

# API Design : Create a Reverse Proxy with OpenAPI Specification

Duration : 20 mins

Persona : API Team

## Use case

You have a requirement to create a reverse proxy for taking requests from the Internet and forward them to an existing service. You have decided to follow design first approach & built a reusable component, a specification which can be used to build API Proxies, generate API documentation, generate API test cases using OpenAPI Specification format. You would like to generate an Apigee API Proxy by using the OpenAPI Specification (Swagger) instead of building the API Proxy from scratch.

## How can Apigee Edge help?

Apigee Edge enables you to quickly expose backend services as APIs. You do this by creating an API proxy that provides a facade for the backend service that you want to expose. Apigee Edge out of the box supports the OpenAPI specification, allowing you to auto-generate API Proxies. Apigee Edge also has an OpenAPI specification editor & store which you can use to maintain your OpenAPI specifications.

The API proxy decouples your backend service implementation from the API that developers consume. This shields developers from future changes to your backend services. As you update backend services, developers, insulated from those changes, can continue to call the API uninterrupted.

In this lab, we will see how to create a reverse proxy, that routes inbound requests to existing HTTP backend services using a readily available OpenAPI specification.

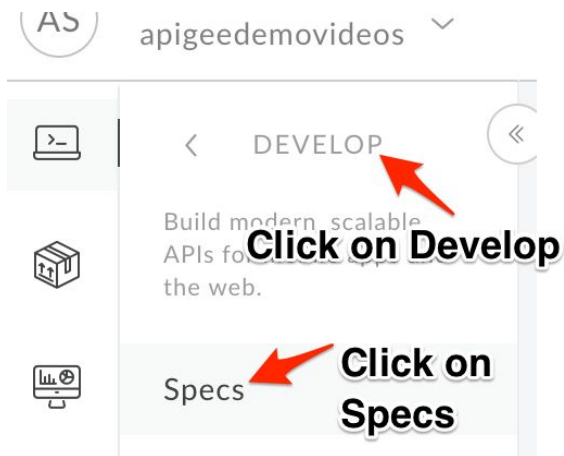
## Pre-requisites

Basic understanding of [OpenAPI Specification](#) (Swagger)

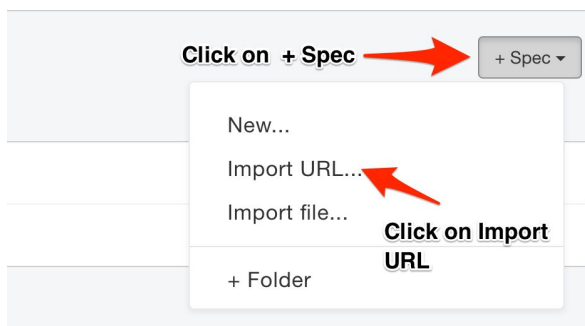
## Instructions

- Go to <https://apigee.com/edge> and log in. This is the Edge management UI.

- Select **Develop** → **Specs** in the side navigation menu



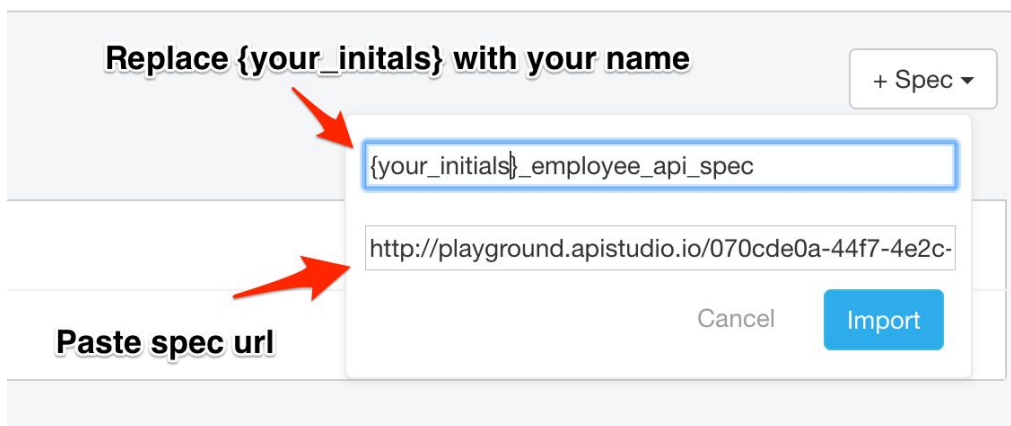
- Click **+ Spec**. Click on **Import URL** to add a new spec from existing source.



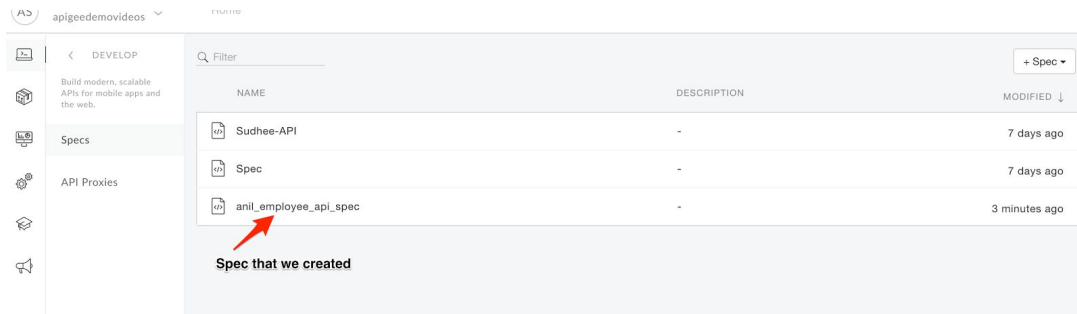
- Enter spec details. Replace **{your-initials}** with the initials of your name.

File Name: **{your-initials}\_employee\_api\_spec**

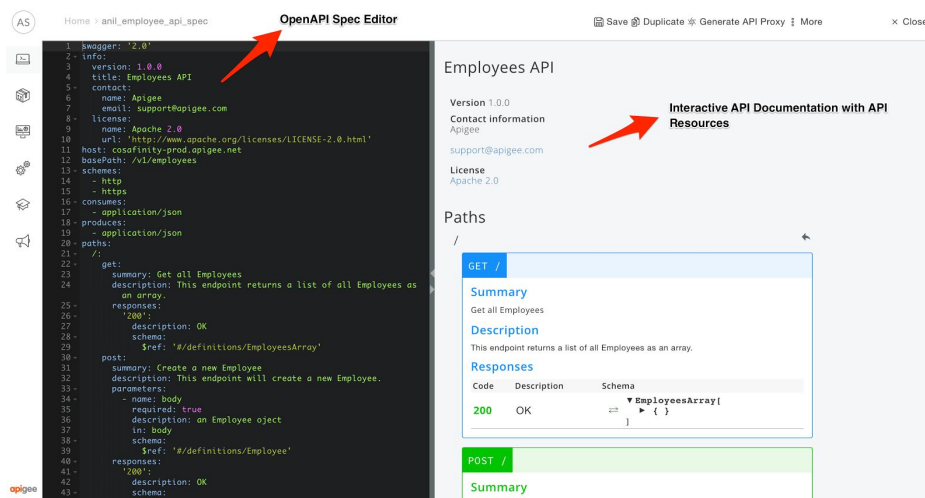
URL: <http://playground.apistudio.io/070cde0a-44f7-4e2c-8085-6e1020db7baf/spec>



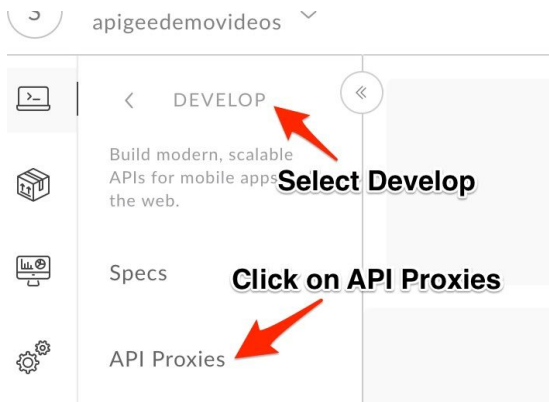
- Verify the values and click **Import**.
- Spec has been imported into Apigee Edge & Ready to use. You should see your spec in the list. For example,



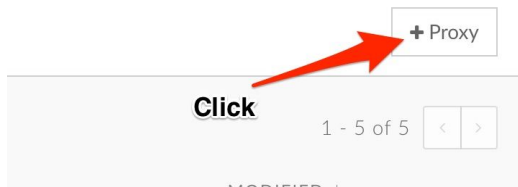
- Click on **{your-initials}\_employee\_api\_spec** from the list to access Open API spec editor & interactive documentation that lists API details & API Resources.



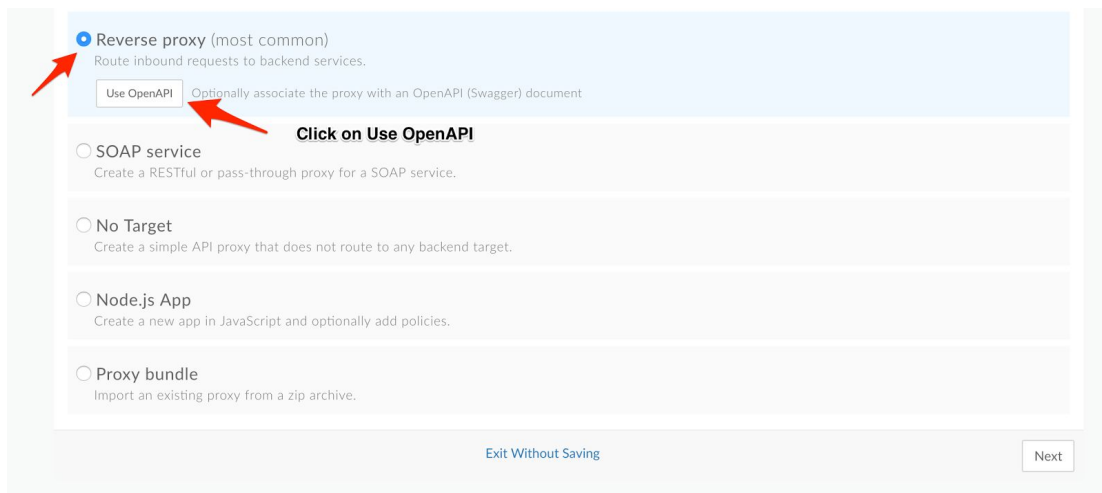
- It's time to create Apigee API Proxy from Open API Spec. Click on **Develop > API Proxies** from side navigation menu.



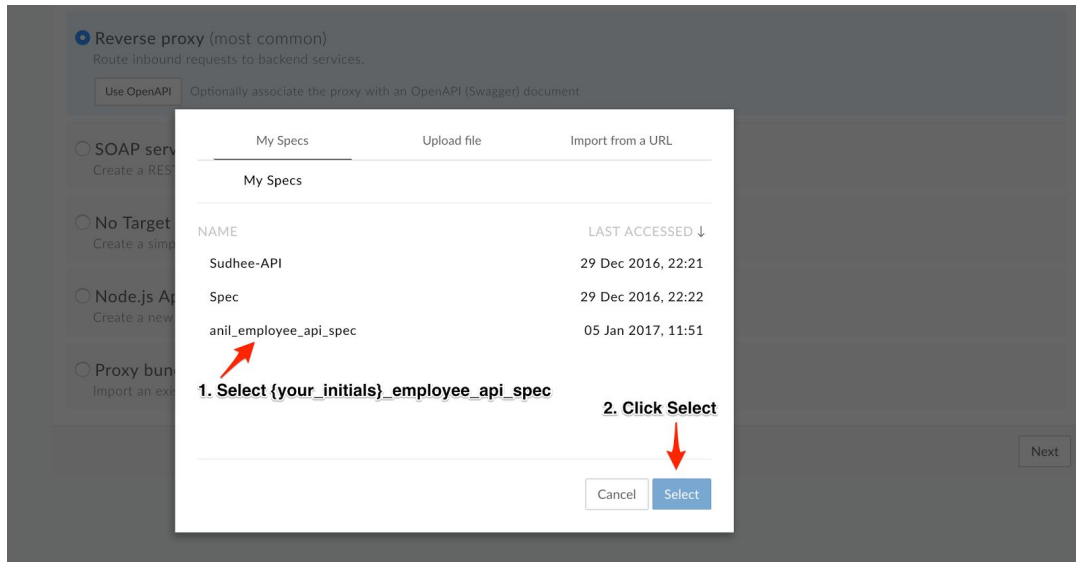
- Click **+ Proxy**. The Build a Proxy wizard is invoked.



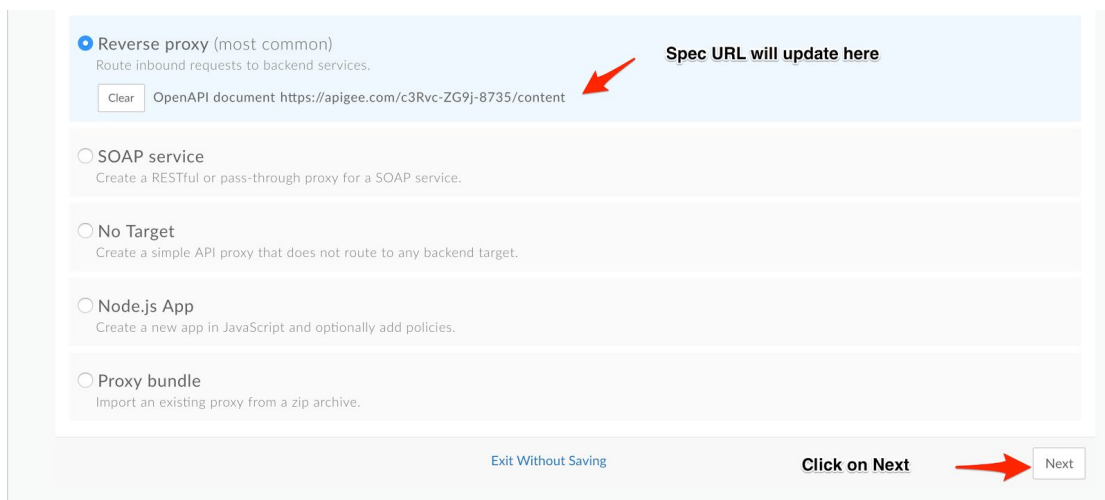
- Select **Reverse proxy**, Click on **Use OpenAPI** below reverse proxy option.



- You should see a popup with list of Specs. Select **{your-initials}\_employee\_api\_spec** and click **Select**.



- You can see the selected OpenAPI Spec URL below the Reverse Proxy option, Click **Next** to continue.



- Enter details in the proxy wizard. Replace **{your-initials}** with the initials of your name.

Proxy Name: **{your\_initials}\_employee\_proxy**

Proxy Base Path: /v1/**{your\_initials}\_employee\_proxy**

Existing API: Observe the field value which is auto filled from OpenAPI Spec.

Specify the proxy details.

Replace {your\_initials} with your name

Proxy Name \*

Enter a valid name.  
Valid characters are letters, numbers, dash (-), and underscore ( \_ ).

Proxy Base Path \*

Replace {your\_initials} with your name

Enter a valid base path.  
A path component that uniquely identifies this API proxy. The public-facing URL of this API proxy is comprised of your organization name, an environment where this API proxy is deployed, and this Proxy Base Path. Example URL `http://apigeevideos-test.apigee.net/v1/{your_initials}_employee_proxy`

Existing API \*

Defines the target URL invoked on behalf of this API proxy. Any URL that is accessible over the open Internet can be used. Example:  
`https://api.usergrid.com`

Description

Previous Exit Without Saving Next

- Verify the values and click **Next**.
- You can select, de-select list of API Proxy Resources that are pre-filled from OpenAPI Spec. Select all & Click on **Next**.

Select the operations to manage with policies. You can add more later. 5 of 5 operations selected

<input checked="" type="checkbox"/>	Path	Verb	Operation ID	Summary
<input checked="" type="checkbox"/>	/	GET		Get all Employees
<input checked="" type="checkbox"/>	/	POST		Create a new Employee
<input checked="" type="checkbox"/>	/[employee-uuid]	GET		Get an Employee with given UUID.
<input checked="" type="checkbox"/>	/[employee-uuid]	PUT		Update an Employee with given UUID
<input checked="" type="checkbox"/>	/[employee-uuid]	DELETE		Delete an Employee with given UUID

Previous Exit Without Saving Click Next Next

- Select **Pass through (none)** for the authorization in order to choose not to apply any security policy for the proxy. Click Next.

Type Details Security Virtual Hosts Build Summary

Secure access for users and clients.

Authorization ☒ Pass through (none) **Select Pass through**

☐ API Key

☐ OAuth 2.0

Browser ☐ Add CORS headers

Previous Exit Without Saving **Click** Next

- Go with the **default Virtual Host** configuration.

Type Details Security Virtual Hosts Build Summary

Select the virtual hosts this proxy will bind to when it is deployed. You must select at least one virtual host. [Learn more...](#)

<input checked="" type="checkbox"/>	Name	Environment	Host Aliases
<input checked="" type="checkbox"/>	default	prod	http://apigeedemovideos-prod.apigee.net
		test	http://apigeedemovideos-test.apigee.net
<input checked="" type="checkbox"/>	secure	prod	https://apigeedemovideos-prod.apigee.net
		test	https://apigeedemovideos-test.apigee.net

Previous Exit Without Saving **Click** Next

- Ensure that only the **test** environment is selected to deploy to and click **Build and Deploy**.

Type Details Security Virtual Hosts Build Summary

You are ready to build and deploy your API proxy.

Deploy Environments ☐ prod ☒ test **Select test environment**

Proxy Name sudhee\_reverse\_proxy

Proxy Type Reverse proxy

Virtual Hosts default, secure

Previous Exit Without Saving **Click** Build and Deploy

- Once the API proxy is built and deployed **click** the link to view your proxy in the proxy editor.

Type Details Flows Security Virtual Hosts Build Summary

✓ Generated proxy

✓ Uploaded proxy

✓ Deployed to test

View [anil\\_employee\\_proxy](#) proxy in the editor .

**Click to view API Proxy**

- You should see the proxy **Overview** screen

Project Save Revision 1 Deployment Overview Develop Trace Performance

Revision 1 Summary **Proxy Revision**

Created: 7 minutes ago, Updated: 7 minutes ago.

No description for this proxy.

Deployments

Environment	Revision	Status	URL
test	1	●	<a href="http://apigeevideos-test.apigee.net/v1/anil_employee_proxy">http://apigeevideos-test.apigee.net/v1/anil_employee_proxy</a> [ + ]

**Deployed Environment**

Proxy Endpoints

Name	Base Path	Target Endpoints
default	/v1/anil_employee_proxy	default

**API Basepath**

Target Endpoints

Name	Target	Used by Proxy Endpoints
default	<a href="http://cosafinity-prod.apigee.net/v1/employees">http://cosafinity-prod.apigee.net/v1/employees</a>	default

**Target Endpoint**

**API Proxy Endpoint**

**Overview Tab** **Develop Tab** **Trace Tab**

- Congratulations!...** You have now built a reverse proxy for an existing backend service.
- Let us test the newly built API proxy using the REST Client (<https://apigee-rest-client.appspot.com/>). Open the REST Client on a new browser window.
- Copy the URL for your API proxy.



Project [v] Save [Revision 1 v] Deployment [v]

OVERVIEW DEVELOP TRACE PERFORMANCE

Revision 1 Summary  
Created: 7 minutes ago, Updated: 7 minutes ago.  
No description for this proxy.

Deployments

Environment	Revision	Status	URL
test	1	●	<a href="http://apigeedemovideos-test.apigee.net/v1/anil_employee_proxy">http://apigeedemovideos-test.apigee.net/v1/anil_employee_proxy</a> [ + ]

Copy the URL

Proxy Endpoints

Name	Base Path	Target Endpoints
default	/v1/anil_employee_proxy	default

Target Endpoints

Name	Target	Used by Proxy Endpoints
default	<a href="http://cosafinity-prod.apigee.net/v1/employees">http://cosafinity-prod.apigee.net/v1/employees</a>	default

- Paste the link on the REST Client and make a GET call

1. Select GET Method

3. Click Send

2. API Proxy URL

GET [http://apigeedemovideos-test.apigee.net/v1/anil\\_employee\\_proxy](http://apigeedemovideos-test.apigee.net/v1/anil_employee_proxy) Send

- You should see a success response similar to this -

Body Headers Cookies

Employee JSON response

Response Status : 200

Success Response (HTTP 200 OK)

```
[
  {
    "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"
  },
  {
    "uuid": "7edd3449-c89f-11e6-861b-0ad881f403bf",
    "type": "employee",
    "name": "Gallegos Leonard",
    "created": 1482449803516,
    "modified": 1482449803516,
    "birthDate": "06-20",
    "city": "Ruffin",
    "department": "IT",
    "email": "gallegosleonard@cognicode.com",
    "phone": "+1 (947) 560-2391",
    "postal": 64285,
    "state": "Iowa",
    "street": "608 Chester Street"
  }
]
```

## Lab Video

If you like to learn by watching, here is a short video on creating a reverse proxy using Open API Specification - <https://www.youtube.com/watch?v=3XBG9QOUPzg>

## Earn Extra-points

Now that you have created a reverse proxy using OpenAPI spec, Click on the Develop tab & explore the flow conditions populated from OpenAPI spec. Also, Explore OpenAPI Spec editor using which you can edit OpenAPI specification & Generate API Proxy using the link above the OpenAPI Spec editor. Explore trace tab in Proxy overview page.

## Quiz

1. How to download (backup) the proxy you just created ?
2. Why trace is useful in API Proxy development ?

## Summary

That completes this hands-on lesson. In this simple lab you learned how to create a proxy for an existing backend using OpenAPI Specification and Apigee Edge proxy wizard.

## References

- Useful Apigee documentation links on API Proxies -
  - Build a simple API Proxy - <http://docs.apigee.com/api-services/content/build-simple-api-proxy>
  - Best practices for API proxy design and development - <http://docs.apigee.com/api-services/content/best-practices-api-proxy-design-and-development>
- Watch this 4minute video on “Anatomy of an API proxy” - <https://youtu.be/O5DJuCXXIRg>

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