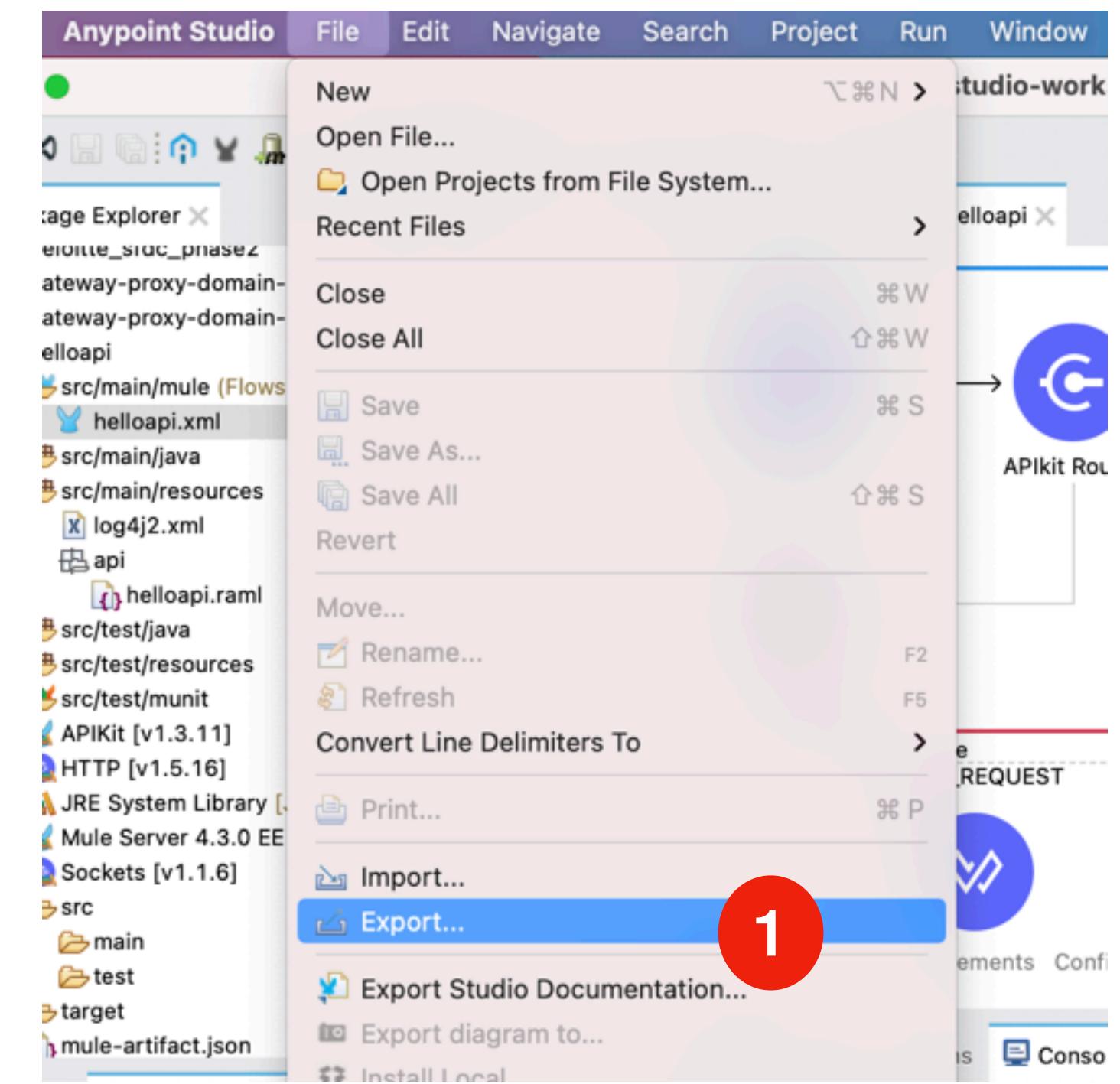
KEY	VALUE	DESCRIPTION
Key	Value	Description

Body Cookies Headers (3) Test Results

Status: 200 OK Time: 657 ms

Pretty Raw Preview Visualize JSON

```
1 {  
2   "message": "Hello world"  
3 }
```



**SANDBOX**

**Deploy application** |  Search Applications | X | L

[Switch back to classic applications](#)

All Applications (2) | Update Available (0)

Name ^	Server	Status	Runtime Version	Date Modified
helloapi-backend	CloudHub	Started	4.3.0	2021-09-16 01:17:31

**Runtime Manager**

**SANDBOX**

Applications

Dashboard

Insight

Logs

Object Store

Queues

Schedules

Settings

1

helloapi-backend

Domain: [helloapi-backend.us-e2.cloudhub.io](http://helloapi-backend.us-e2.cloudhub.io) · Last Updated 2021-09-16 1:17:31AM · 1 micro worker, using

Mule messages

8  
7  
6  
5  
4  
3  
2  
1  
0

04:36:59  
Mule Messages 0

03:06:59 05:36:59 08:06:59 10:36:59 13:06:59 15:36:59

**Update back-end app endpoint in “proxy app”**

Mule version:

- Mule 4 Recommended
- Mule 3 or below

Your proxy is already deployed, to change this setting please remove the application from Cloudhub

2

Implementation URI:

+ Add TLS Context Used to secure outbound traffic

TLS Context for outbound traffic:

Path: /

Advanced options >

Save

Deployment Configuration

Runtime version: 4.3.0

Proxy application name: helloapi-tcb-gateway .cloudhub.io

3

Redeploy

The screenshot shows the Postman interface with a successful API call. The request method is 'GET' and the URL is 'http://helloapi-tcb-gateway.us-e2.cloudhub.io/hello'. The 'Headers' tab is selected, showing one header: 'Key' with 'Value'. The response status is '200 OK' with a time of 336 ms and a size of 192 B. The response body is a JSON object with a single key 'message' containing the value 'Hello world'.

GET http://helloapi-tcb-gateway.us-e2.cloudhub.io/hello

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

Headers (7 hidden)

	KEY	VALUE	DESCRIPTION	...	Bulk Edit	Presets
	Key	Value	Description			

Body Cookies Headers (5) Test Results

Status: 200 OK Time: 336 ms Size: 192 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {  
2   "message": "Hello world"  
3 }
```

**It works...but the gateway is naked, let's add a security policy for this proxy app - simple basic authentication !!!**

**1** API Manager

API Administration (Sandbox) helloapi (1.0) - Policies

SANDBOX

helloapi 1.0

API Status: Active Asset Version: 1.0.0 Latest Type: RAML/OAS

Implementation URL: <http://helloapi-backend.us-e2.cloudhub.io/api/>

+ Add consumer endpoint

Mule runtime version: 4.3.0-20210823

**Automated Policies**

There are no automated policies applied for the selected runtime version.

**2** API level policies

Apply New Policy

**3**

Select Policy

Security All Mule Versions

Policies Min Mule Version

- > Detokenization You need permission to apply this policy. [Learn more](#)
- > OAuth 2.0 access token enforcement using Mule OAuth provider
- > Basic authentication - Simple
- > IP allowlist
- > IP blacklist
- > IP blocklist
- > IP whitelist
- > JSON threat protection
- > JWT Validation

Cancel Configure Policy

**4**

API Manager

API Administration (Sandbox) helloapi (1.0) - Policies Apply Basic authentication - Simple policy

SANDBOX

Apply Basic authentication - Simple policy

Enforces HTTP Basic authentication according to the details configured in the policy.

User Name \* tcbtrainer

User Password \* .....  
Method & Resource conditions  
 Apply configurations to all API methods & resources  
 Apply configurations to specific methods & resources

Cancel Apply

**5**

GET http://helloapi-tcb-gateway.us-e2.cloudhub.io/hello

Params Authorization Headers (7) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

This request does not have a body

Status: 401 Unauthorized Time: 363 ms Size: 394 B

Body Cookies Headers (6) Test Results

Pretty Raw Preview Visualize JSON

```
1 {  
2   "error": "Registered authentication is set to HTTP basic authentication but there was no security context on"  
3 }
```

GET ▼ http://helloapi-tcb-gateway.us-e2.cloudbu.io/hello

Params Authorization ● Headers (8) Body Pre-request Script Tests Settings

Type Basic Auth ▼

The authorization header will be automatically generated when you send the request.

[Learn more about authorization ↗](#)

Username tcbtrainer

Password timenot4fun  Show Password

Body Cookies Headers (5) Test Results 🌐 Status: 200 OK Time: 322 ms Size: 192 B

Pretty Raw Preview Visualize JSON ▼ ≡

```
1 {  
2   "message": "Hello world"  
3 }
```



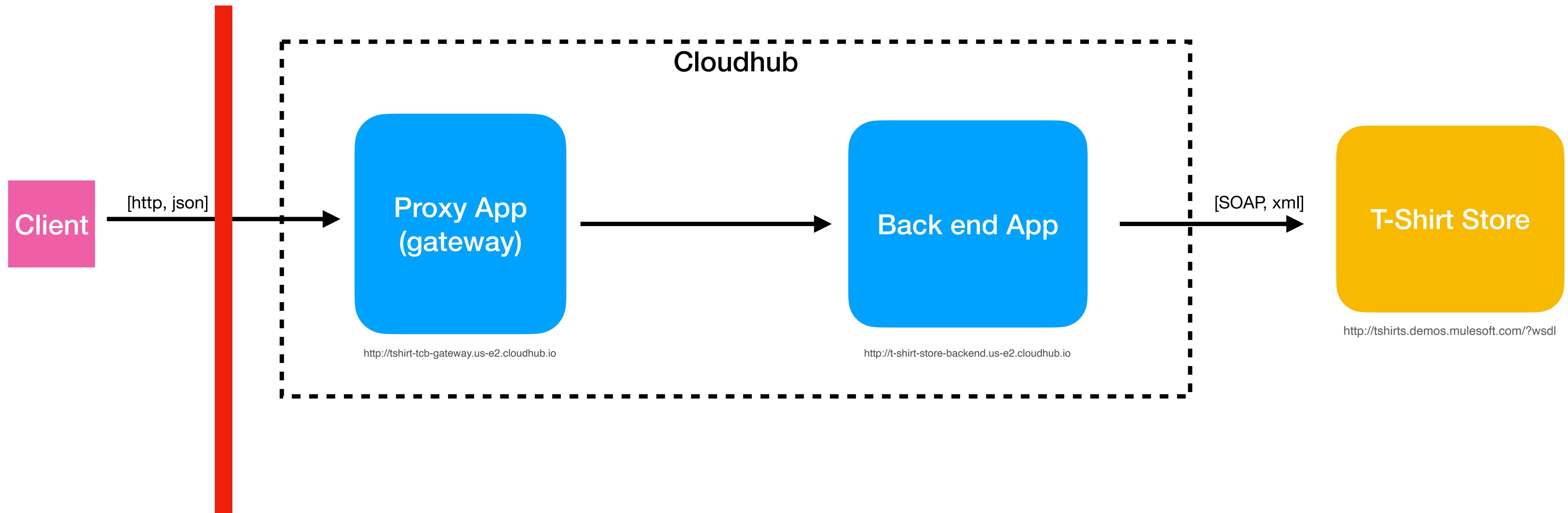
**problem?**

## Scenario #2 - WebService Consumer

**Proxy-app:** rewrite API specification

**Back-end app:** add flow to consume Web services exposed by T-shirt store

<https://github.com/nhanngo/mule-training/blob/master/cbt/tshirt-demo.jar>



## Design Center

## Projects

 Filter by project name

Filter ▾

+ Create new

Name	Project Type	Last Update	Created By
T-shirt store	API specification	September 15th, 2021	nhannt01
halloapi	API specification	September 15th, 2021	nhannt01

## Design Center

few seconds ago

T-shirt store/master

## Files


 Filter

exchange.json



t-shirt-store.raml

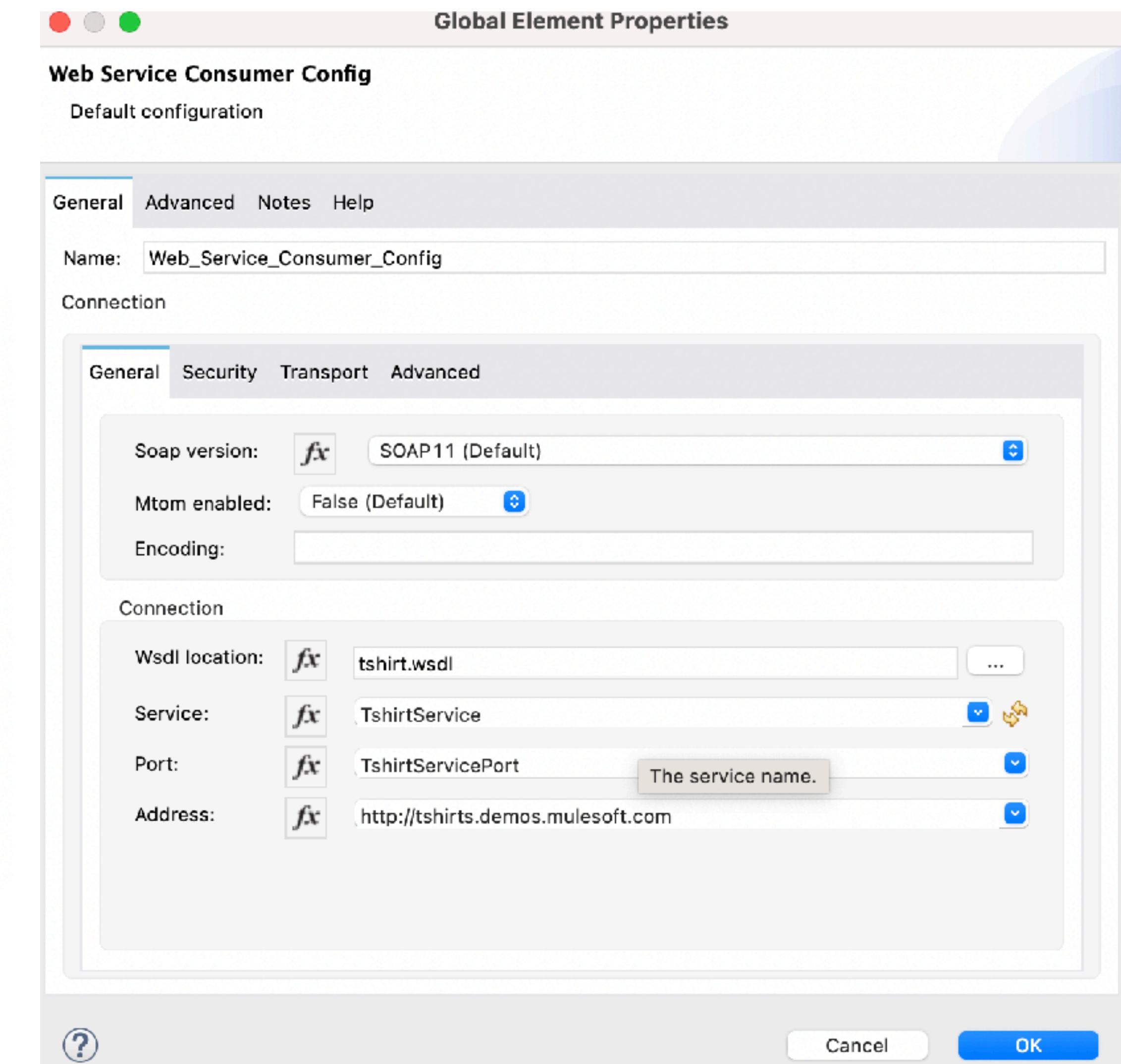
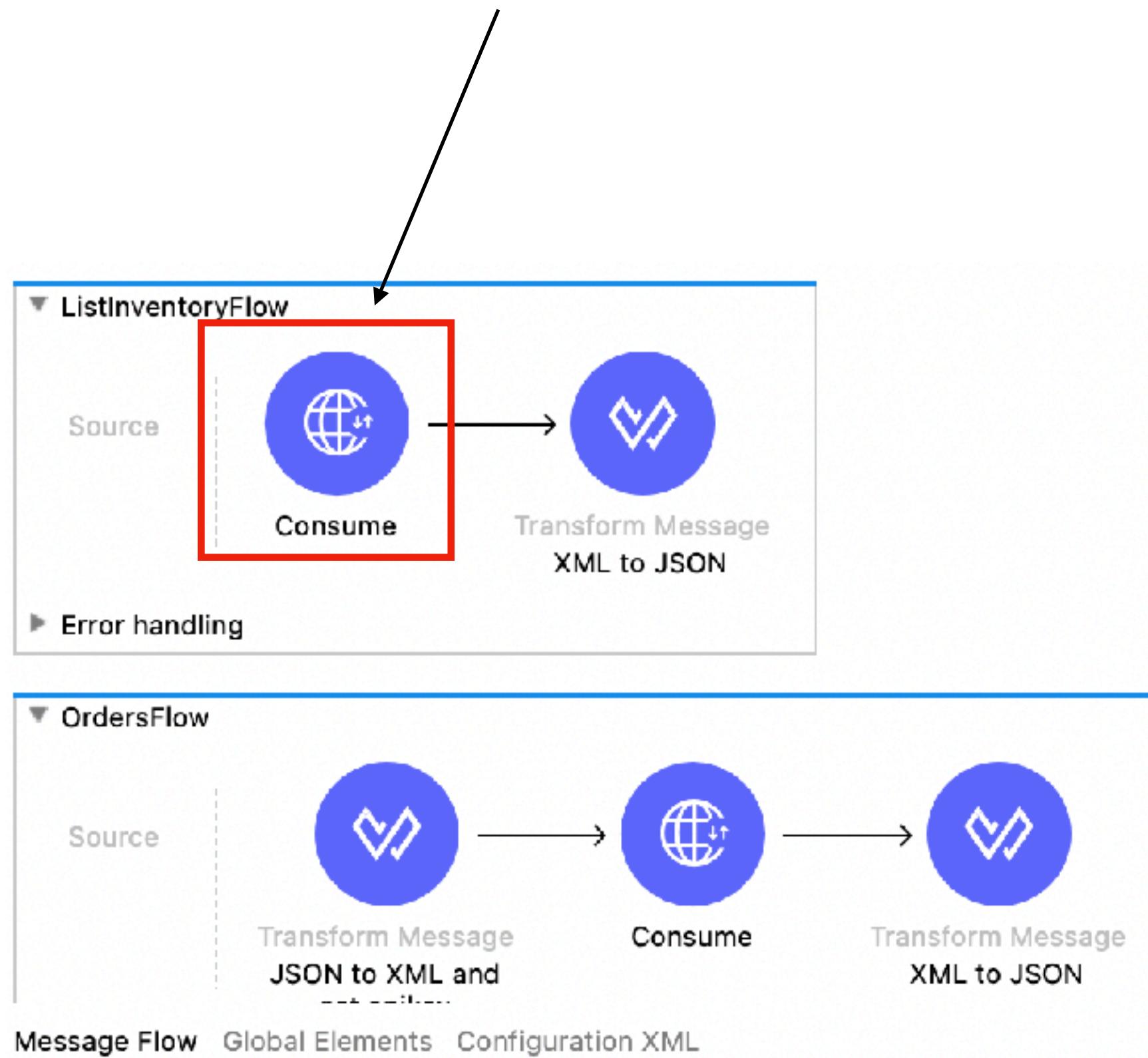
Root file

```

1  #%RAML 1.0
2  title: T-shirt store
3
4  /inventory:
5    get:
6      responses:
7        200:
8          body:
9            application/json:
10           example:
11             {
12               "inventory": {
13                 "count": "9844",
14                 "description": "Corporate swag kit at the platinum level",
15                 "productCode": "Corporate swag kit - platinum",
16                 "size": "NA"
17               }
18             }
19
20  /orders:
21    post:
22      body:
23        application/json:
24        example:
25          {
26            "email": "info@teeshirtshop.com",
27            "address1": "Corrientes 316",
28            "address2": "EP",
29            "city": "Buenos Aires",
30            "country": "Argentina",
31            "name": "MuleSoft Argentina",
32            "postalCode": "C1043AAQ",
33            "size": "L",
34            "stateOrProvince": "CABA"
35          }

```

## SOAP connector



GET <http://tshirt-tcb-gateway.us-e2.cloudhub.io/inventory>

Params Authorization Headers (7) Body Pre-request Script Tests Settings

Query Params

KEY	VALUE
Key	Value

Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize JSON

```
1 {
2   "inventory": {
3     "count": "9844",
4     "description": "Corporate swag kit at the platinum level",
5     "productCode": "Corporate swag kit - platinum",
6     "size": "NA"
7   },
8   "inventory": {
9     "count": "0",
10    "description": "Bold stripes make this cheerful fleece girls",
11    "productCode": "GIRLS GLACIER STRIPED FULL ZIP HOODIE - XS",
12    "size": "XS"
13 }
```

http://tshirt-tcb-gateway.us-e2.cloudhub.io/orders

POST <http://tshirt-tcb-gateway.us-e2.cloudhub.io/orders>

Params Authorization Headers (9) Body Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2   "email": "info@teeshidfdfrtshop.com",
3   "address1": "Corrientes 316",
4   "address2": "EP",
5   "city": "Buenos Aires",
6   "country": "Argentina",
7   "name": "MuleSoft Argentina",
8   "postalCode": "C1043AAQ",
9   "region": ""
10 }
```

Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize JSON

```
1 {
2   "headers": {},
3   "attachments": {},
4   "body": {
5     "OrderTshirtResponse": {
6       "orderId": "5880"
7     }
8   }
9 }
```

Status: 200 OK Time: 1540 ms

**Thank you**

*Enjoy integration with Mulesoft*