

IMS Hands-On Lab

z/OS Connect and IMS OpenAPI 3 - PART 3

Introduction:

This is an opportunity to get your hands dirty and play with the new IMS support for OpenAPI 3 and expose an IMS transaction as an API. This exercise uses the z/OS Connect Designer to create a IMS z/OS Asset and create APIs to access the IMS Phonebook transaction.

PART 1 - Create the API to GET a contact's information from the phonebook

PART 2 – Create the API to POST (add) a contact to the phonebook

PART 3 – Create the API to UPDATE the contact

you added in PART 2

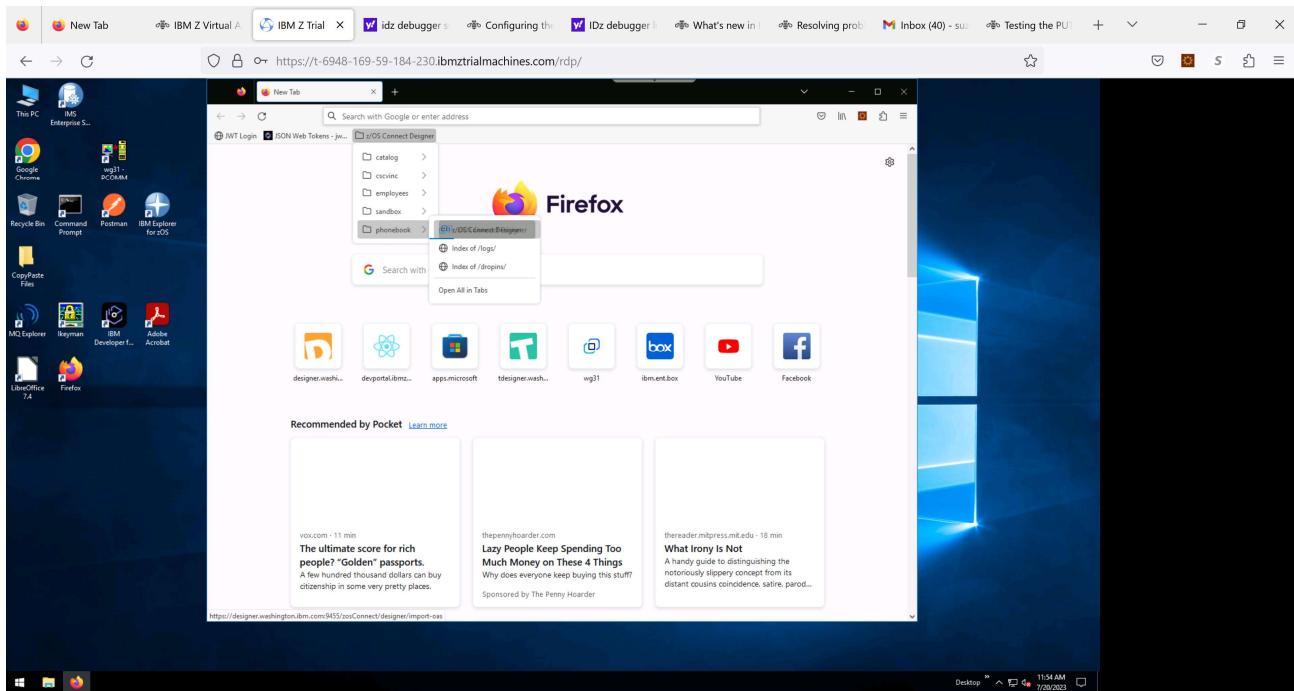
PART 4 - Create the API to DELETE the contact you added in PART 2

This lab is a continuation of the lab for the IMS IVTNO transaction (Phonebook). The assumption is that you have completed the GET and POST methods. The goal is to update information associated with the contact name you added as part of the POST exercise.

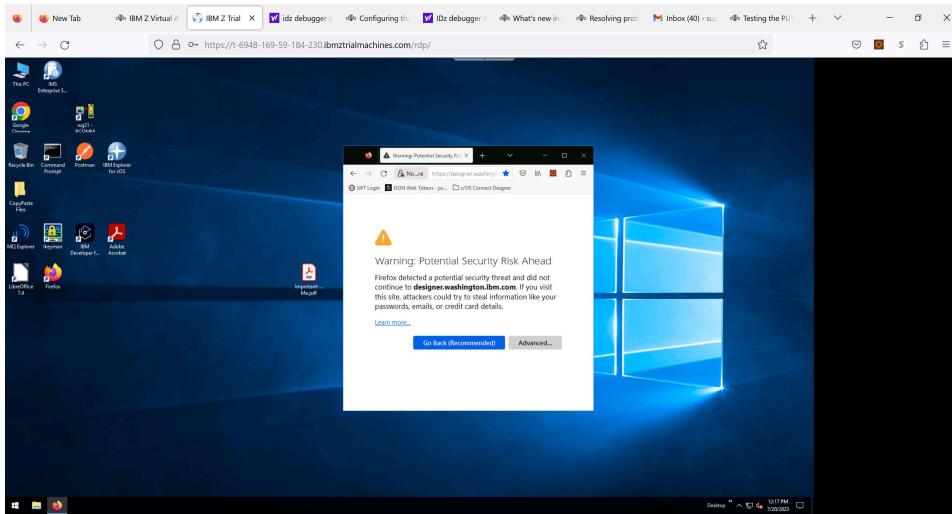
This exercises assumes you have already created the z/OS asset and have imported the YAML file in a previous exercise.

If not already done, open up a **Firefox browser**

- Click on **z/OS Connect Designer > phonebook > zOS Connect designer**
 - Make sure you choose phonebook



- Accept the risk (Advanced) and wait (it takes a while to set it up)



This exercise uses the **PUT** method to update a new contact into the phonebook. If you click on z/OS Assets, notice that the asset that was previously created is available for reuse.

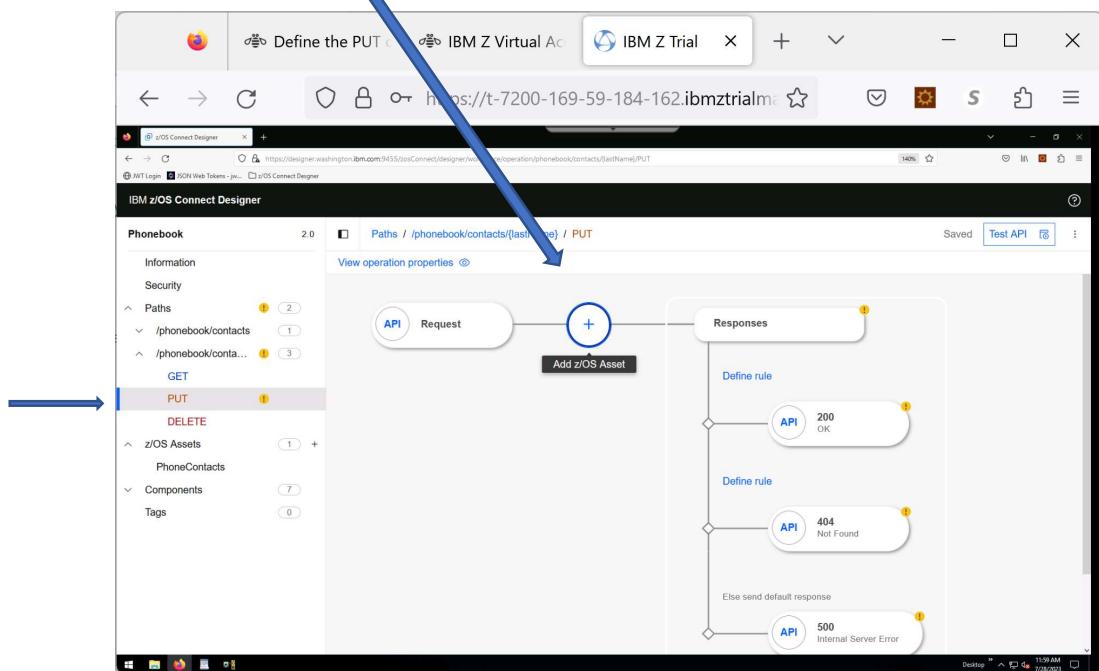
The screenshot shows a browser window titled "IBM Z Trial" with the URL <https://t-7200-169-59-184-162.ibmtrialmachines.com/>. The page displays the "IBM z/OS Connect Designer" interface. On the left, there is a sidebar with a tree view:

- Phonebook**: Contains "Information", "Security", and "Paths" (with items /phonebook/contacts, /phonebook/contact, and /phonebook/conta...).
- z/OS Assets**: Contains "PhoneContacts" (selected), "Components" (with 7 items), and "Tags" (with 0 items).

The main content area shows the "PhoneContacts" asset details:

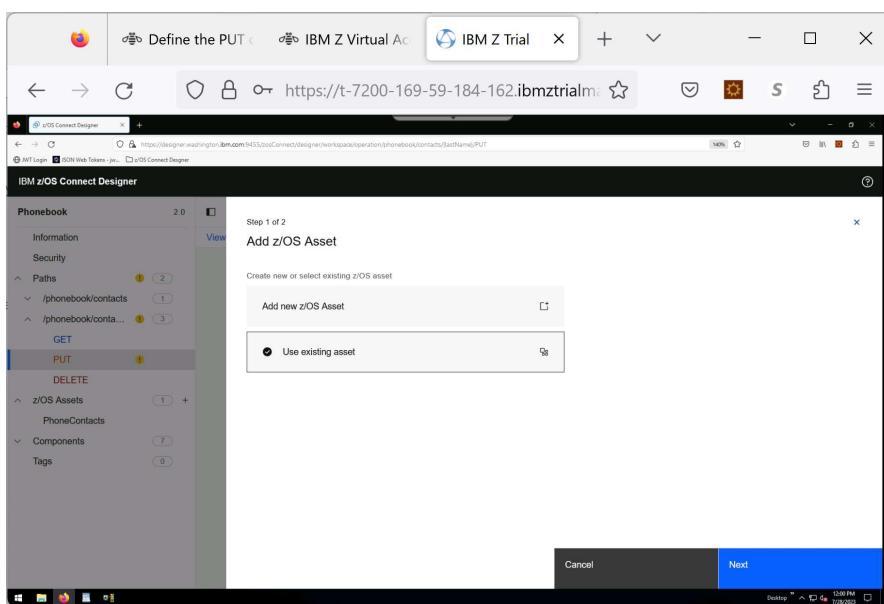
- General**: Name is "PhoneContacts", Type is "IMS transaction", and Description is "-".
- IMS transaction**: Transaction code is "IVTNO", Connection profile is "imsConn", and Program language is "COBOL".
- Request structure**: INPUT-MESSAGE
- Response structure**: OUTPUT-AREA

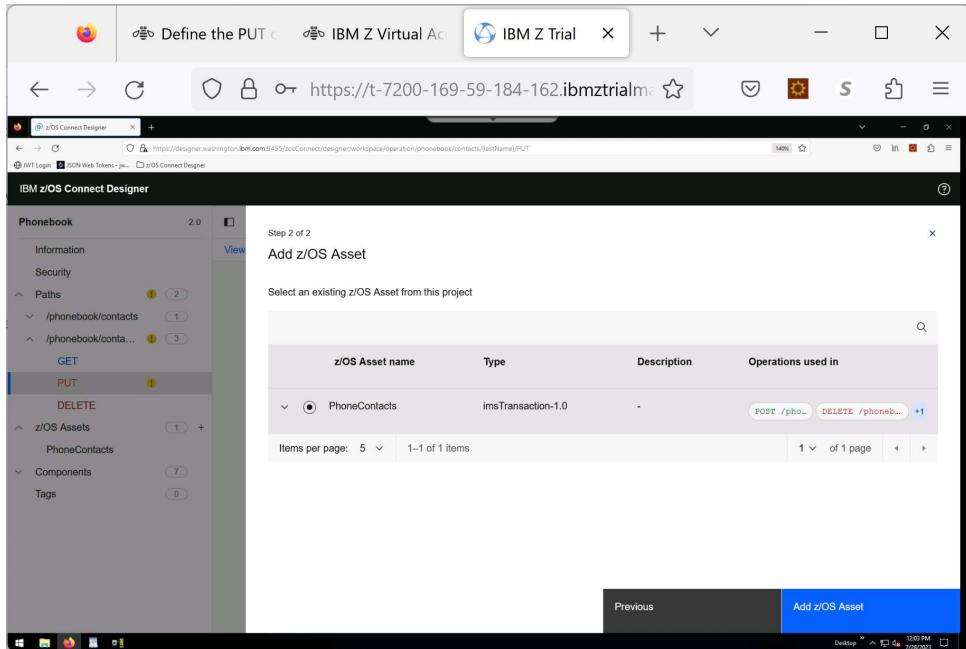
- Click on the **PUT** method to start the process and bring up the Operations Flow Diagram.
- Click on the **+** (plus) to add a z/OS asset



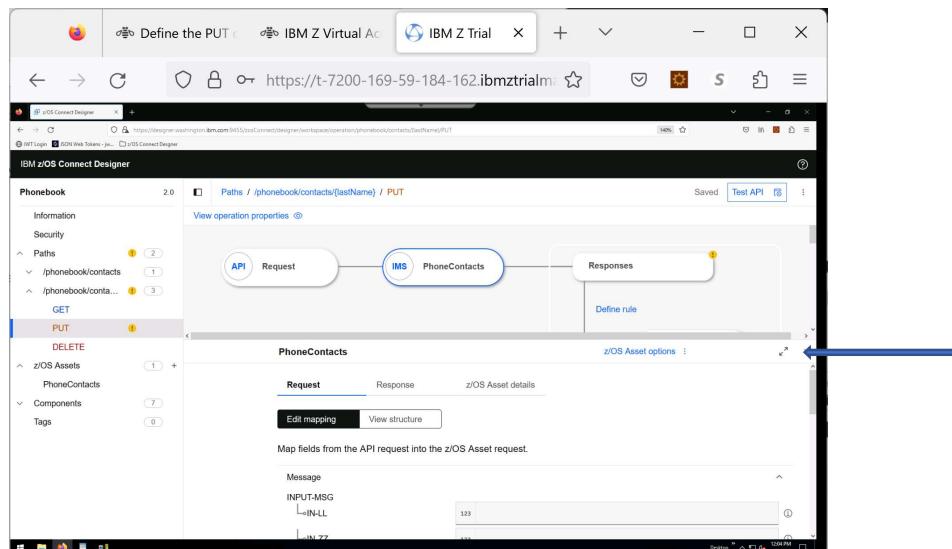
Add the z/OS Asset and map the request fields

- Select **Use existing asset** and click **Next**.

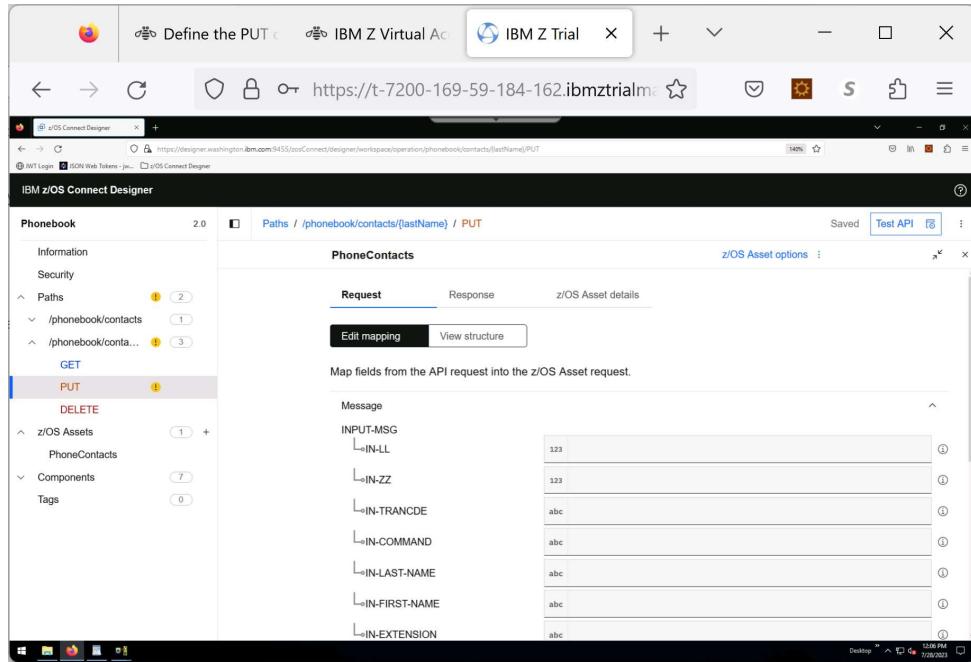




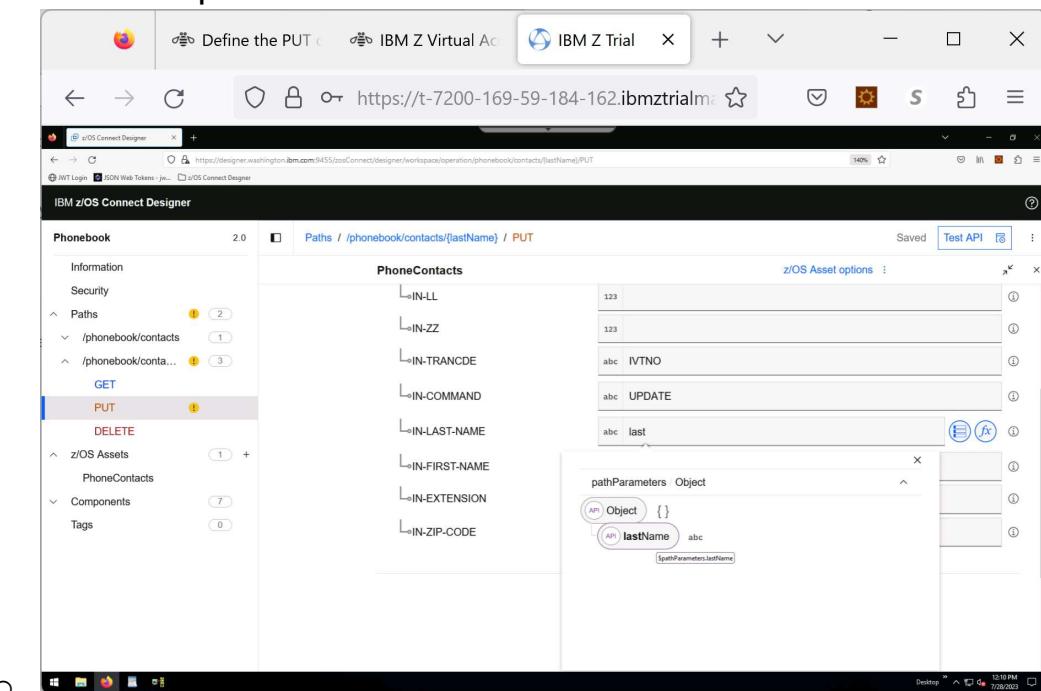
- Select **PhoneContacts** which was created in the first exercise.
- Click **Add z/OS Asset**

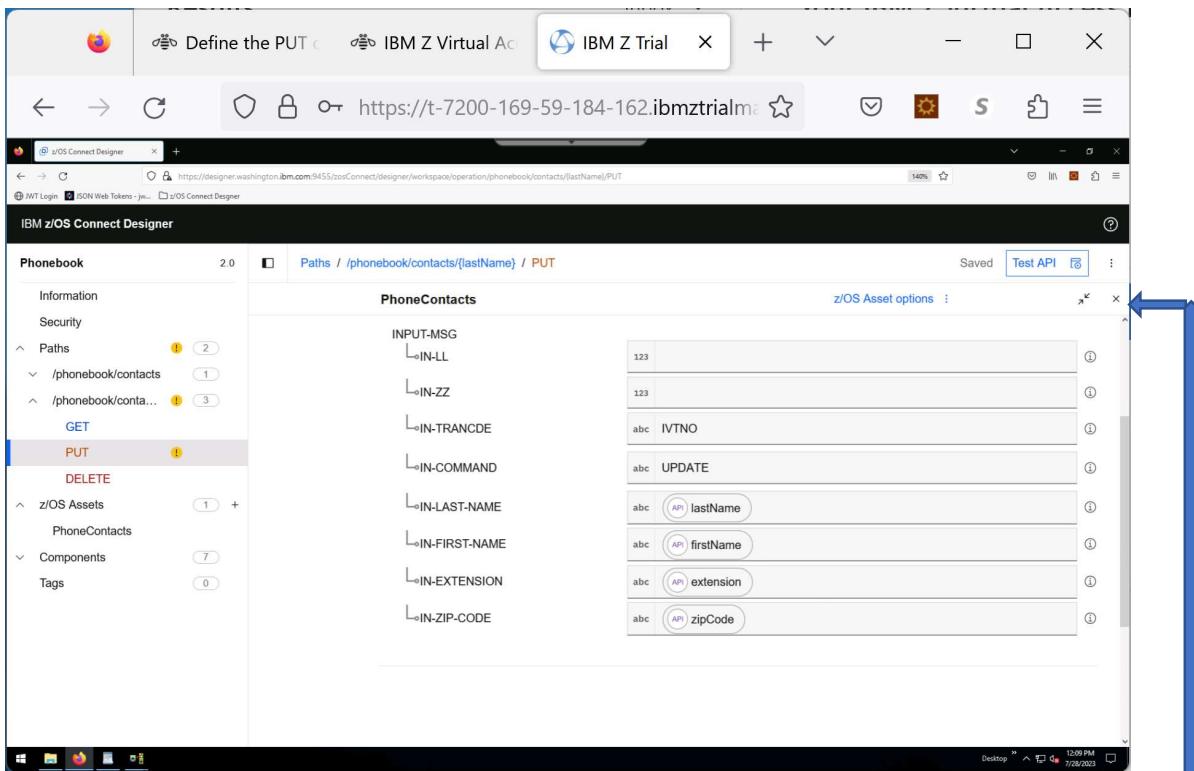


- When the mapping panel opens up
- Maximize the panel using the two arrows on the upper right

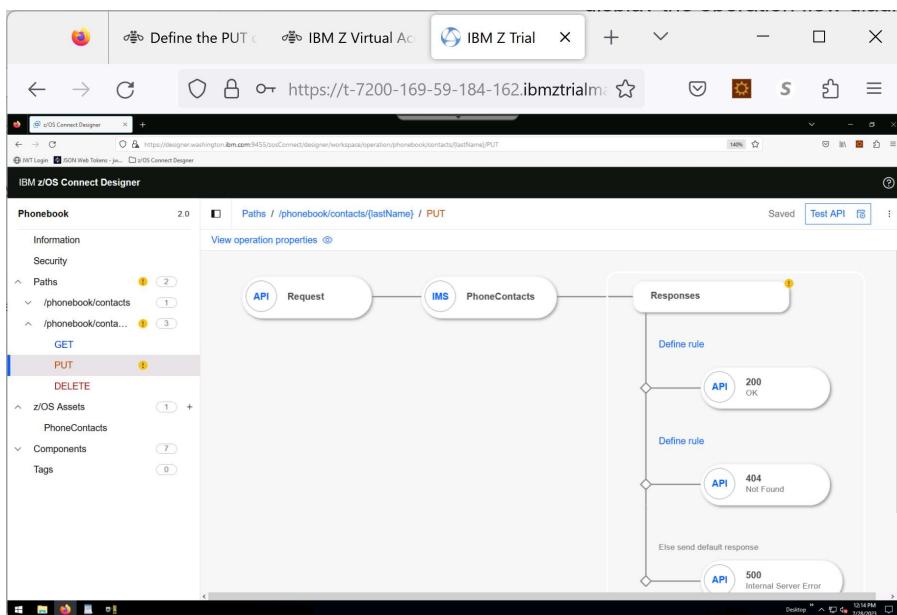


- Key in **IVTNO** (uppercase) in the **IN_TRANCDE** field
- Key in **UPDATE** (uppercase) in the **IN-COMMAND** field
- Map the API Request parameter lastName into the **IN-LAST-NAME** z/OS Asset Request field.
 - Key in **lastName** in the **IN-LAST-NAME** field. Note that when you start typing, the **Available Mappings** menu opens with the available parameters. Select **lastName** from the list.





- Key in **firstName** in the IN-FIRST-NAME field.
- Key in **extension** in the IN-EXTENSION field.
- Key in **zipCode** in the IN-ZIP-CODE field.
- Minimize this panel (double arrows) or close it (x)on the upper right to display the operation flow diagram.

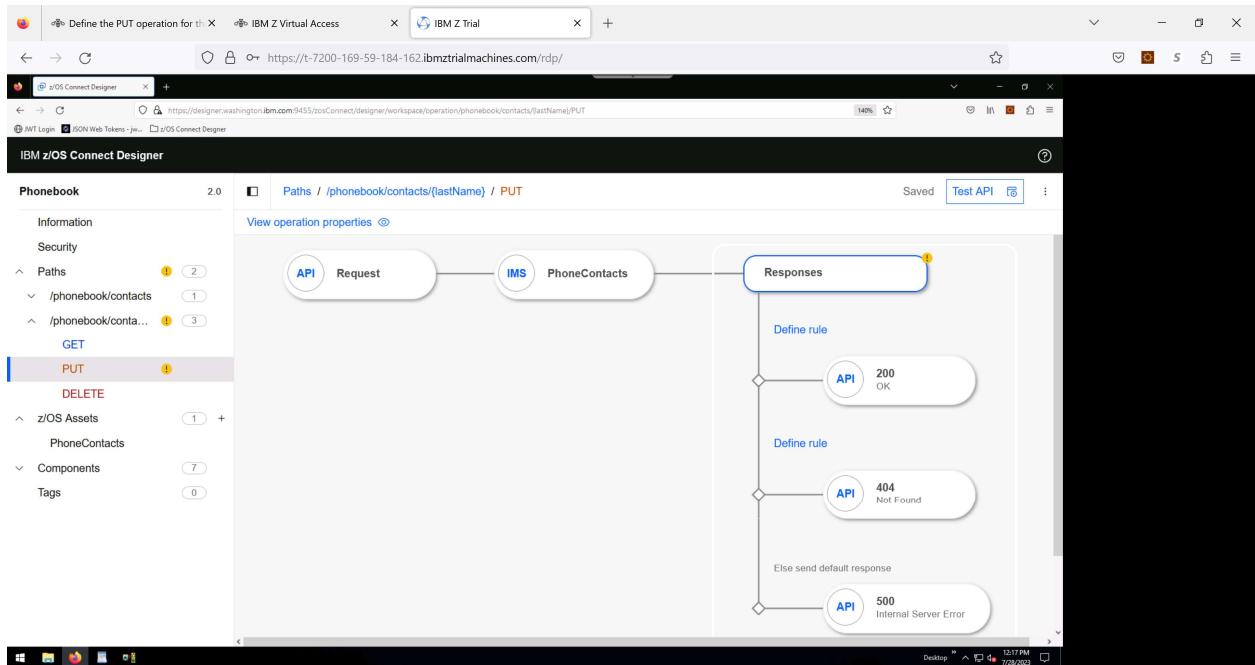


Map the API Response fields

- Click **Responses** on the operation flow diagram. The Responses configuration pane opens. Responses are evaluated from top to bottom where the final response is the default response.

As a reminder, each response has the following properties:

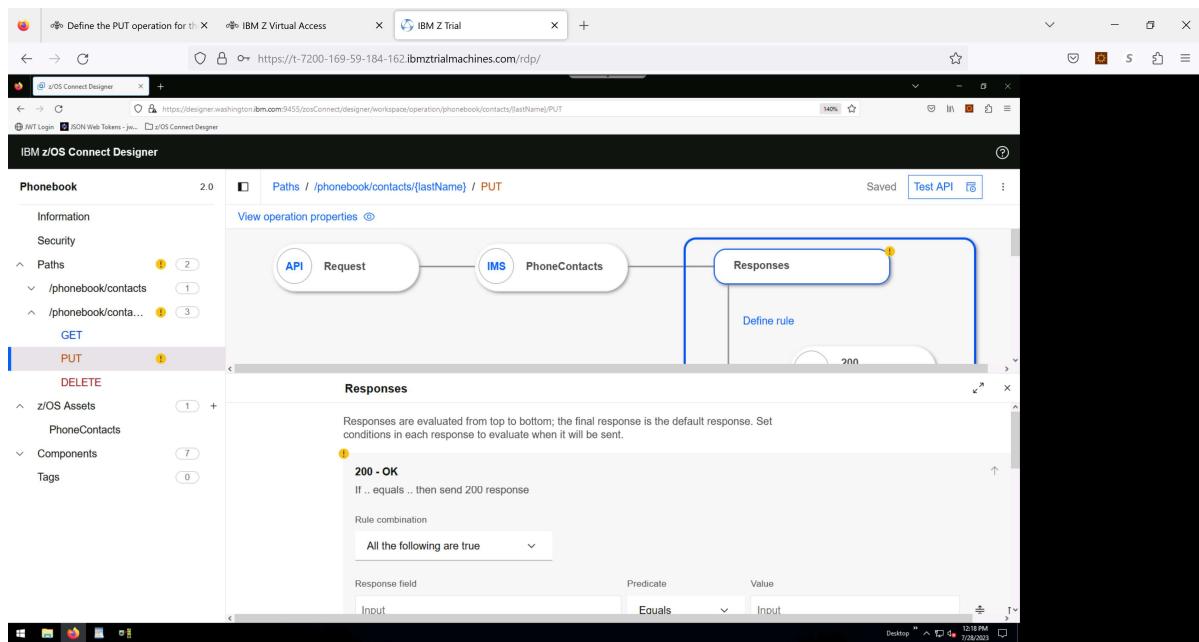
- A condition with three fields, *response*, *predicate*, and *value*.
- One or more *conditions*.
- You can change the order of the responses by using the ↑ and ↓ buttons next to each response case.
- The sequence of the conditions within a response can be changed. Click ↑↓ to change the position in the sequence.
- Conditions can be deleted.



The default order of the responses is such that **200 OK** is the first to be evaluated and **500 - Internal server error** is the last and therefore the default response. (Best practice is to configure 500 - Internal server error

as the default response to capture any errors in the conditional logic of the response.)

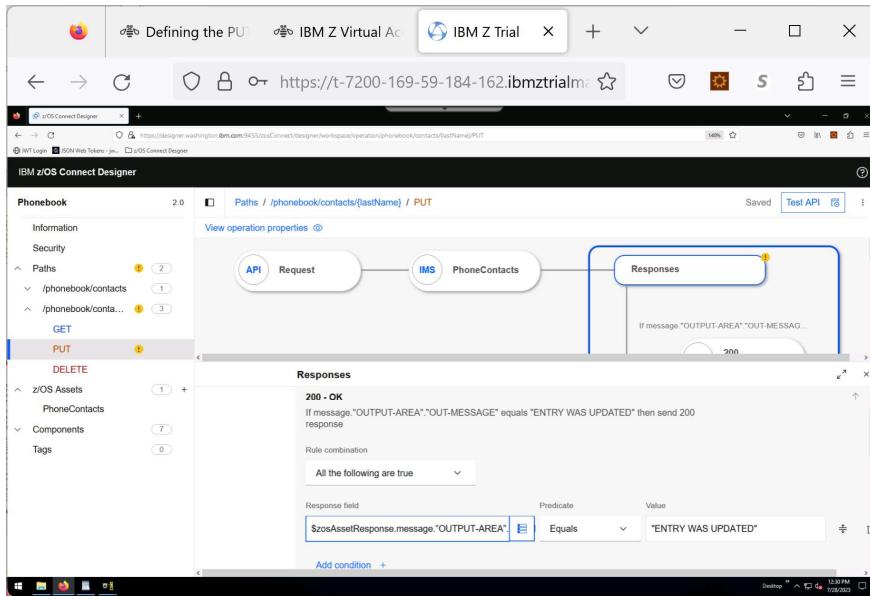
- Set the **200 OK** response code condition
 - This code indicates that the requested contact and associated information were updated in the phonebook database.
- Maximize the lower panel.



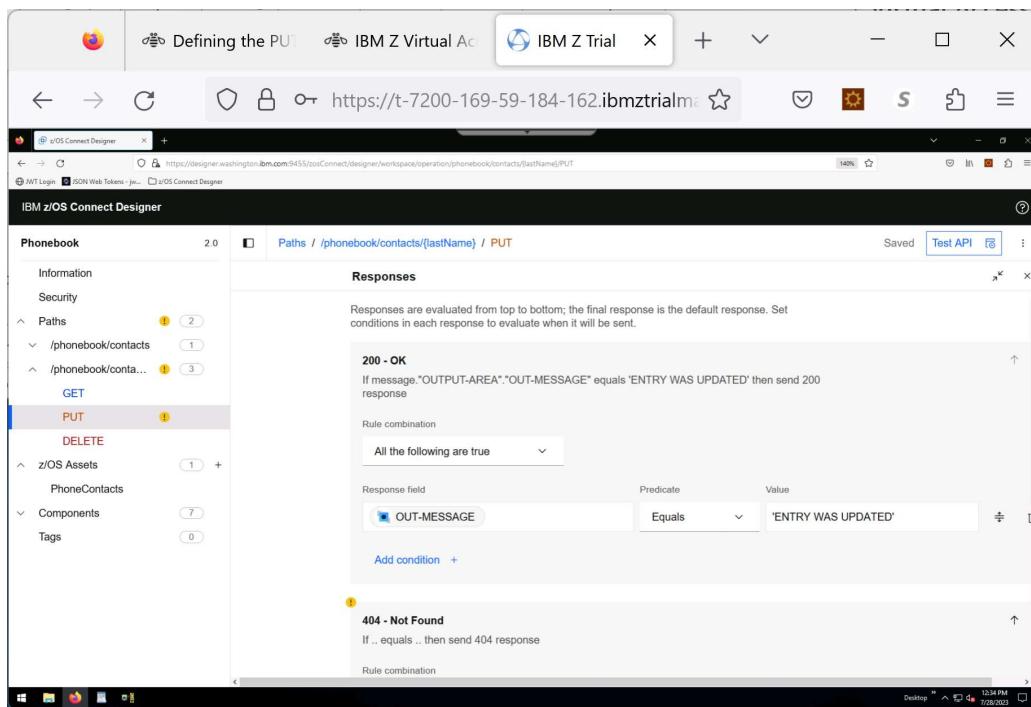
Set the conditions for the 200 OK response condition.

- Key in the following into the **Response field** – **note** the case and quotes
\$zosAssetResponse.message."OUTPUT-AREA"."OUT-MESSAGE"

OUTPUT-AREA is the name of the segment that was given when creating the z/OS asset – if a different name was used, then that name should be used instead of OUTPUT-AREA.

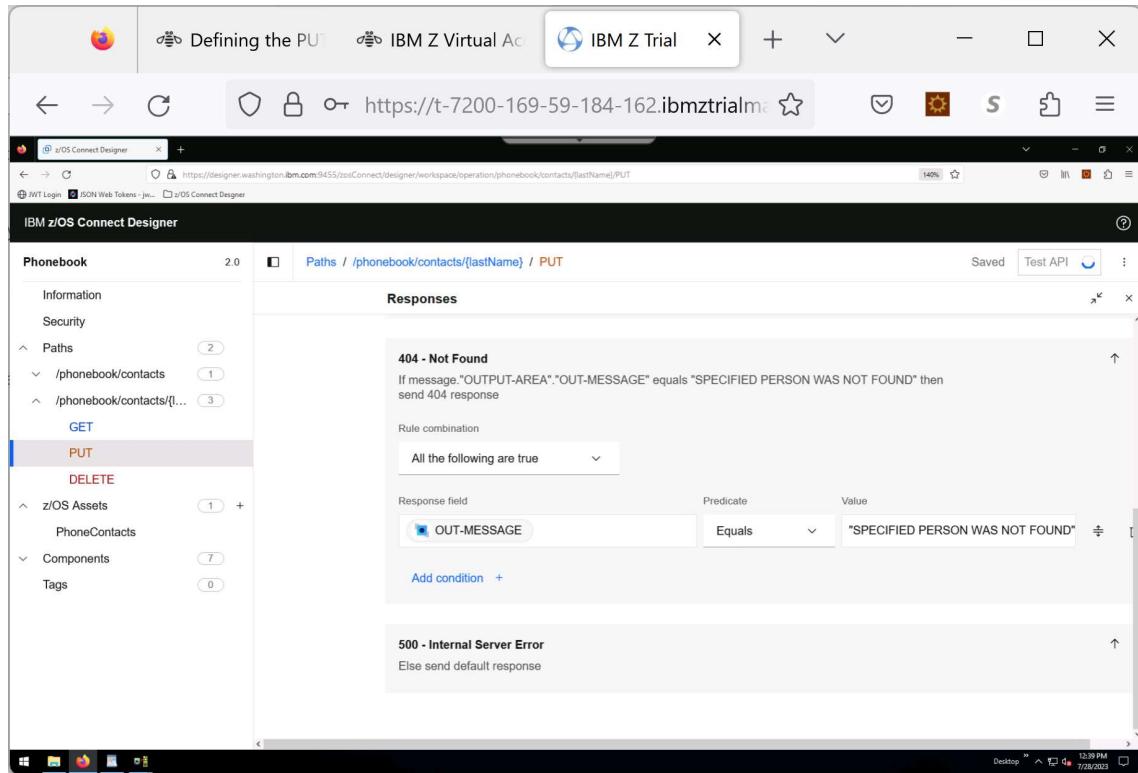


- Also key in “**ENTRY WAS UPDATED**” (note the double quotes) in the corresponding Value field.



If done correctly, the mark associate with the 200 OK should disappear.

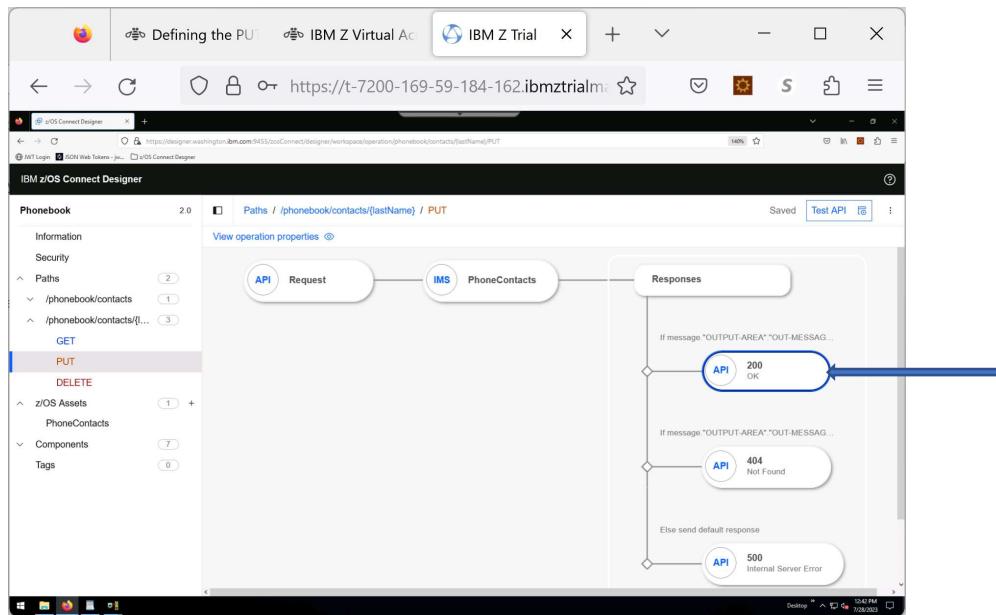
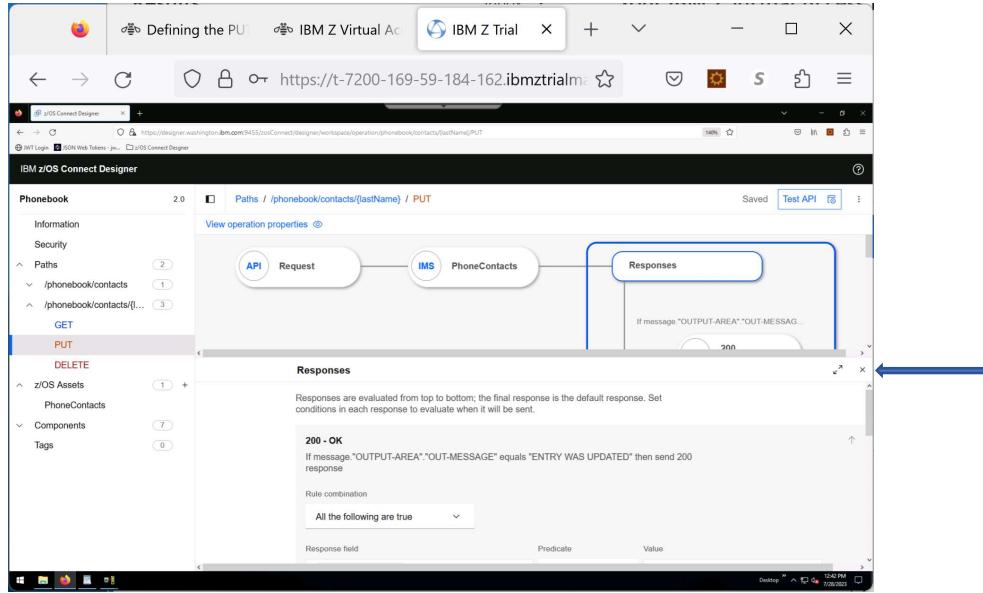
- Set the **404 - Not Found** response code condition
- Either:
 - Copy and paste the condition from the 200 code
 - Or, once again type in:
\$zosAssetResponse.message."OUTPUT-AREA"."OUT-MESSAGE"
- Also key in “**SPECIFIED PERSON WAS NOT FOUND** in the **Value** field.



The 500 -Internal server error response is the default, so it has no conditions and must be the last entry in the table.

The final set of tasks before running a test, is to map the responses from the z/OS asset (IMS response) to the API Response fields.

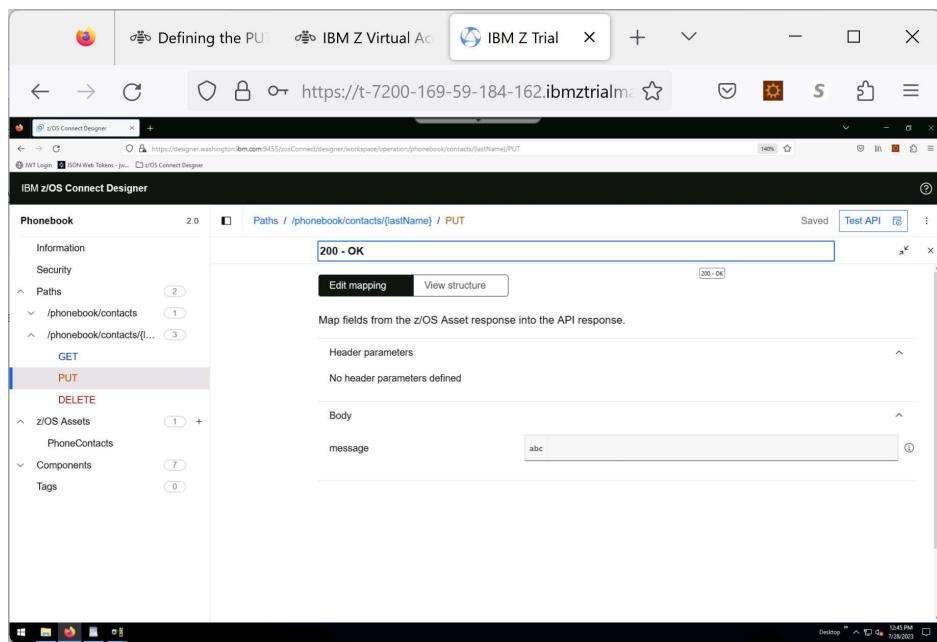
- Minimize the panel you have been working on by clicking the double arrows at the top right to get back to the primary window. You can also close the panel.



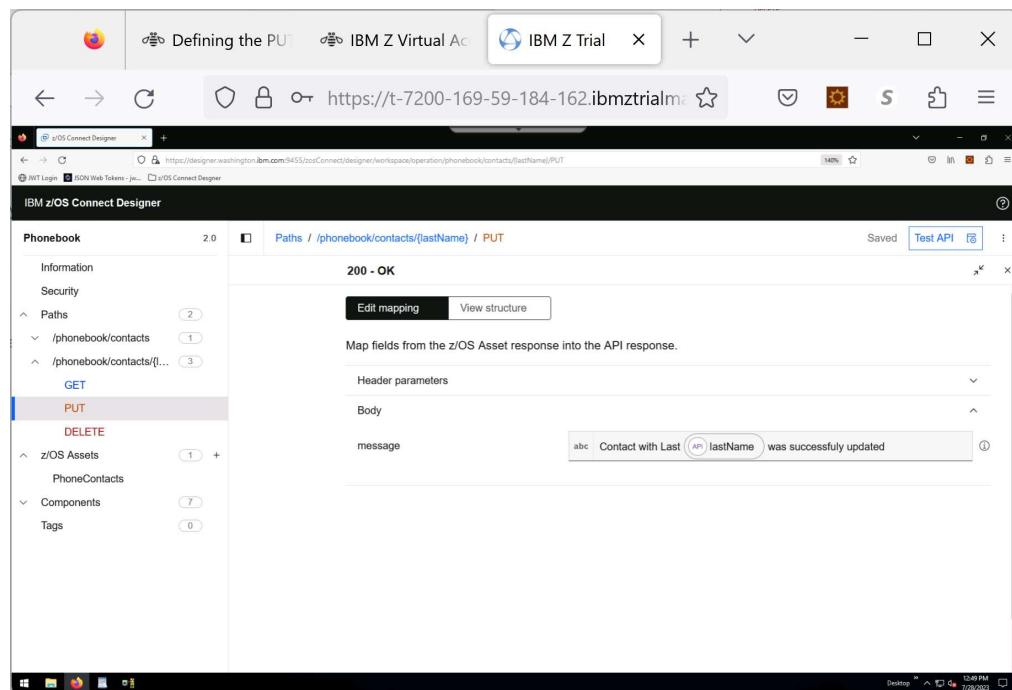
Map the 200 response.

- In the Operation flow diagram, click the **200** response node.

A 200 response code indicates that the update of the requested phonebook contact was successfully completed.

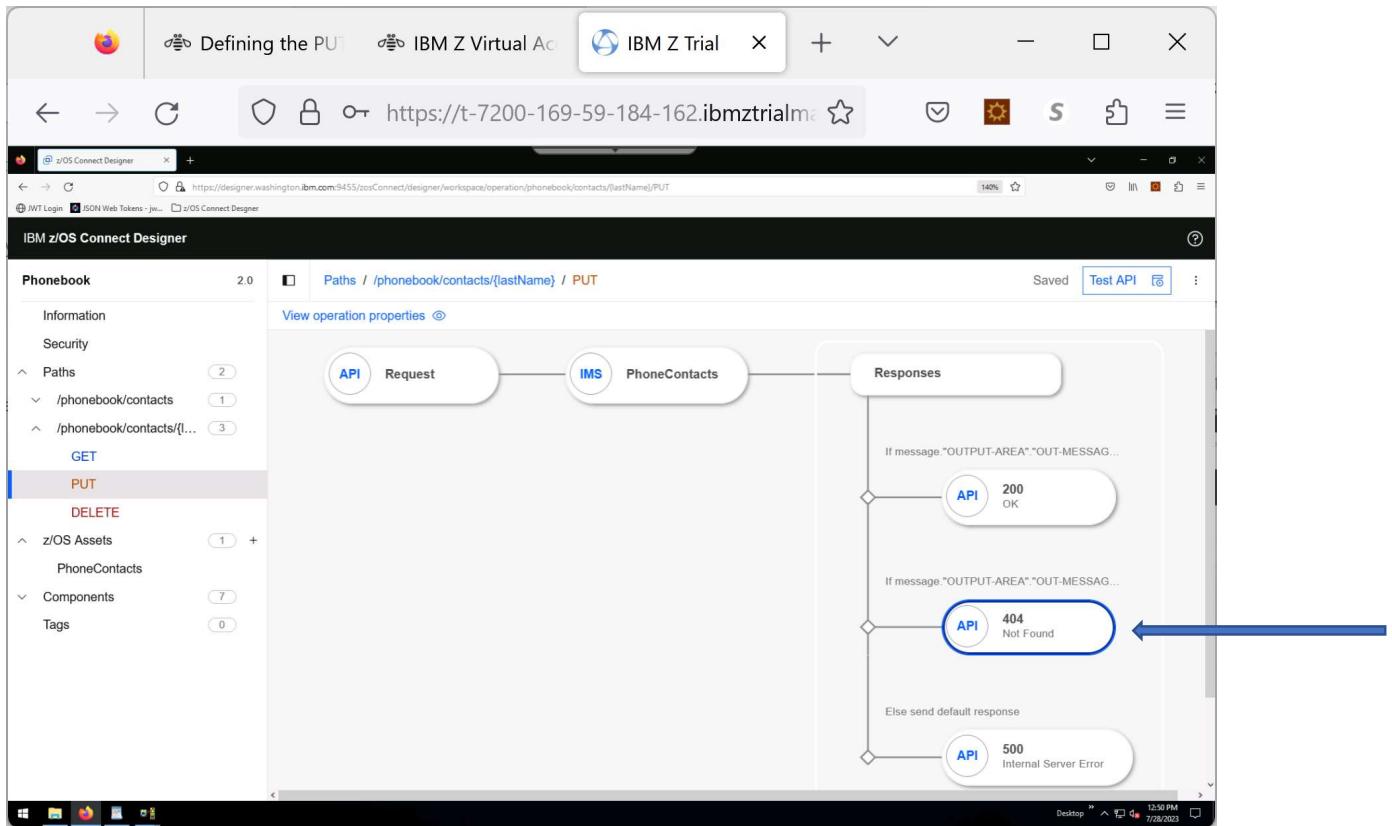


- For a successful operation, all that is returned by the application is a message.
 - Key in:
 - Contact with Last Name `{{$apiRequest.pathParameters.lastName}}` was successfully updated.



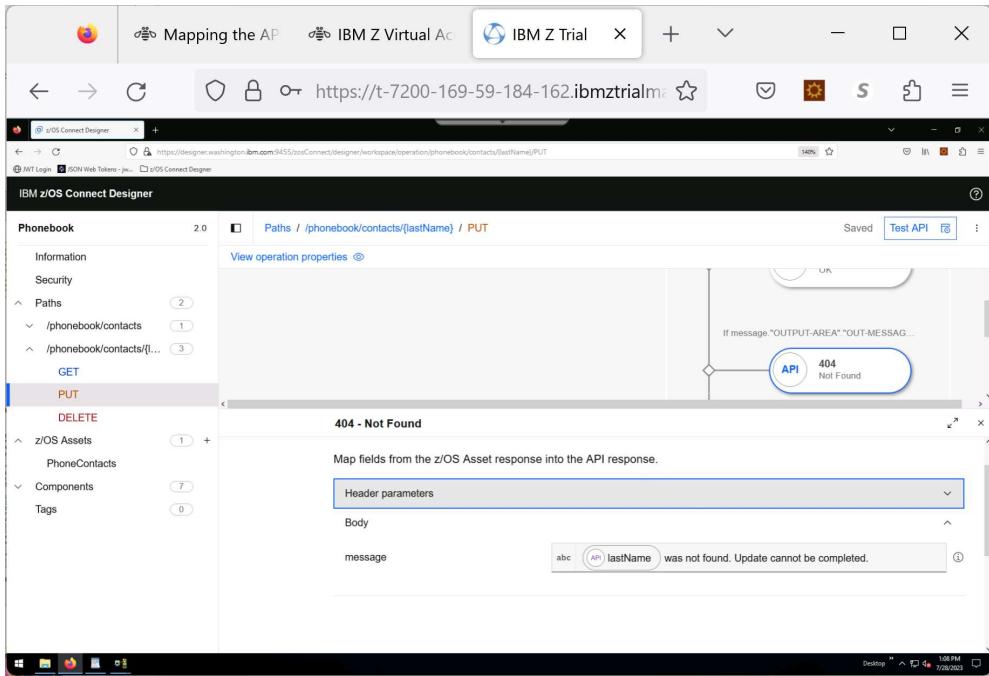
- Minimize the panel to go back to the Operation flow diagram

Map the 404 response.



Configure the 404 response to return a message to explain that the contact could not be updated. The entry was not found.

- Key the following into the **message** field (be aware of case, and brackets):
 - `{{apiRequest.pathParameters.lastName}}` was not found. Update cannot be completed.

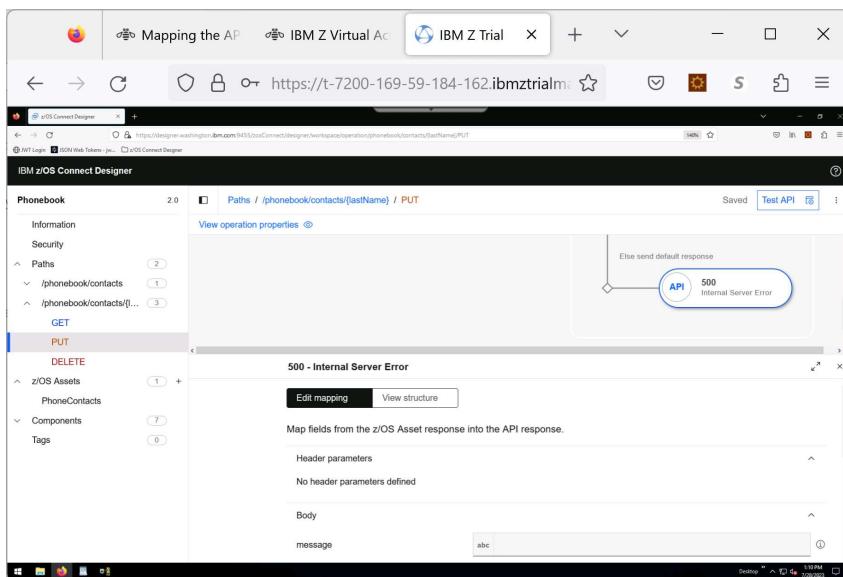


Note how the tooling pulls the lastName from the structure.

- Click **X** at the top right of this panel to close it and return to the Operations flow diagram.

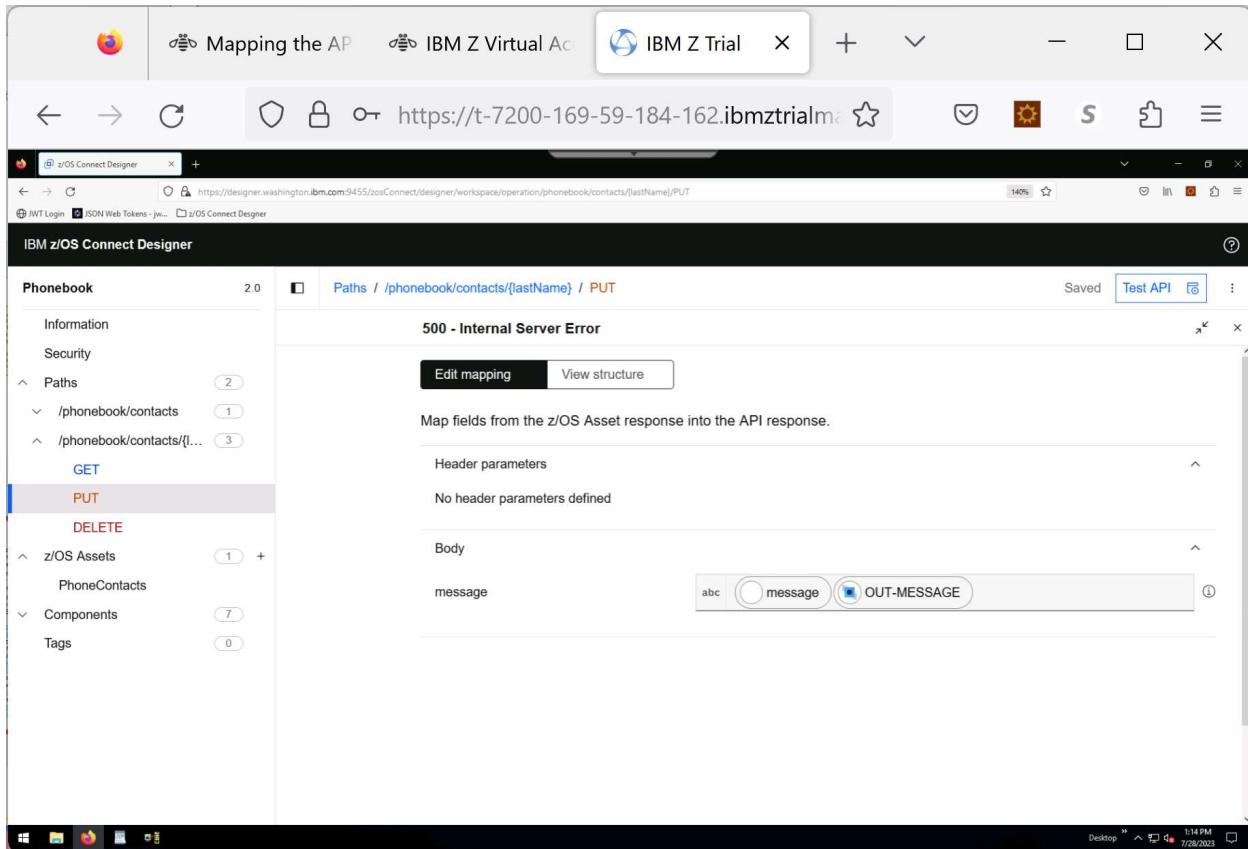
Map the 500 response.

Click on the **500** node to open up the mapping panel.



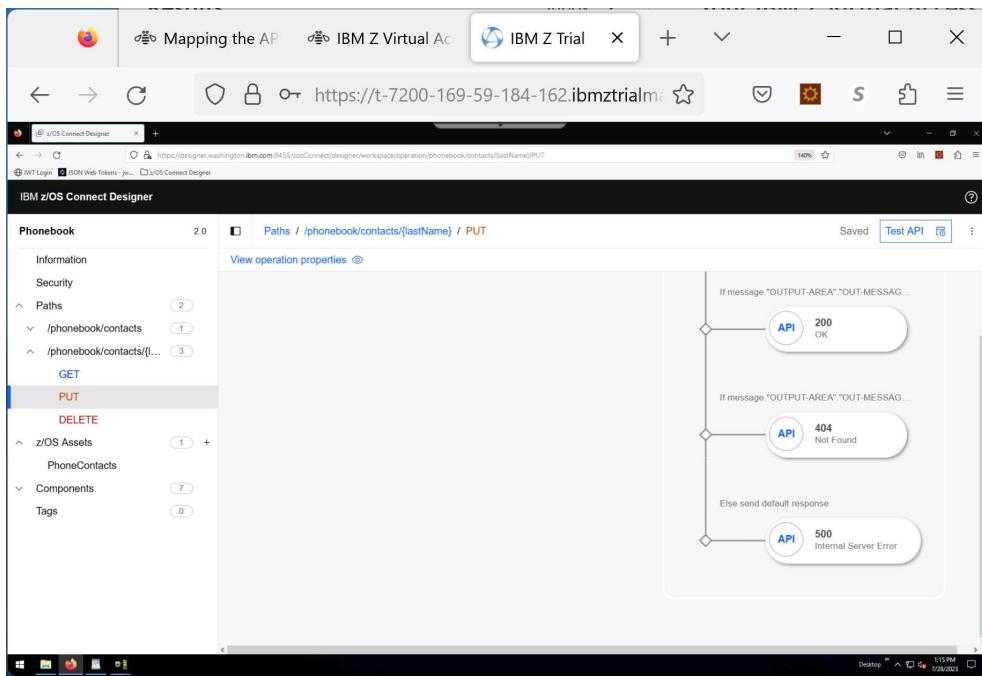
A 500 response code indicates an internal server error. Configure the 500 response to return the z/OS Connect error message by typing the following into the message field (Note the case, brackets, and quotes):

`{{$error.message}}{{$zosAssetResponse.message."OUTPUT-AREA"."OUT-MESSAGE"}}`



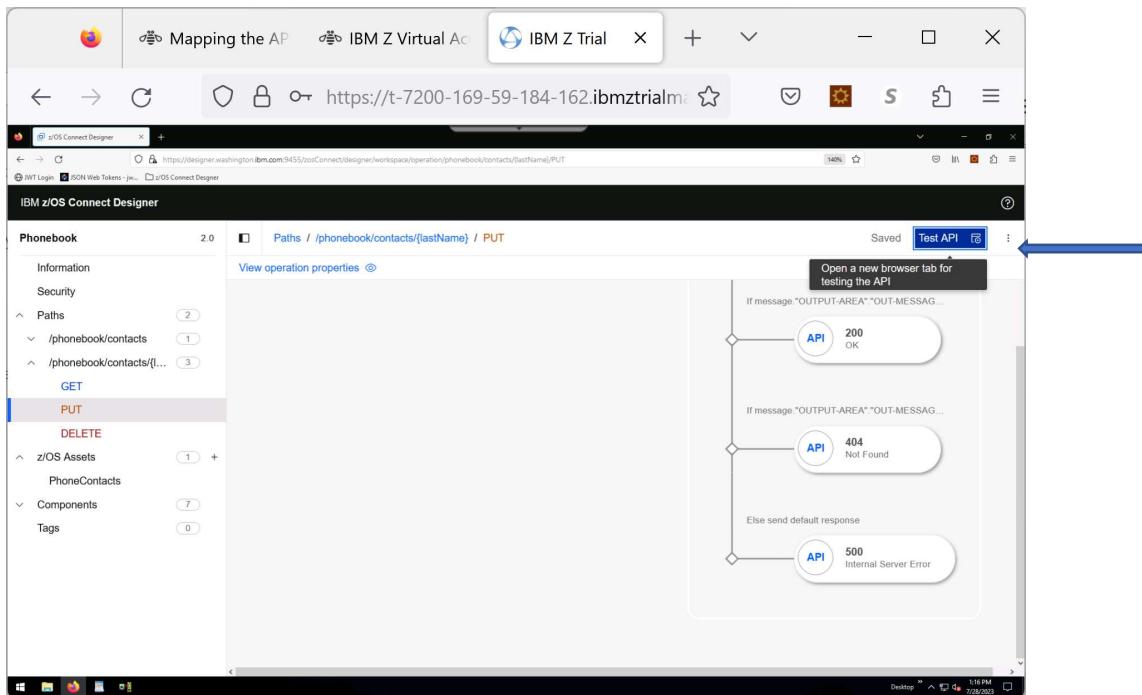
- Click **X** at the top right of this panel to close it and return to the Operations flow diagram.

Note that on the top right of the panel that your work have been **Saved** and that on the left, the **!** has disappeared by the PUT method.

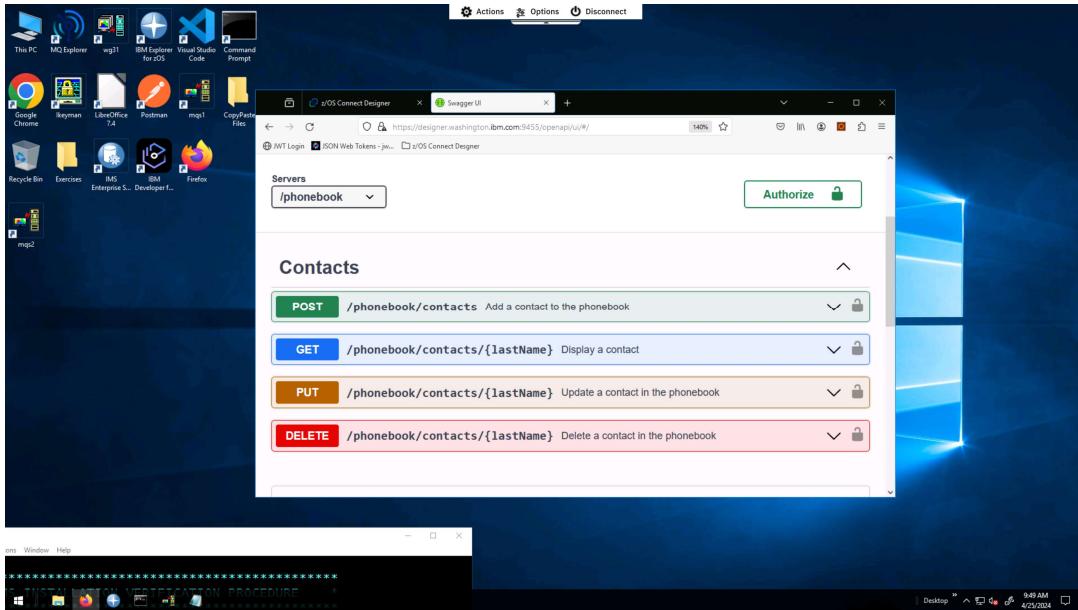


Test the API POST method.

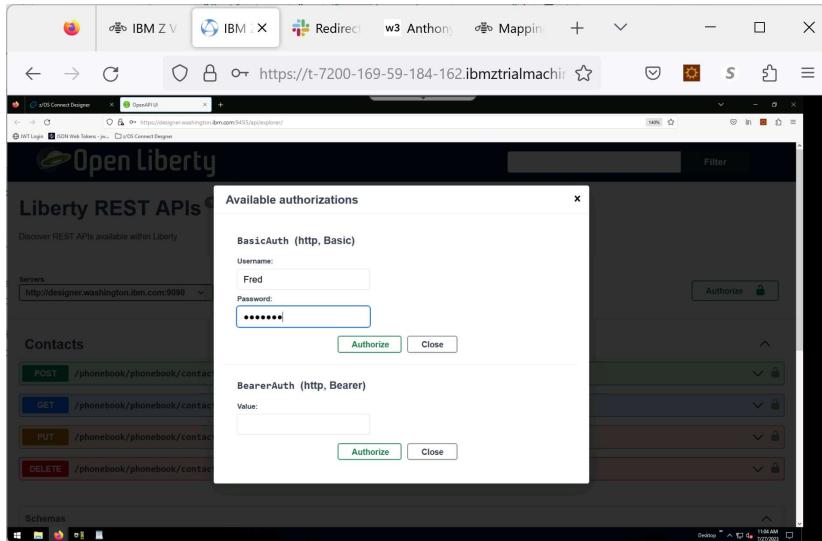
- Click on the **TEST API** button on the top right of the operations diagram.



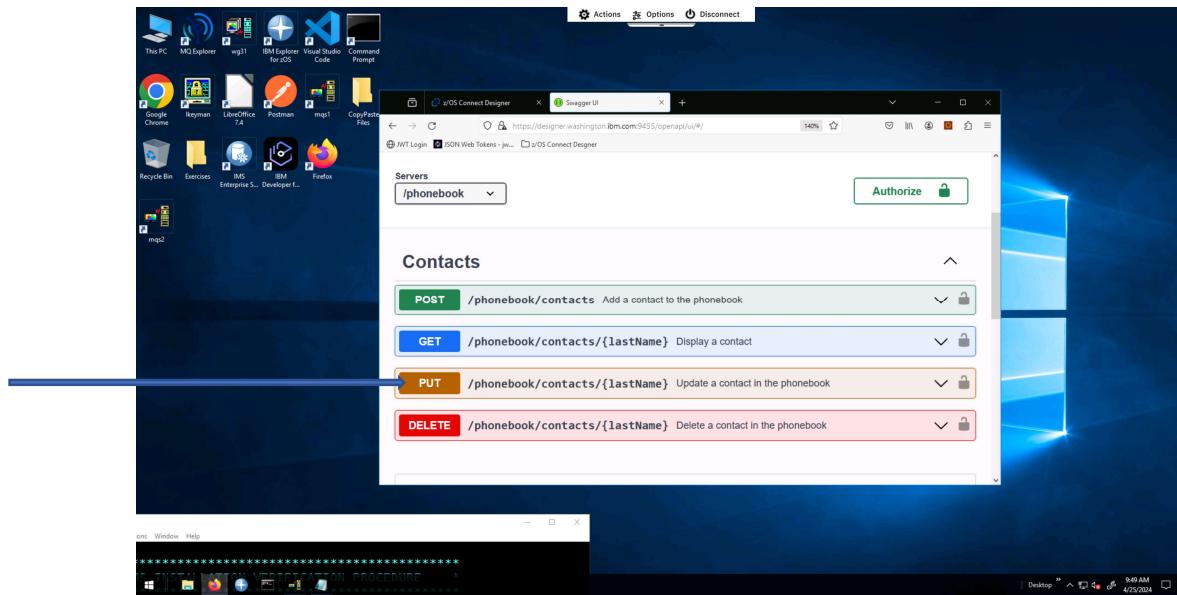
- On the **Servers** drop down, select **/phonebook**



- Click the **Authorize** button – use the BasicAuth
 - Select username **user1** or **Fred** if the options are there
 - Otherwise if the option is blank
 - Key in **Fred** (note the capital **F**) for the Username
 - Key in **fredpwd** (Note all lowercase) for the password
- Click **Authorize**.



Back on the main panel, you will see all the possible methods that can be used for this API. Select the **PUT** method.



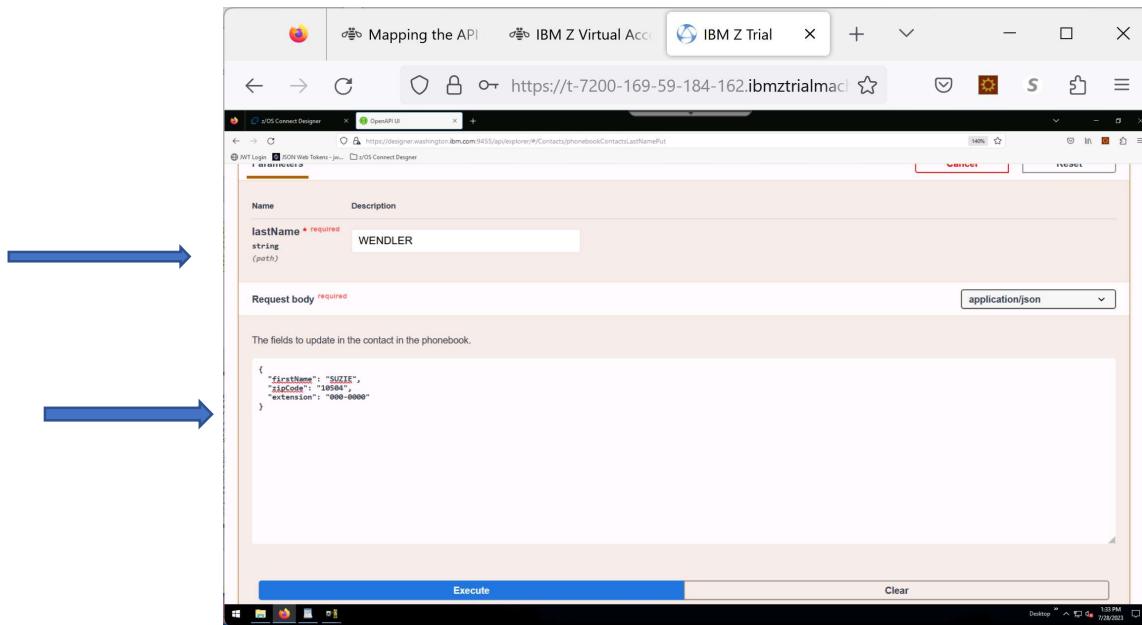
- Click **Try it out**

The screenshot shows a Firefox browser window with the URL <https://t-7200-169-59-184-162.ibmztrialmc.com>. The page is titled "z/OS Connect Designer". The "PUT /phonebook/phonebook/contacts/{lastName}" method is selected. The interface includes a "Parameters" section with a "lastName" parameter and a "Request body" section with an example value:

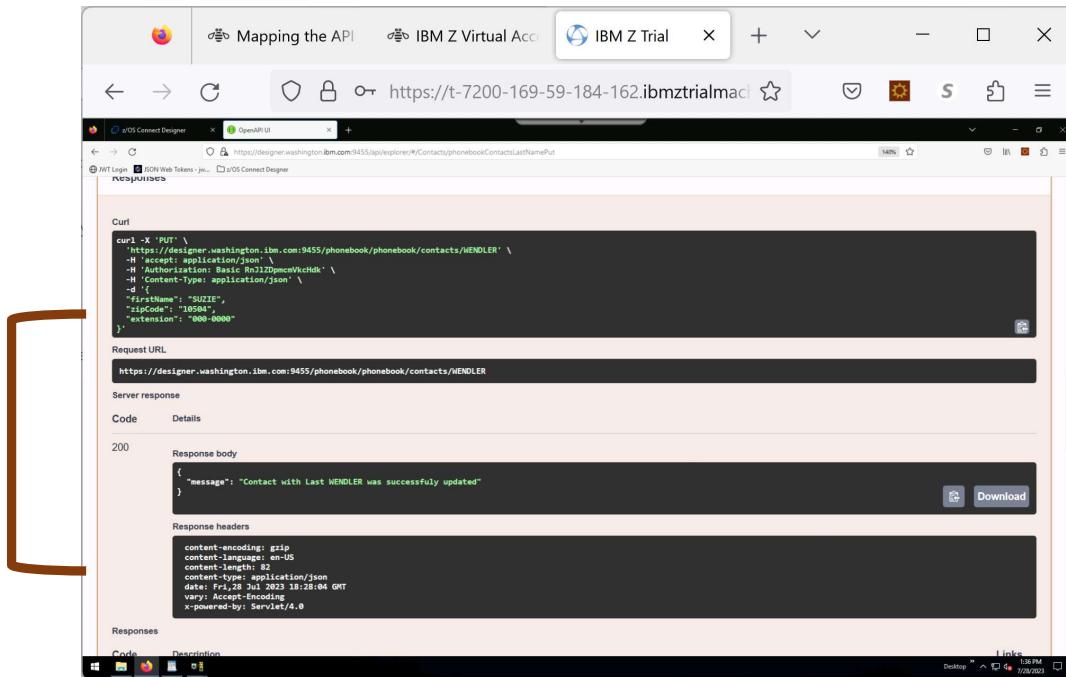
```
[{"firstName": "Trudi", "middleName": "L.", "lastName": "Hartman", "title": "Mrs.", "zipCode": "1050M", "extension": "0800-0000"}]
```

- Enter the lastName of the contact you want to UPDATE

- Key in any values you want to update for: `firstName`, `zipCode`, and `extension`. For Example:

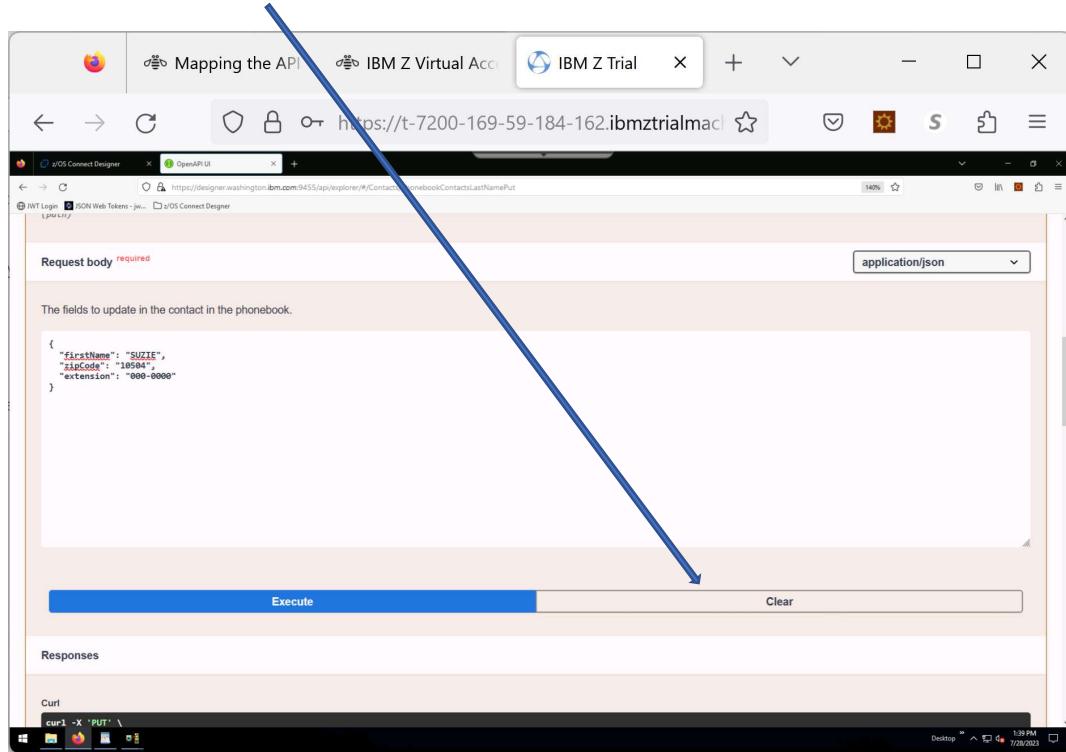


- Click **Execute**.
- You should see the following:

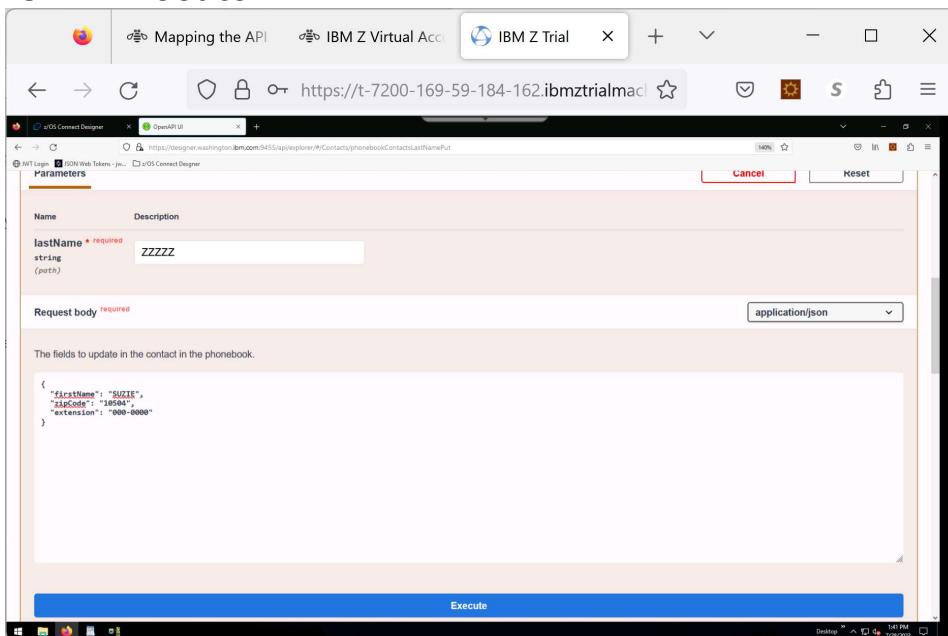


Note that the Response body of the 200 code shows a message including the Last Name that was UPDATED in the phonebook.

- Try to add the same information that you just added to see if the 409 code is returned
 - Click **Clear**



- Key in a last name that does not exist, e.g., zzzzzz
- Click **Execute.**



You will get the following 404 Error

The screenshot shows a Firefox browser window with three tabs open:

- Mapping the API
- IBM Z Virtual Acc
- IBM Z Trial (active tab)

The address bar shows the URL: <https://t-7200-169-59-184-162.ibmztrialmac>.

The main content area displays the following error response:

Server response

Code	Details
404	Error: Not Found

Response body

```
{ "message": "ZZZZZ was not found. Update cannot be completed." }
```

Response headers

```
connection: Close
content-encoding: gzip
content-language: en-US
content-length: 76
content-type: application/json
date: Fri, 21 Jul 2023 18:43:01 GMT
vary: Accept-Encoding
x-powered-by: Servlet/4.0
```

Responses

Code	Description	Links
200	OK	No links

Media type: application/json

Controls Accept header.

Example Value | Schema

- To test the **500** error code, the transaction IVTNO in IMS can be stopped. When that is done, executing the PUT will see the error.

The screenshot shows a Firefox browser window with three tabs open:

- Mapping the API
- IBM Z Virtual Acc
- IBM Z Trial (active tab)

The address bar shows the URL: <https://t-7200-169-59-184-162.ibmztrialmac>.

The main content area displays the following error response:

Request URL: <https://designer.washington.ibm.com:9455/phonebook/phonebook/contacts/ZZZZZ>

Server response

Code	Details
500	Error: Internal Server Error

Response body

```
{ "message": "BAQR1862E: Internal IMS z/OS Asset error." }
```

Response headers

```
connection: Close
content-encoding: gzip
content-language: en-US
content-length: 75
content-type: application/json
date: Fri, 21 Jul 2023 18:58:00 GMT
vary: Accept-Encoding
x-powered-by: Servlet/4.0
```

Responses

Code	Description	Links
200	OK	No links

Media type: application/json

Controls Accept header.

Congratulations! You have completed the exercise for the **PUT** method.