

Lab Guide

ServiceNow custom REST APIs:
Build Custom Services the right
way with Scripted REST APIs

Jason McKee

Lab instance: <http://clabs.link/custom-api-hyd>

Default Login / Password:

admin / hyd-cc17

itil / hyd-cc17

employee / hyd-cc17

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Lab Goal

Before we get started building custom services with Scripted REST APIs, we need to get our lab instance setup. In this lab you will be modifying an existing scoped application. Start out by importing the Polls Application from Source Control. Follow the directions below to fork this application to your GitHub account and begin working.

Lab Setup

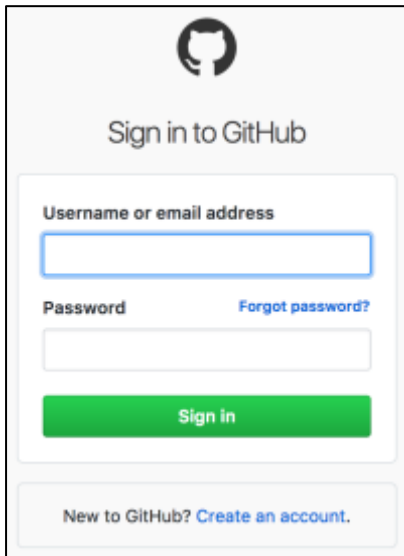
Prerequisites

In order to complete this lab, you must:

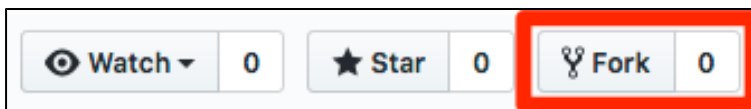
- Create a GitHub account, if you do not already have one.
- Install Postman from <https://getpostman.com> if you do not already have it.

Fork the Lab GitHub Repository

1. Log in to your GitHub account at <https://github.com/login>.

A screenshot of the GitHub sign-in page. At the top is the GitHub logo and the text "Sign in to GitHub". Below this is a form with two input fields: "Username or email address" and "Password". There is a "Forgot password?" link next to the password field. A green "Sign in" button is at the bottom of the form. Below the form is a link that says "New to GitHub? Create an account."

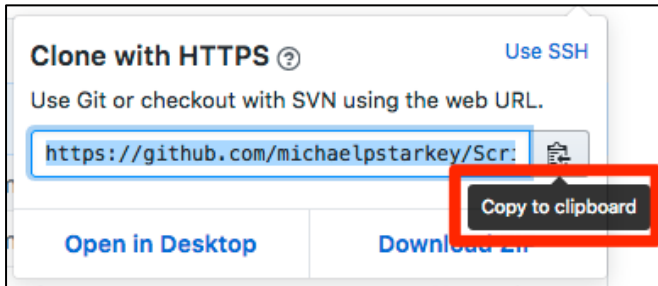
2. Navigate to: <https://github.com/balazsburgermeister/ScriptedRESTAPI>
3. Click **Fork**.



4. Note in the upper left that the repository has been copied to your account. You now have a copy of the lab material for reference after the conference!

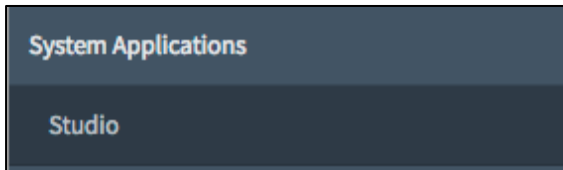
5. Locate and click on the **Clone or download** button and then click the clipboard to the right. This action copies the URL in the clipboard.

IMPORTANT: Be sure to copy the **HTTPS** repo URL in GitHub.

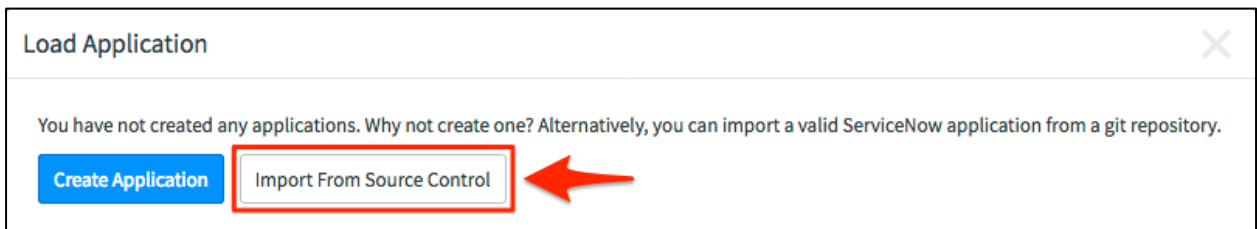


Import the Polls Application from Source Control

6. Log in to your instance with the credentials provided on the cover sheet of this document.
7. Navigate to **System Applications > Studio**.



8. Click **Import From Source Control**.



9. In the Import Application window, paste the URL copied in step 5 and provide your GitHub credentials. Click **Import**.

Import Application

Importing an application from source control will result in a new application being created in this ServiceNow instance based on the remote repository you specify. The account credentials you supply must have read access to the remote repository. The remote repository you specify must contain a valid ServiceNow application. For more information on requirements refer to ServiceNow product documentation.

* URL

User name

Password

10. When the import completes, click **Select Application**.

Import Application

✓ Success

Successfully applied commit 299d811fd0e5a275d5939f0c64aa4d2f9e1ce970 from source control

11. Click on the **Polls** application you just imported.

Load Application

Applications (1)

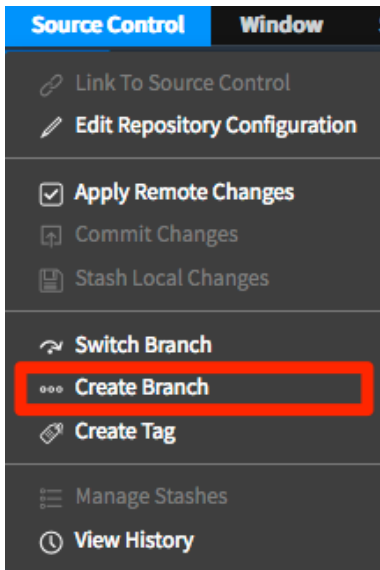
Filter...

Status	Application	Vendor	Version	Created on	Updated On ↓
	Polls		1.0.0	2016-04-18	2016-04-18 18:22:25

You've now successfully imported your forked version of the application for use in this workshop.

Get ready for Lab 1 – Create a new branch from Lab1-start tag in Studio

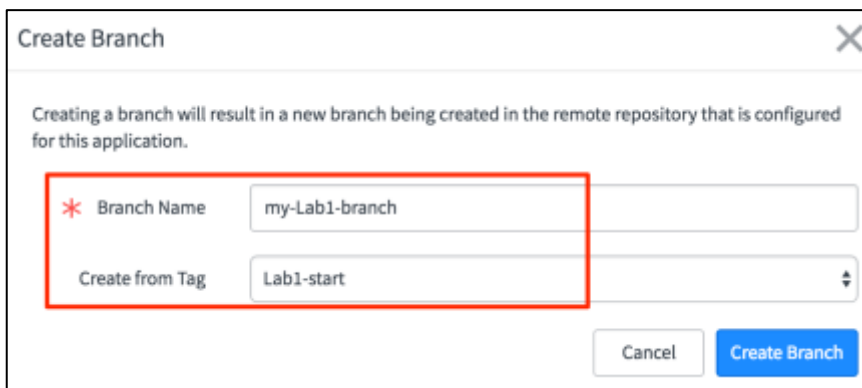
12. In **Studio**, navigate to **Source Control > Create Branch**.



13. In the pop-up window, enter a branch name, then select **Lab1-start** from the **Create from Tag** menu, and click **Create Branch**.

Branch: **my-Lab1-branch**

Create from Tag: **Lab1-start**



14. When the create is complete, click **Close Dialog** in the Create Branch pop-up.
15. Verify Studio is on branch **my-Lab1-branch** from the bottom right corner of the screen.



Lab setup is complete. You are now ready to start Lab 1.

Lab Goal

The purpose of this lab is to familiarize yourself with ServiceNow Scripted REST APIs. In this first lab you'll build a Scripted REST API that returns "Hello, world!" in response to a GET request. After building the API you'll use the ServiceNow REST API Explorer and API testing tool Postman to make requests to the REST API.

Prerequisite

- Knowledge of REST APIs
- Knowledge of HTTP clients
- Postman API testing tool. To get Postman go to: <https://www.getpostman.com/>

Lab 1 Build "Hello, world!"

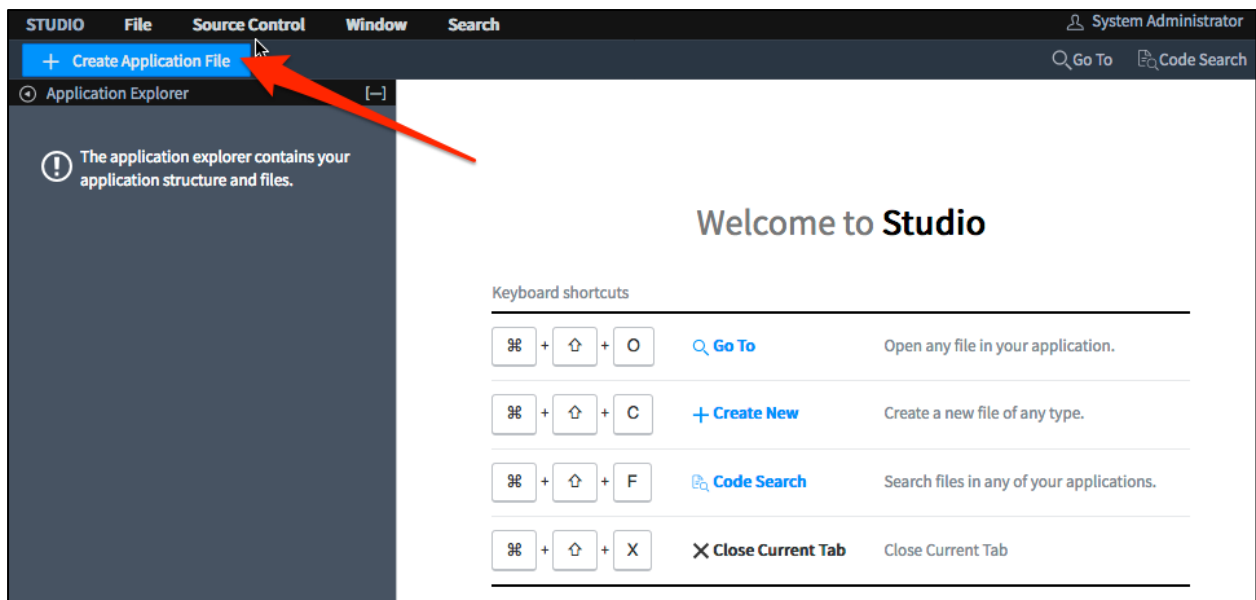
Create Lab 1 starting branch

1. If you completed the lab setup, proceed to the next step.

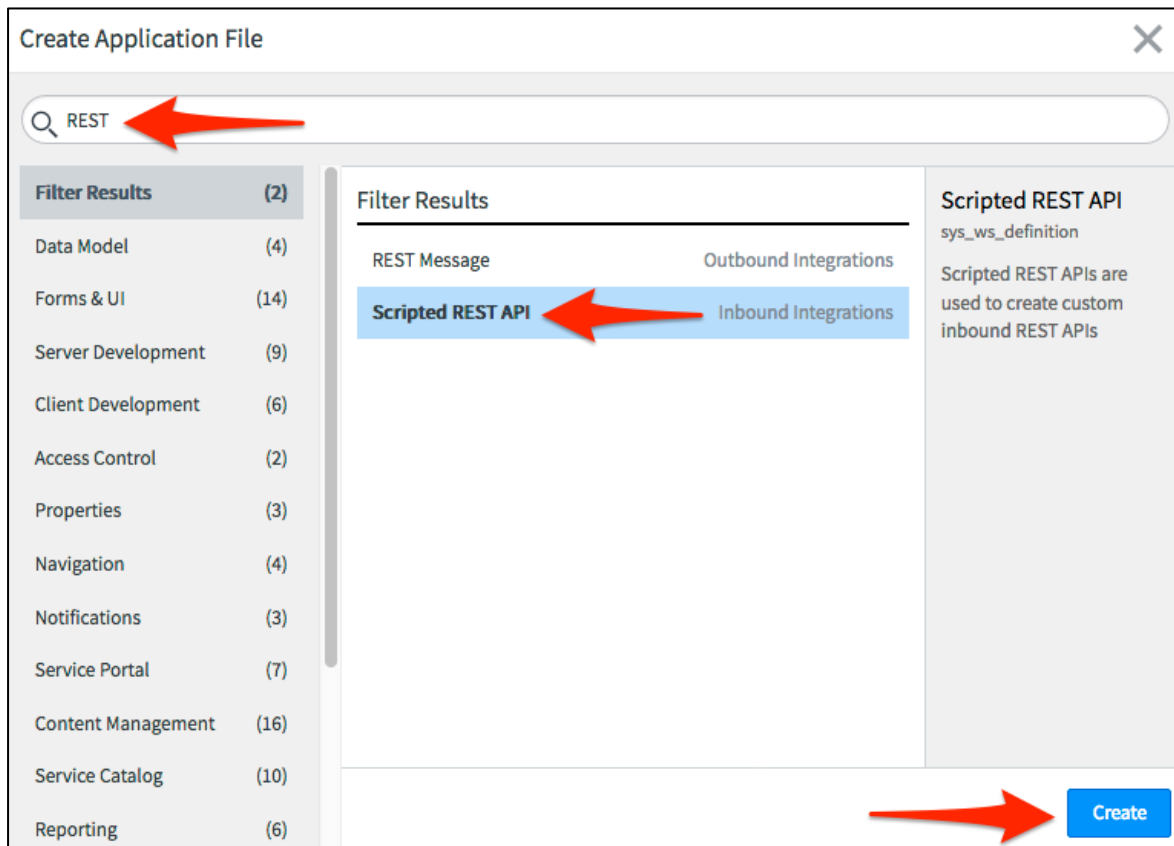
If you haven't yet completed lab setup, follow the steps in lab setup to create the **my-Lab1-branch** from the **Lab1-start** git tag.

Create the Hello World Scripted REST API

2. In Studio, click **Create Application File**.



3. In the **Create Application File** window, type **REST** in the filter then select **Scripted REST API** and click **Create**.



4. Give the **API** a name. Note the **API ID** populates automatically from the API Name, but can be changed.

Name: **Hello, world!**

Scripted REST Service
New record

You can easily create a new REST API. To get started, give your API a name and ID.

* Name
Hello, world!

Application
Polls

* API ID
hello_world

* API namespace
x_snc_polls

Protection policy
-- None --

Submit

Click **Submit**.

5. Add a **Resource** to the API by finding the **Resources** related list. Click **New**.

Related Links
[Enable versioning](#)
[Explore REST API](#)
[API analytics](#)

Resources Request Headers Query Parameters

Resources New

API definition = Hello, world!

Name HTTP method Relative path Resource path API version

No records to display

6. Specify the following properties for the new resource and complete the script.

Name: **Hello resource**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab1

The screenshot shows the configuration page for a 'Hello resource' in ServiceNow. The page has a header with the resource name and a 'Scripted REST Resource' label. Below this, there are several fields and sections:

- API definition:** A text field containing 'Hello, world!' with an information icon.
- Application:** A dropdown menu set to 'Polls' with an information icon.
- Name:** A text field containing 'Hello resource', highlighted with a red box and a red arrow pointing to it.
- Active:** A checkbox that is checked.
- HTTP method:** A dropdown menu set to 'GET'.
- Relative path:** A text field containing '/'.
- Resource path:** A text field containing '/api/x_snc_polls/hello_world'.
- Script:** A code editor with a toolbar. The script content is:

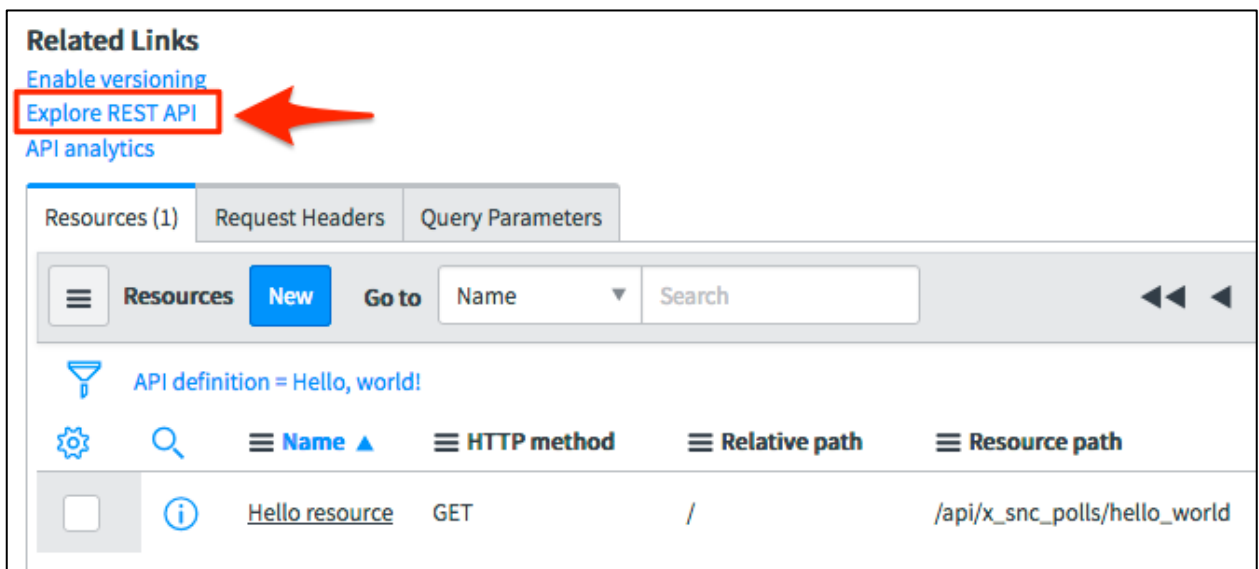
```
1 (function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {  
2   return "Hello, world!";  
3 })(request, response);
```

The line 'return "Hello, world!";' is highlighted with a red box and a red arrow pointing to it.
- Protection policy:** A dropdown menu set to '-- None --'.

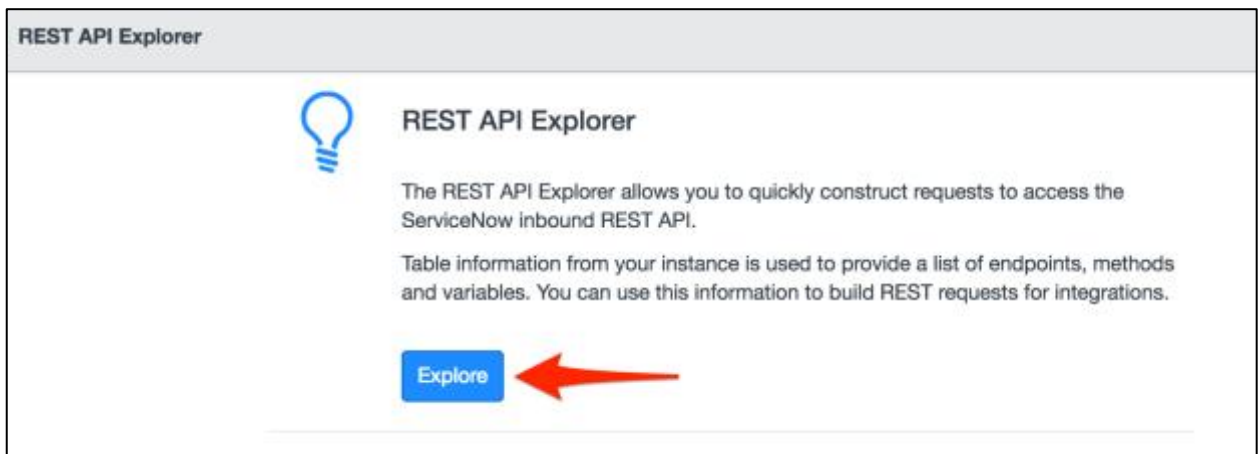
Click **Submit**.

Test with REST API Explorer

7. Click **Explore REST API**.



8. The **REST API Explorer** opens in a new browser window. Click **Explore**.



9. The “Hello, world!” Scripted REST API is pre-selected in the Explorer menus. Click **Send**.

REST API Explorer

Namespace
x_snc_polls

API Name
Hello, world!

API Version
latest

▶ Hello resource (GET)

Hello, world!

Hello resource

GET /api/x_snc_polls/hello_world

Prepare request

Query parameters

Add query parameter

Request headers

Name	Value	Description
Request format	application/json	Format of REST request body
Response format	application/json	Format of REST response body
Authorization	Send as me	Send the request as the current user or with another user's credentials


Add header

Send

[ServiceNow Script] [cURL] [Python] [Ruby] [JavaScript] [Perl] [Powershell]

10. Verify response status code is **200 OK** and response body is **"Hello, world!"**.

Request

HTTP Method / URI	GET  /api/x_snc_polls/hello_world
Headers	
Accept	application/json
X-UserToken	cbc451c1f51232007f4494386d91c994797a9010e7105820322bb160a4a94b657e7dcd0c

Response

Status code	200 OK
Headers	
Cache-control	no-cache,no-store,must-revalidate,max-age=-1
Content-encoding	gzip
Content-type	application/json;charset=UTF-8
Date	Fri, 21 Apr 2017 11:45:21 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-encoding	chunked
X-is-logged-in	true
Response Body	
<pre>{ "result": "Hello, world!" }</pre>	

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

11. Similar to creating the Lab1 starting branch, the completed lab can also be checked out from a tag (**Lab1-complete**) in Source control.
12. In **Studio**, navigate to **Source Control > Create Branch**.
13. In the pop-up window, enter a branch name, then select **Lab1-complete** from the **Create from Tag** menu, and click **Create Branch**.

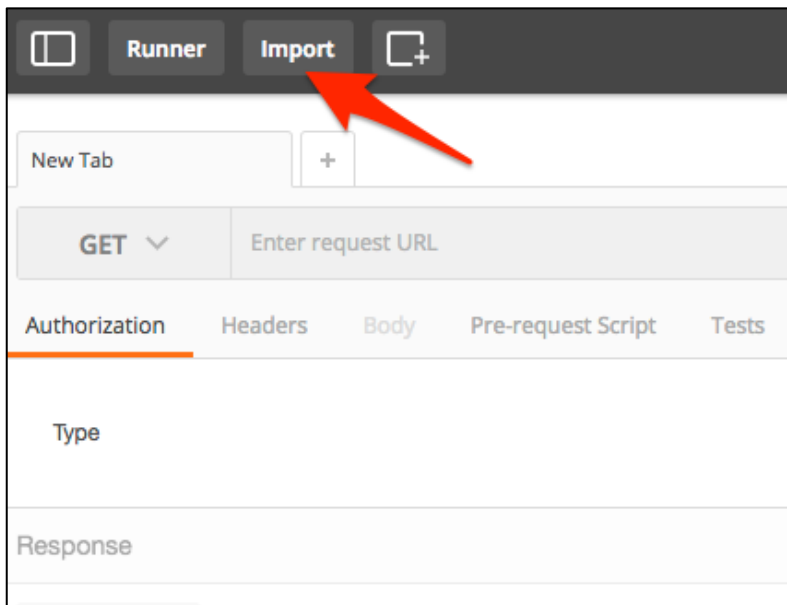
Branch: **my-Lab1-branch-complete**

Create from Tag: **Lab1-complete**

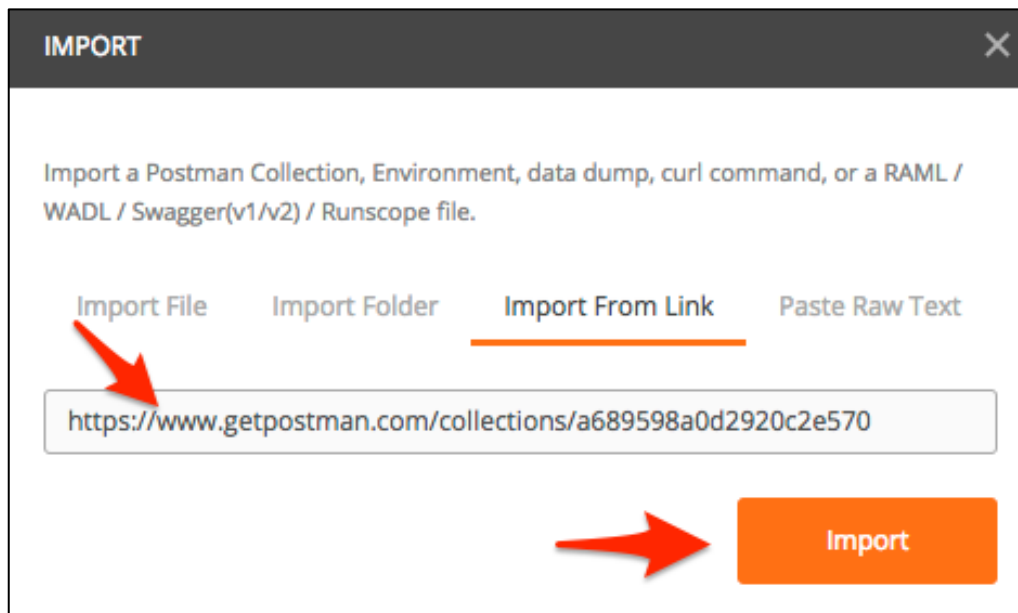
14. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
15. Verify Studio is on branch **my-Lab1-branch-complete**.
16. You are now ready to continue with the next section of **Lab 1**.

Test with Postman

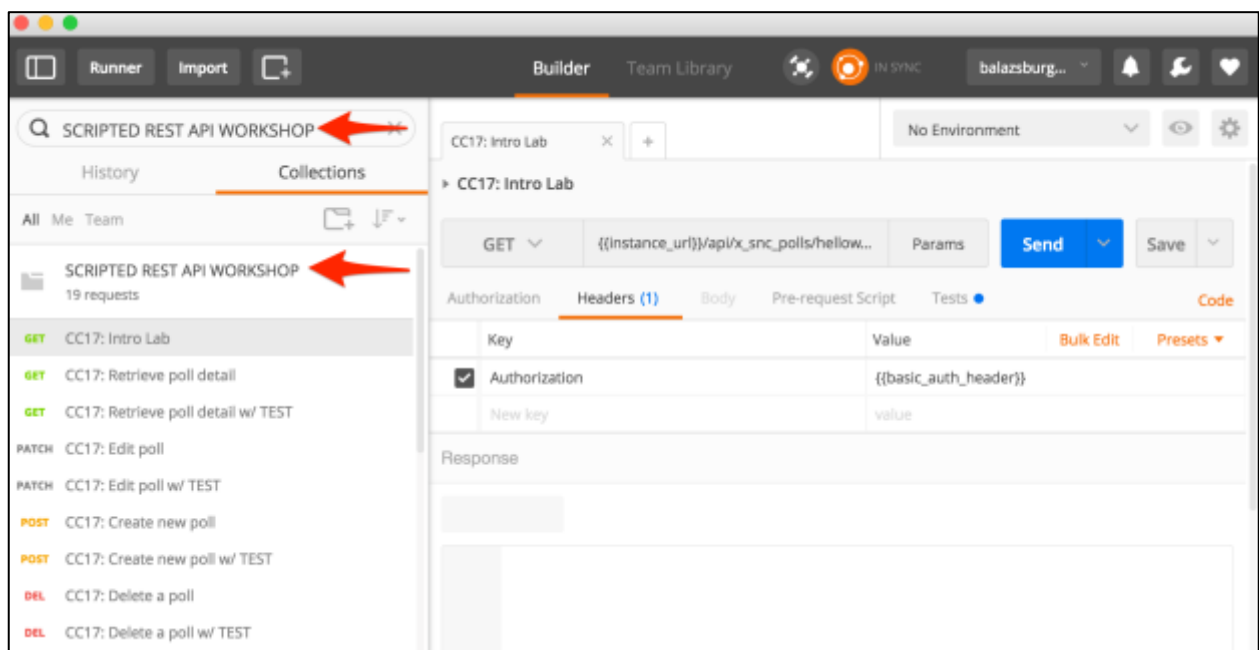
17. Open the **Postman** application on your laptop.
18. Import the Postman collection we will be using for this workshop from:
Postman Collection Link: <https://www.getpostman.com/collections/a689598a0d2920c2e570>
19. In Postman, click **Import**.



20. Paste the link to our Postman collection in the **Import from Link** and click **Import**.



21. Verify you have the “Scripted REST API Workshop” collection loaded by searching for it in the navigator on the left hand side.



22. In the **Scripted REST API Workshop** select the **CC17: Intro Lab**.

- a. Replace {{instance_url}} with your lab instance URL (for example, https://my_instance.lab.service-now.com), and replace the resource URI with the resource from your Hello World Scripted REST API. Copy/paste the resource path from the **Resource path** field.

The screenshot shows the configuration page for a 'Hello resource' in the 'Scripted REST Resource' section. The 'Resource path' field is highlighted with a red box and contains the value '/api/x_snc_polls/hello_world'. Other fields include 'API definition' (Hello, world!), 'Name' (Hello resource), 'HTTP method' (GET), 'Application' (Polls), 'Active' (checked), and 'Relative path' (/).

- b. Click **Update Request**.
- c. Click **Send** to send the HTTP request.

The screenshot shows the 'CC17: Intro Lab' request configuration page. Red arrows point to the 'Send' button (labeled 'c'), the 'Update Request' button (labeled 'b'), and the 'GET' method dropdown (labeled 'a'). The 'Send' button is blue, and the 'Update Request' button is orange. The 'GET' method is selected in the dropdown. The 'Resource path' field contains '/api/x_snc_polls/hello_world'. The 'Authorization' tab is selected, showing 'Basic Auth' type, 'admin' username, and 'Knowledge17' password. The 'Save helper data to request' checkbox is checked.

23. Validate response is successful by looking for the **200 OK** status code and message and that the response payload contains “Hello, world!”.

The screenshot displays a REST client interface for a request labeled "CC17: Intro Lab". The request method is GET, and the URL is `/api/x_snc_polls/hello_world`. The request is configured with Basic Auth, using the username "admin" and password "Knowledge17". The "Show Password" checkbox is checked. The "Update Request" button is visible. The response status is 200 OK, and the response time is 1332 ms. The response body is shown in the "Body" tab, displaying a JSON object: `{ "result": "Hello, world!" }`. A red arrow points to the "200 OK" status, and another red arrow points to the "result" field in the JSON payload.

CC17: Intro Lab

GET `/api/x_snc_polls/hello_world` Params Send Save

Authorization Headers (1) Body Pre-request Script Tests Code

Type Basic Auth Clear Update Request

Username admin The authorization header will be generated and added as a custom header

Password Knowledge17 ☒ Save helper data to request

☒ Show Password

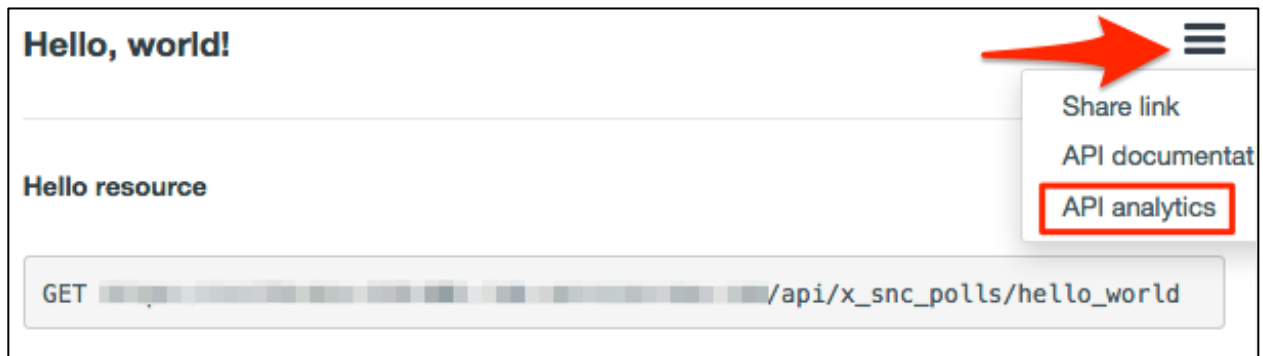
Body Cookies Headers (9) Tests (3/4) Status: 200 OK Time: 1332 ms

Pretty Raw Preview JSON Save Response

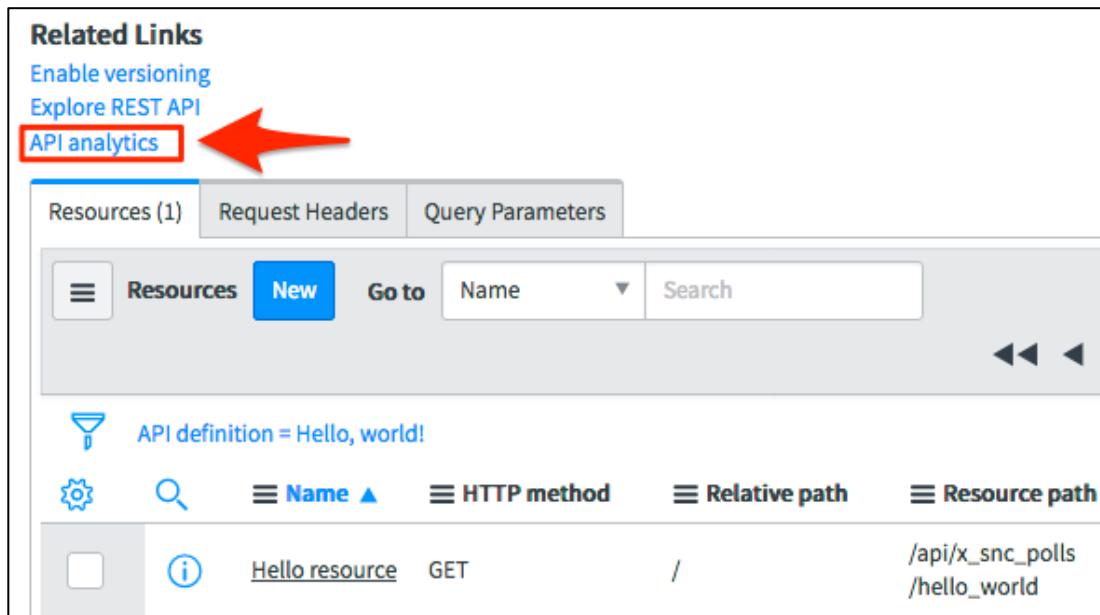
```
1 {
2   "result": "Hello, world!"
3 }
```

View API Analytics for Hello World

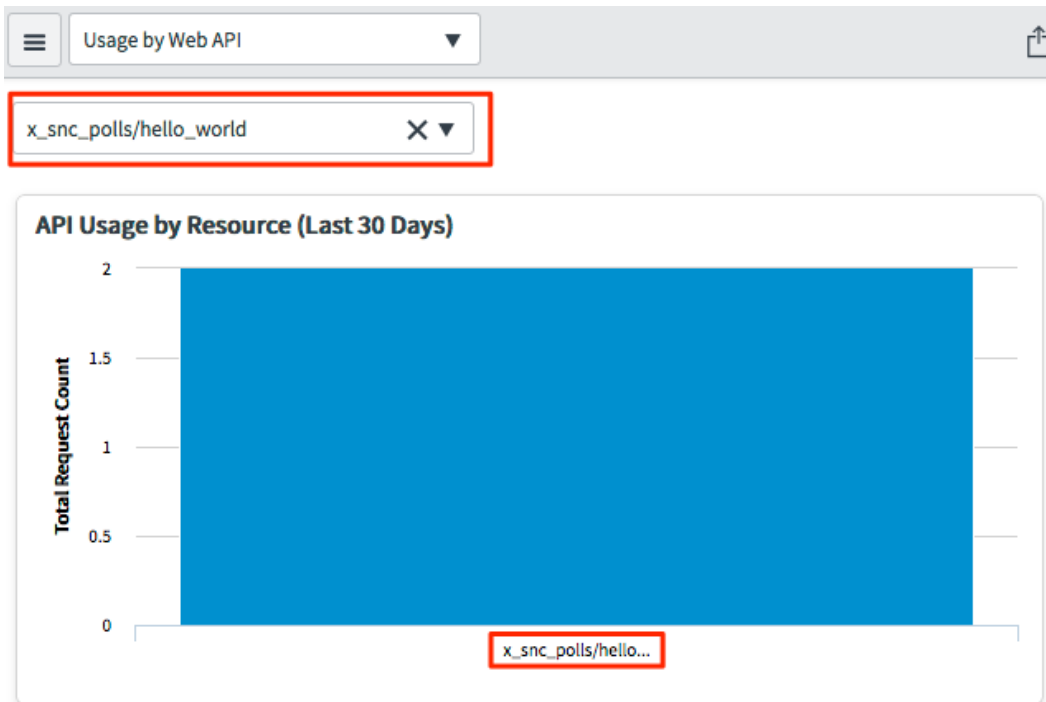
24. From **Explorer context menu**, or from Scripted REST API definition click **API Analytics**.



or



25. The **API Analytics** usage dashboard opens in a new browser tab, with the **Hello world** API pre-selected. Observe the API counts.



Note: There is up to a 60s delay between an API call and when it is reflected in API Analytics.

26. Close the REST API Explorer and API Analytics dashboard windows.

Lab 1 is complete. You are now ready to start lab 2.

Lab Goal

Having familiarized yourself with Scripted REST APIs in Lab 1, in Lab 2 we'll start building the "Polls" REST API that we'll use for the rest of this workshop. The Polls API you'll build provides a programmatic interface to interact with the Polls application on your ServiceNow instance.

The Polls app is a simple app that allows for the creation of Polls that allow participants to vote on answers to questions. Polls can have one or more questions associated with them. Questions can have one or more choices associated with them. As an example a simple poll could contain the question "What is your favorite color?". Choices that participants could choose would be; blue, red, yellow.

Lab 2 Building the Polls REST API

Create Lab 2 starting branch

1. In **Studio**, navigate to **Source Control > Create Branch**.
2. In the pop-up window, enter a branch name, then select **Lab2-start** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab2-branch**

Create from Tag: **Lab2-start**

3. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
4. Verify Studio is on branch **my-Lab2-branch**.
5. You are now ready to start **Lab 2**.

Create the Polls Scripted REST API

6. In Studio, click **Create New Application File**.
7. In the **Create New Application File** window, type **REST** in the filter then select **Scripted REST API** and click **Create**.
8. Give the **Scripted REST API** a name, then click **Submit**.

Name: **Poll**

API ID: **poll**

9. Click the related link **Enable versioning** to enable versioned URIs for the new API.

BEST PRACTICES

***Do:** Use versioning to control API changes.*

***Do:** Encourage clients to integrate against specific versions.*

***Don't:** Make breaking changes in an existing version.*

***Do:** Release a new API version when introducing new behaviors.*

Scripted REST Service
Polls

This form has annotations - click ? to toggle them - (click here to never show this again)

* Name Polls

* API ID polls

Active ☒

Protection policy -- None --

Security Content Negotiation Documentation

Default ACLs

Update Delete

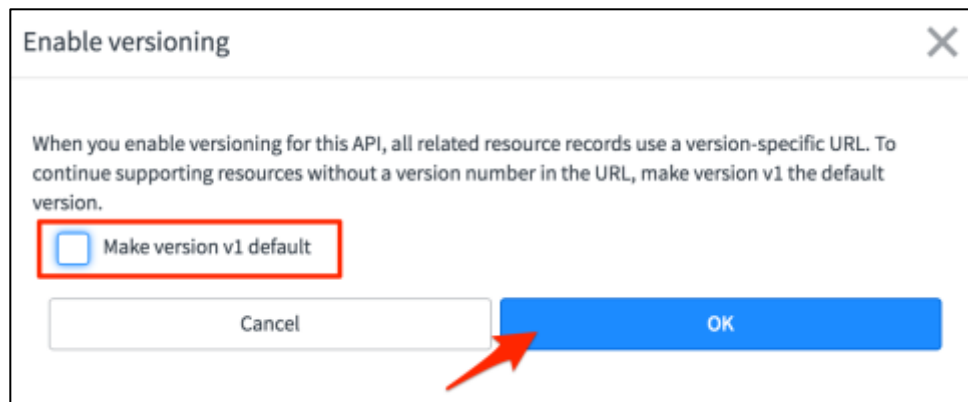
Related Links

[Enable versioning](#)

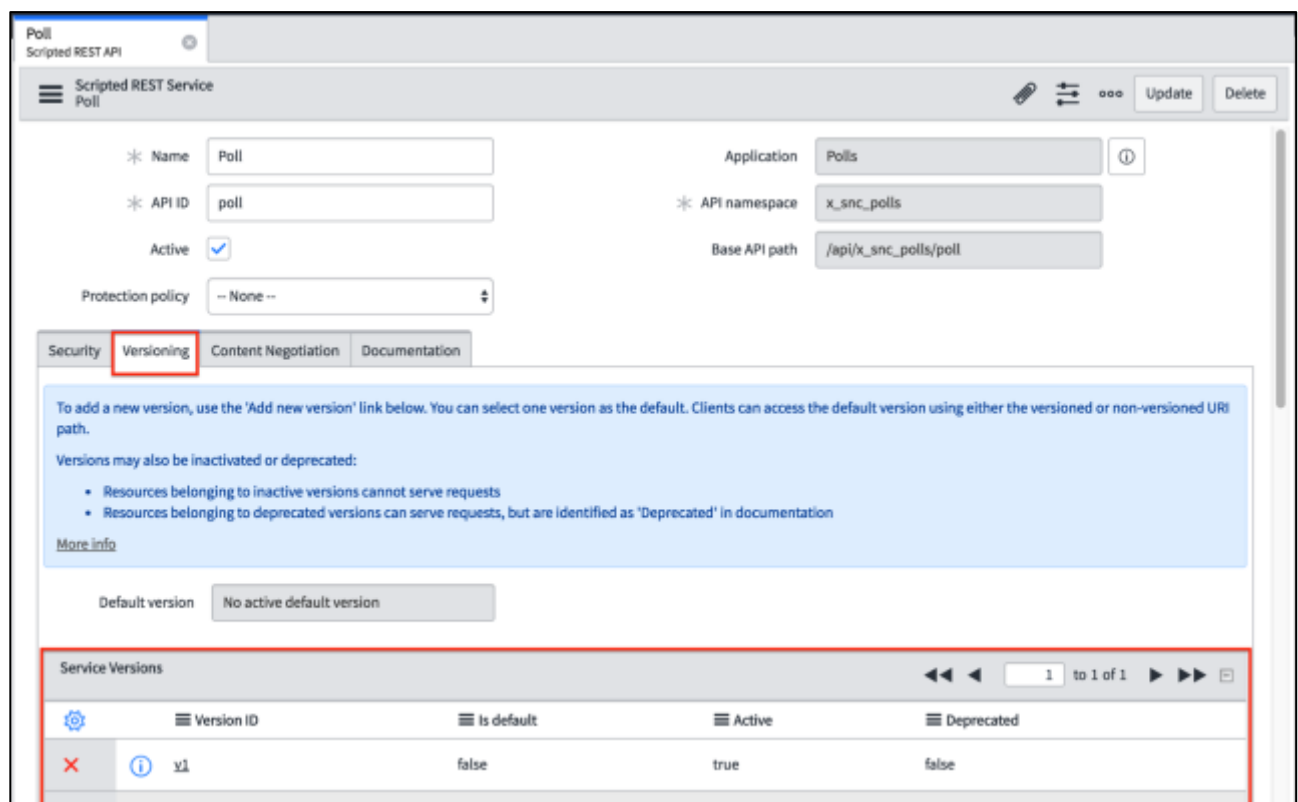
[Explore REST API](#)

[API analytics](#)

10. In the Enable versioning popup, uncheck the **Make version v1 default** checkbox, then click **OK**.



11. A new tab **Versioning** appears. Click to review the versioning tab contents.



Note: The API versions are maintained here. Deactivate versions, mark a version **Is default=true** to allow non-versioned URIs to route to that version, or don't define a default version to force clients to specify the version when making requests to the API.

12. Add a **Resource** to the API. Click **New** on the **Resources** related list.

This resource will return the details of a specific poll.

13. Specify the following properties for the new resource and complete the script.

Name: **Retrieve poll detail**

API Version: **v1**

HTTP method: **GET**

Relative path: **/poll_id**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab2_retrieve_poll_details

The screenshot shows the 'Retrieve poll details' configuration page in ServiceNow. The interface includes a top navigation bar with 'Scripted REST Resource' and 'Retrieve poll details' tabs. Below the navigation bar, there are several configuration fields:

- API definition:** Poll
- Name:** Retrieve poll details (highlighted with a red box)
- Application:** Polls
- API version:** v1 (highlighted with a red box)
- Active:** ☒

Below these fields is a section titled 'Request routing' with explanatory text and a 'More info' link. Under this section, the following fields are present:

- HTTP method:** GET (highlighted with a red box)
- Relative path:** /poll_id (highlighted with a red box)
- Resource path:** /api/x_snc_polls/v1/poll/{poll_id}

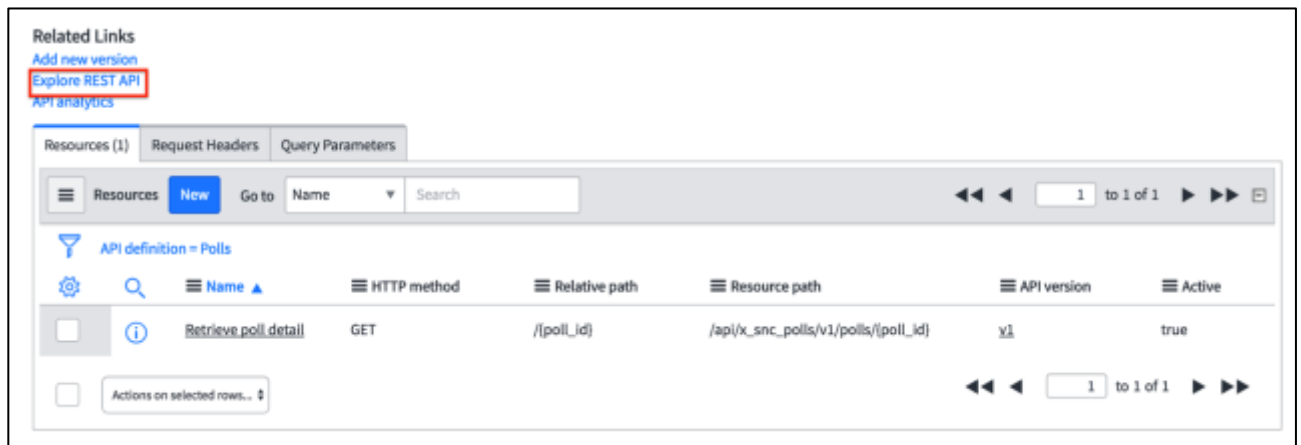
Below the 'Request routing' section is a section titled 'Implement the resource' with explanatory text and a 'More info' link. At the bottom, there is a 'Script' section with a code editor containing the following code:

```
1 {function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {  
2   var id = request.pathParams.poll_id;  
3 }
```

Click **Submit**.

Test with REST API Explorer

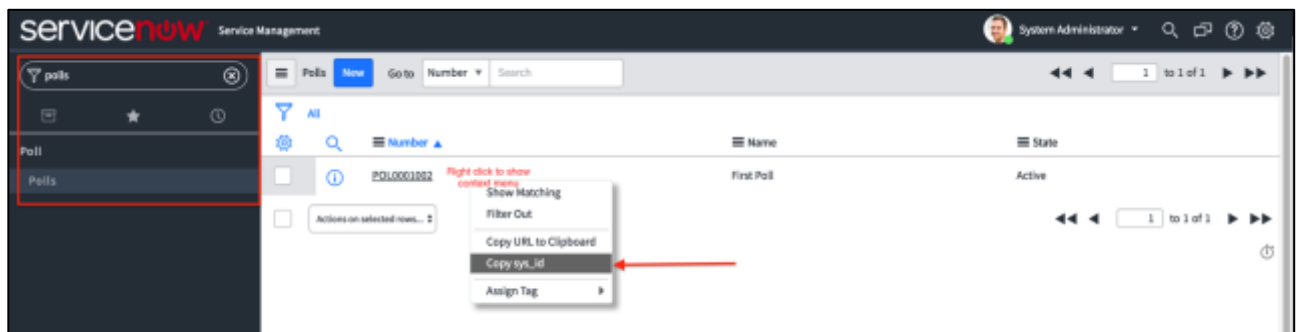
14. Click **Explore REST API**,



15. The **"Polls"** Scripted REST API is pre-selected in the Explorer menus and the **Retrieve Poll detail** resource is preselected.

16. Fill in sys id for a demo poll record and make a request.

To get the sys_id of demo record. Open the Polls module from navigator. Right click on existing record to copy sys_id.



17. Fill in the sys_id on the REST API Explorer.

REST API Explorer

Namespace: x_snc_polls
API Name: Poll
API Version: v1

Retrieve poll details (GET)

Poll

Retrieve poll details - Retrieve poll, questions, choices and votes polled by sysid

GET http://10.11.91.87:16001/api/x_snc_polls/v1/poll/{poll_id}

Prepare request

Path parameters

Name	Value
* poll_id	ddae64b9443a1200964fac543127a1ab

Click **Send**.

18. Verify the response status code is **200-OK**.

Response

Status code: 200 OK

Headers

Header	Value
Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Mon, 03 Apr 2017 03:47:21 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Strict-Transport-Security	max-age=15768000; includeSubDomains;
Transfer-Encoding	chunked
X-Is-Logged-In	true

Response Body

```
{
  "result": {
    "name": "First poll",
    "questions": [
      {
        "id": "2a46dae6134b1200ed373d62f244b041",
        "question": "Favorite number",
        "choices": [
          {
            "id": "3aa61ee6134b1200ed373d62f244b0dc",
            "choice": "3",
            "score": null
          }
        ]
      }
    ]
  }
}
```

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

19. Similar to creating the Lab2 starting branch, the completed lab can also be checked out from a tag (**Lab2-complete**) in Source control.
20. In **Studio**, navigate to **Source Control > Create Branch**.
21. In the pop-up window, enter a branch name, then select **Lab2-complete** from the **Create from Tag** menu, and click **Create Branch**.

Branch: **my-Lab2-branch-complete**
Create from Tag: **Lab2-complete**
22. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
23. Verify Studio is on branch **my-Lab2-branch-complete**.
24. You are now ready to continue with the next section of **Lab 2**.

Test with Postman

So far in this lab you’ve used Postman to make requests to ServiceNow REST APIs, Postman also allows you to write and execute tests that evaluate response from a REST API and provide you with Pass/Fail information based on your test and the response from the request. Let’s issue a request against the new resource **Retrieve poll detail** and write a few tests to verify the response we receive.

25. In Postman select the **CC17: Retrieve poll detail** request in the Scripted REST API Workshop collection. This request has been pre-built for you however you will need to update the `{{instance_url}}` and path including `{{poll_id}}` parameters in the URL replacing them with values from your lab instance. You will also need to update the Authorization section specifying your username and password.
 - instance_url: **URL of your lab instance**
 - poll_id: **Sys_id of a poll record in your lab instance**
 - Username: admin
 - Password: admin password for your lab instance

CC17: Retrieve poll detail

GET `{{instance_url}}/api/x_snc_polls/v1/poll/{{poll_id}}` Params Send Save

Authorization Headers (1) Body Pre-request Script Tests Code

Type Basic Auth Clear Update Request

Username admin

Password Knowledge17 ☒ Show Password

The authorization header will be generated and added as a custom header

☒ Save helper data to request

a. Replace `{{instance_url}}` with the URL of your lab instance (e.g., <https://mylabinstance.service-now.com>).

b. Replace `{{poll_id}}` with the sys_id of an existing Poll record in your ServiceNow instance.

26. After populating your credentials and replacing the parameters click **Update Request** and then **Send** the request.

27. Check that you've received a successful response. You should see a status of **200 OK** and a JSON payload that includes at least one poll as shown below.

CC17: Retrieve poll detail

GET `https://mylabinstance.service-now.com/api/x_snc_polls/v1/poll/3c265ae6134b...` Params Send Save

Authorization Headers (1) Body Pre-request Script Tests Code

Type Basic Auth Clear Update Request

Username admin

Password ***** ☐ Show Password

The authorization header will be generated and added as a custom header

☒ Save helper data to request

Status: 200 OK Time: 240 ms

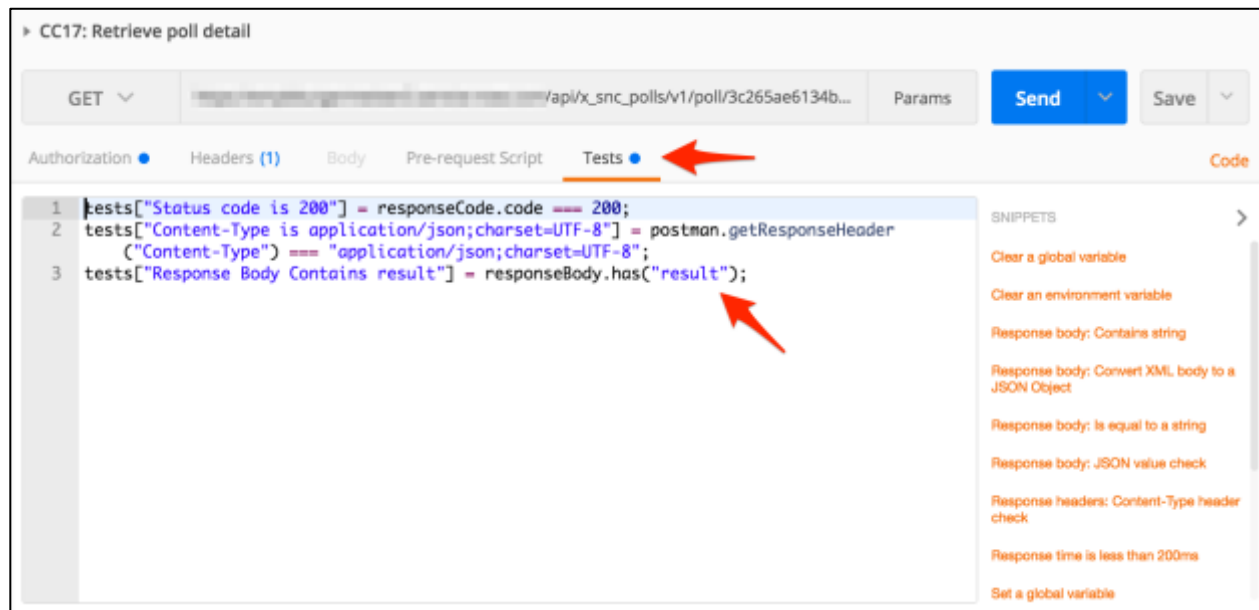
Pretty Raw Preview JSON Save Response

```

1 {
2   "result": {
3     "name": "First poll",
4     "questions": [
5       {
6         "id": "2a46dae6134b1200ed373d62f244b041",
7         "question": "Favorite number",
8         "choices": [
9           {
10            "id": "3a061ee6134b1200ed373d62f244b0dc",
11            "choice": "3",
12            "score": null
13          },
14          {
15            "id": "41a616e6134b1200ed373d62f244b0fc",

```

28. This request should return a status code of **200 OK**, with a JSON payload that represents the poll we requested. In addition the content-type header in the response should be **application/json; charset=UTF-8** and our JSON payload should contain a **result** object. Let's see how we can use Postman to verify this for us with tests that will be run as part of the request.
29. In Postman, in the CC:17 Retrieve poll detail request, open the **Tests** tab by clicking on **Tests**. Here you can specify tests that will be run as part of each request.



30. Postman has its own simple syntax for declaring tests. You can find out more about this syntax at the Postman website. For this lab we've provided you with 3 tests that validate that:
- the response status code is **200**
 - the response includes a content-type header with a value of **application/json; charset=UTF-8**
 - the response body contains the text '**result**'
31. Now update your request in Postman to run these tests. Copy the test script from the following URL and paste it into the **Tests** area in Postman.
- Postman test script: http://bit.ly/CC17_ScriptedRESTAPI_Lab2_postman_test_script

32. After copying click **Send** to issue the request. Now that we have tests specified as part of our request test results will be displayed in the response area. If all tests passed you will see a '**3/3**' in the header and then a green **PASS** image next to each test as shown below.



Save your request in Postman. You now have a saved request in Postman that allows you to easily issue a request to your 'Retrieve poll detail' resource and which will run test the response to validate that it includes the correct status code, header, and payload content. These were simple test cases but Postman will allow you to define more advanced test cases to verify you are receiving the correct response from your REST API.

BEST PRACTICES

Do: Define test cases for each of your APIs resources to validate that the response is formatted correctly and that the response contains the intended content. Building test cases as part of your development process will help insure you're building the API as you designed it and provide you with a set of tests that can be run over time as you make changes to guarantee that your interface has not changed unintentionally.

33. Close the REST API Explorer and API Analytics dashboard windows.

Lab 2 is complete. You are now ready to begin lab 3.

Lab Goal

In Lab 3 you'll continue building out the REST API for the **Polls** application adding resources to support creating a new poll, editing an existing poll, and voting in a poll. In building out this additional functionality you will further use and familiarize yourself with the Request and Response APIs that allow you to interact with the request that your REST API receives and build the response that your REST API will return.

Lab 3 Request & Response API

Create the Lab 3 starting branch

1. In Studio, navigate to Source Control > Create Branch.
2. In the pop-up window, enter a branch name, then select Lab3-start from the Create from **Tag menu**, and click **Create Branch**.

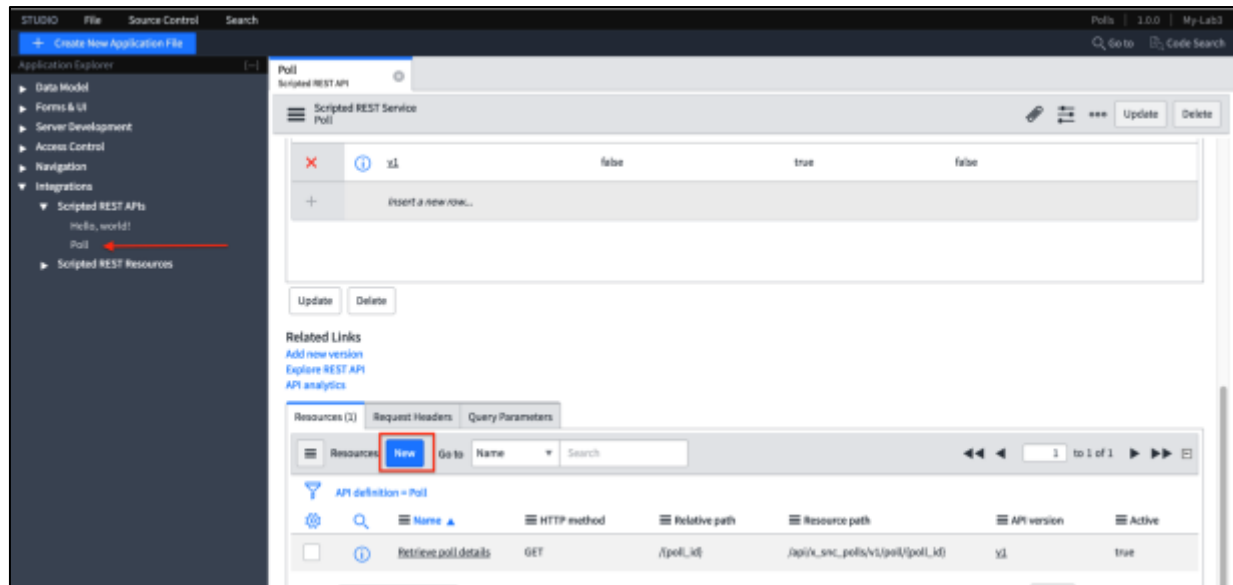
Branch: **my-Lab3-branch**

Create from Tag: **Lab3-start**

3. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
4. Verify Studio is on branch **my-Lab3-branch**.
5. You are now ready to start **Lab 3**.

Create New Resource in Polls API - Create a poll

6. The 'Create a poll' resource will be used to create a new poll in the 'Polls' application. Open the Polls API in studio and click **New** on the **Resources** related list to create a new resource.



7. Specify the following properties for the new resource.

Name: **Create new poll**

API Version: **v1**

HTTP method: **POST**

Relative path: **/**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab3_create_new_poll

Create new poll
Scripted REST Resource

< Scripted REST Resource
New record

* API definition Poll ⓘ

* Name Create new poll

Application Polls ⓘ

* API version v1 ⓘ

Active ☒

Request routing

The route configuration specifies the 'HTTP method' and 'Relative path'. These fields determine how HTTP clients access this resource.

The relative path identifies the sub-path to this resource relative to the base API path. The relative URI can contain path parameters such as '/abc/{id}'. The requesting client specifies the id value, available to the script at runtime via the: [Request API](#).

[More info](#)

* HTTP method POST

Relative path /

Implement the resource

Access request details including URI path parameters, query parameters, headers, and the request body using the: [Request API](#).

Configure the response including setting the HTTP status code, response body, and any response headers using the: [Response API](#).

[More info](#)

* Script

```
1+ {function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {  
2  var data = request.body.data;  
3  var pollHelper = new x_snc_polls.PollData_Creator();  
4  var groupId = getUserGroupId(data.usergroup);  
5  
6  // Create Poll record  
7  var pollRecord = pollHelper.createPoll(data, groupId);  
8  
9  // Create poll record and return
```

Click **Submit**.

Test with REST API Explorer

8. Open 'Create new poll' resource and Click **Explore REST API**.

The screenshot shows the 'Create new poll' resource page in the REST API Explorer. The page title is 'Create new poll' with a sub-header 'Scripted REST Resource'. Below the title, there are navigation icons and buttons for 'Update' and 'Delete'. A blue informational box contains text about security settings: 'Resources can specify security settings that override the parent settings. By default resources 'Require authentication' but do not 'Require ACL authorization'. To make a resource public, meaning no authentication is required to access the resource, uncheck 'Requires authentication'. To require authorization, select the 'Requires ACL authorization' check box and select an ACL record(s). Leave the 'ACL' field blank to enforce the 'Default ACLs' from the parent API. Access is granted if at least one matching ACL record is found. More info'. Below this box, there are two checkboxes: 'Requires authentication' (checked) and 'Requires ACL authorization' (unchecked). There are 'Update' and 'Delete' buttons. A 'Related Links' section contains a link 'Explore REST API' which is highlighted with a red box. Below this, there are tabs for 'Request Header Associations' and 'Query Parameter Associations'. The 'Request Header Associations' tab is active, showing a table with columns: 'API resource = Create new poll', 'API request header', 'Example value', and 'Is required'. The table is empty, and a message 'No records to display' is shown at the bottom.

Create new poll
Scripted REST Resource

< ≡ Scripted REST Resource
Create new poll

Update Delete ↑ ↓

Resources can specify security settings that override the parent settings.
By default resources 'Require authentication' but do not 'Require ACL authorization'. To make a resource public, meaning no authentication is required to access the resource, uncheck 'Requires authentication'.
To require authorization, select the 'Requires ACL authorization' check box and select an ACL record(s). Leave the 'ACL' field blank to enforce the 'Default ACLs' from the parent API. Access is granted if at least one matching ACL record is found.
[More info](#)

Requires authentication ☒ Requires ACL authorization ☐

Update Delete

Related Links
[Explore REST API](#)
[API analytics](#)

Request Header Associations Query Parameter Associations

Request Header Associations New Search for text Search

API resource = Create new poll

API request header Example value Is required

No records to display

9. **Create New poll** resource is shown in the REST API Explorer. Fill in request body in the raw tab under Request body section.

The screenshot shows the REST API Explorer interface. On the left, the 'Namespace' is 'x_snc_polls', 'API Name' is 'Poll', and 'API Version' is 'v1'. A red box highlights the 'Create new poll (POST)' link. The main panel shows the 'Poll' resource with a 'Create new poll' section containing a POST URL: 'http://10.11.91.87:16061/api/x_snc_polls/v1/poll'. Below this is the 'Prepare request' section with 'Query parameters' and 'Request headers' tabs. The 'Request headers' tab is active, showing a table with columns 'Name', 'Value', and 'Description'. The table has three rows: 'Request format' with value 'application/json', 'Response format' with value 'application/json', and 'Authorization' with value 'Send as me'. There is an 'Add header' button at the bottom.

A sample request payload can be found at:

http://bit.ly/CC17_ScriptedRESTAPI_Lab3_create_new_poll_sample_request

10. Copy the sample payload into the 'Raw' tab.

The screenshot shows the 'Request Body' section of the REST API Explorer. The 'Raw' tab is selected, indicated by a red arrow. A red box highlights the sample JSON payload in the text area. The payload is:

```
{  "usergroup": "Software",  "questions": [{    "question": "what is your favorite car",    "choices": [{      "choice": "Audi"    }, {      "choice": "BMW"    }, {      "choice": "Corvette"    }, {      "choice": "Tesla"    }    ]  }  ]}
```

 At the bottom, there are 'Send' and 'Clear response' buttons, and a row of links for different scripting languages: [ServiceNow Script], [cURL], [Python], [Ruby], [JavaScript], [Perl], and [Powershell].

Click **Send**.

11. Verify response status code is **201 Created**

Response

Status code	201 Created
-------------	--------------------

Headers

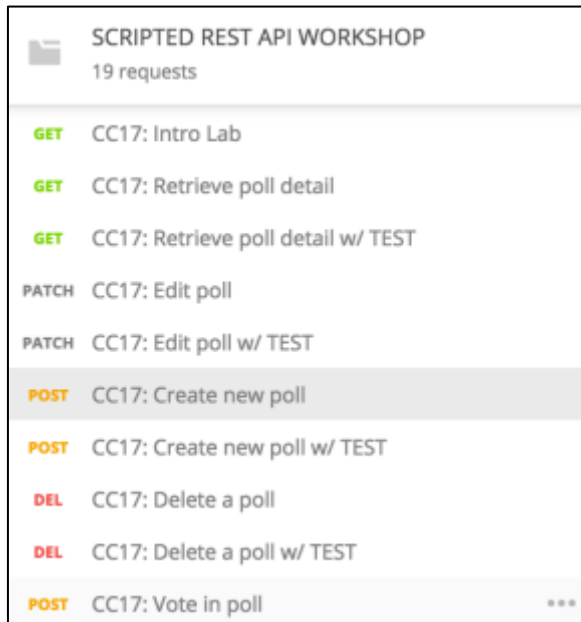
Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 15:55:46 GMT
Expires	0
Location	http://10.11.91.87:16001/api/x_snc_polls/v1/poll/83e342dab1321200964f2e4c16efa08f
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true

Response Body

```
{
  "result": {
    "number": "POL0001001",
    "name": "Second poll"
  }
}
```

Create tests in Postman

12. In Postman select the 'CC17: Create new poll' request'. This is a pre-built request that already contains an appropriately formatted payload for the 'Create new poll' resource.



13. Update the request replacing the `{{instance_url}}` and authorization credentials appropriate for your lab instance. Use your admin credentials for this request. Once you've updated those values save and then send the request.
14. As you saw when you tested with the REST API Explorer a successful response will include a **201** status code, a JSON payload that includes the number for the newly created poll, and the response headers include a 'Location' header that provides the URL for this newly created record. Let's add tests in Postman that verify that the following details for in the response:
- Response status code is 201
 - Response headers include Location
 - Response headers include Content-Type of application/json;charset=UTF-8
 - Response body contains the text 'number'
 - Response body contains the text 'name'

Update the request in Postman to include the following:

```
tests["Status code is 201"] = responseCode.code === 201;
tests["Location Header is present"] = postman.getResponseHeader("Location");
tests["Response Body Contains number"] = responseBody.has("number");
tests["Response Body Contains name"] = responseBody.has("name");
tests["Content-Type is application/json;charset=UTF-8"] = postman.getResponseHeader("Content-Type") ===
"application/json;charset=UTF-8";
```

For ease you can also copy these from:

http://bit.ly/CC17_ScriptedRESTAPI_Lab3_create_new_poll_test_script

15. After adding the tests above save your request in Postman and Send the request. In the response you should see the following tests and results.

The screenshot displays the Postman interface for a POST request. The URL is `https://[redacted].service-now.com/api/x_snc_global_polls/v1/poll`. The 'Tests' tab is active, showing the following JavaScript code:

```
1 tests["Status code is 201"] = responseCode.code === 201;
2 tests["Location Header is present"] = postman.getResponseHeader("Location");
3 tests["Content-Type is application/json;charset=UTF-8"] = postman.getResponseHeader
  ("Content-Type") === "application/json;charset=UTF-8";
4 tests["Response Body Contains number"] = responseBody.has("number");
5 tests["Response Body Contains name"] = responseBody.has("name");
```

Below the code editor, the 'Tests (5/5)' tab shows the results of the tests, all of which passed:

- PASS** Status code is 201
- PASS** Location Header is present
- PASS** Content-Type is application/json;charset=UTF-8
- PASS** Response Body Contains number
- PASS** Response Body Contains name

The status bar at the bottom indicates 'Status: 201 Created' and 'Time: 284 ms'.

Create New Resource in Polls API – Edit poll

The 'Edit poll' resource will be used to modify an existing poll record in the 'Polls' application.

16. Open the Polls API in studio and click New on the Resources related list to create a new resource.

17. Specify the following properties for the new resource.

Name: **Edit poll**

API Version: **v1**

HTTP method: **PATCH**

Relative path: **/poll_id**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab3_edit_poll

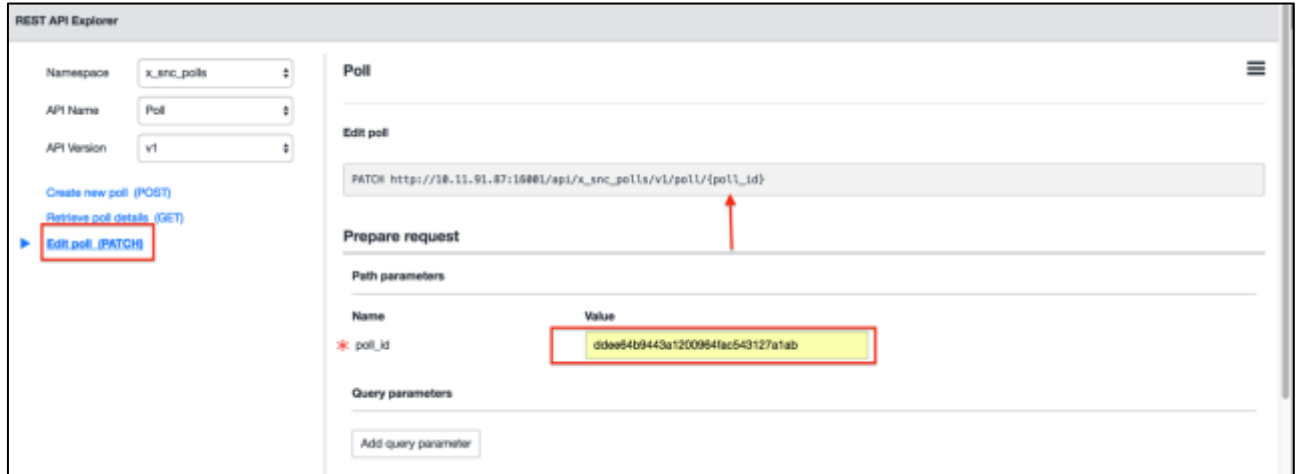
The screenshot shows the 'Scripted REST Resource' configuration page for 'Edit poll'. The page has a header with a back arrow, a menu icon, the title 'Scripted REST Resource Edit poll', and action buttons 'Update', 'Delete', and navigation arrows. The main content area is divided into two columns. The left column contains 'API definition' (set to 'Poll') and 'Name' (set to 'Edit poll', highlighted with a red box). The right column contains 'Application' (set to 'Polls') and 'API version' (set to 'v1', highlighted with a red box). Below these is an 'Active' checkbox which is checked. A blue box titled 'Request routing' contains explanatory text about HTTP methods and relative paths. Below this, the 'HTTP method' is set to 'PATCH' (highlighted with a red box) and the 'Relative path' is set to '/poll_id' (highlighted with a red box). The 'Resource path' is displayed as '/api/x_snc_polls/v1/poll/{poll_id}'.

Click **Submit**.

Test with REST API Explorer

Open 'Edit poll' resource and Click **Explore REST API** in related actions.

18. **Edit poll** resource is preselected in API Explorer.



a. Fill in request body in raw tab under Request body section.

A sample request payload can be found at:

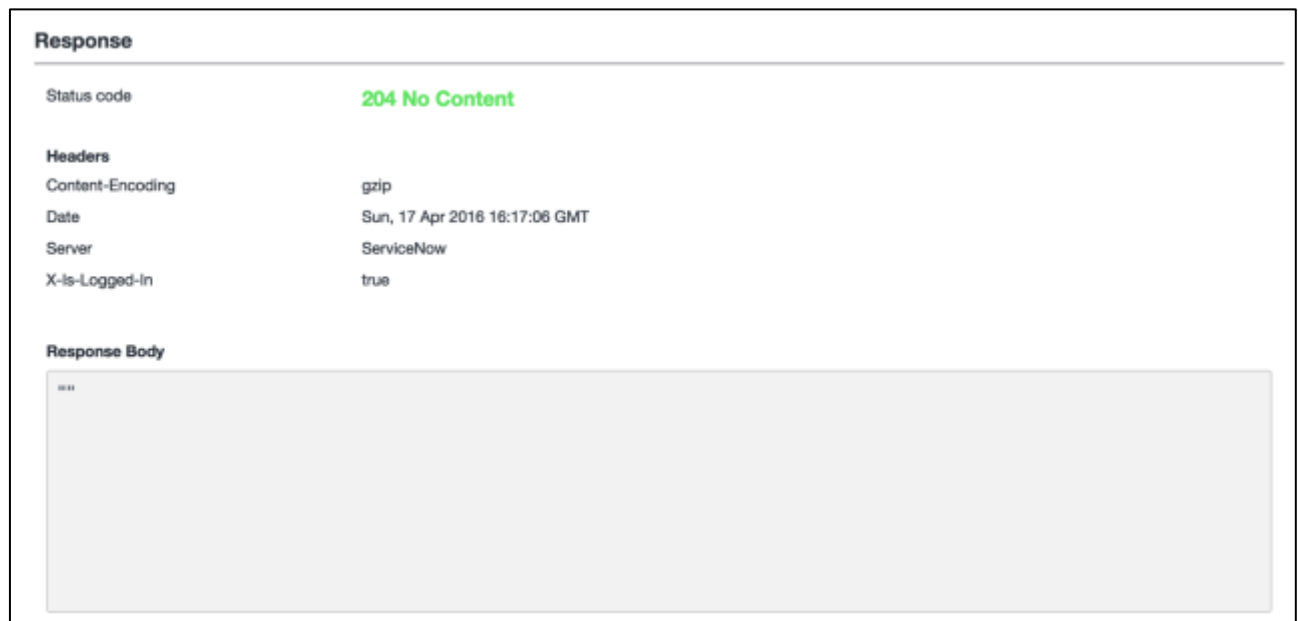
http://bit.ly/CC17_ScriptedRESTAPI_Lab3_edit_poll_sample_request

b. Copy the sample payload into the 'Raw' tab.



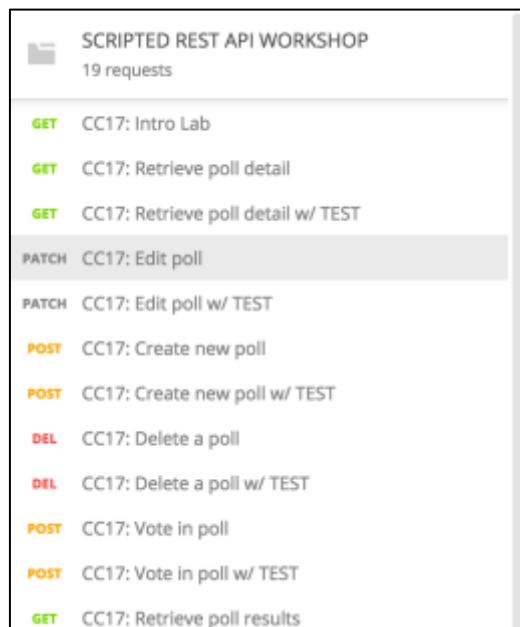
Click **Send**.

19. Verify response status code is **204-No content**.



Create tests in Postman

20. In Postman select the 'CC17:Edit poll' request. This is a pre-built request that already contains an appropriately formatted payload for calling the 'Edit poll' resource.



21. Update the request replacing the `{{instance_url}}`, authorization credentials, and `{{poll_id}}` with values appropriate for your lab instance. Use your admin credentials for this request. Once you've updated those values save and then send the request.

As you saw when you tested with the REST API Explorer a successful response will include a **204** status code and an empty payload. Let's add tests in Postman that verify that the following details in the response:

- Response status code is 204
- Response payload is empty

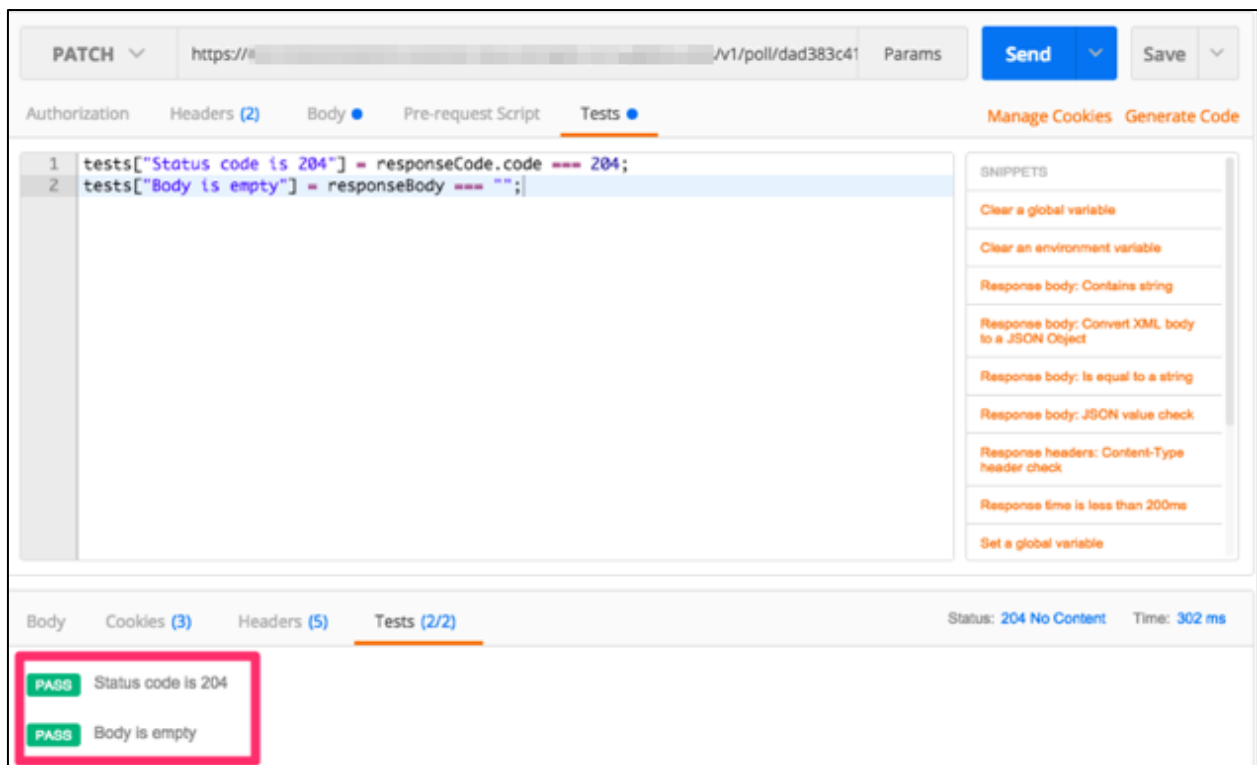
22. Update the request in Postman to include the following:

```
tests["Status code is 204"] = responseCode.code === 204;  
tests["Body is empty"] = responseBody === "";
```

For ease you can also copy these from:

http://bit.ly/CC17_ScriptedRESTAPI_Lab3_edit_poll_test_script

23. After adding the tests above save your request in Postman and Send the request. In the response you should see the following tests and results.



Create New Resource in Polls API – Vote in poll

24. The 'Vote in poll' resource will be used to cast a vote for an answer to a specific question or set of questions that are part of a poll in the 'Polls' application. Open Polls API in studio and add a **Resource** to the API. Click **New** on the **Resources** related list.

API definition Poll ⓘ

Application Polls ⓘ

Name Vote in poll

API version v1 ⓘ

Active ☒

Request routing

The route configuration specifies the 'HTTP method' and 'Relative path'. These fields determine how HTTP clients access this resource.

The relative path identifies the sub-path to this resource relative to the base API path. The relative URI can contain path parameters such as '/abc/{id}'. The requesting client specifies the id value, available to the script at runtime via the: [Request API](#).

[More info](#)

HTTP method POST

Relative path /{poll_id}/vote

Resource path /api/x_snc_polls/v1/poll/{poll_id}/vote

Implement the resource

Access request details including URI path parameters, query parameters, headers, and the request body using the: [Request API](#).

Configure the response including setting the HTTP status code, response body, and any response headers using the: [Response API](#).

[More info](#)

Script

```
1 * (function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {
2
3     var pollId = request.pathParams.poll_id;
4     var pollHelper = new x_snc_polls.PollData_Creator();
5
6     // Validate if poll record exists
7     var pollRecord = new GlideRecord("x_snc_polls_poll");
```

Specify the following properties for the new resource.

Name: **Vote in poll**

API Version: **v1**

HTTP method: **POST**

Relative path: **/[{poll_id}]/vote**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab3_vote_in_poll

API definition: Poll ⓘ

Name: **Vote in poll**

Application: Polls ⓘ

API version: **v1** ⓘ

Active: ☒

Request routing

The route configuration specifies the 'HTTP method' and 'Relative path'. These fields determine how HTTP clients access this resource.

The relative path identifies the sub-path to this resource relative to the base API path. The relative URI can contain path parameters such as '/abc/{id}'. The requesting client specifies the id value, available to the script at runtime via the: [Request API](#).

[More info](#)

HTTP method: **POST**

Relative path: **/[poll_id]/vote**

Resource path: /api/x_snc_polls/v1/poll/{poll_id}/vote

Implement the resource

Access request details including URI path parameters, query parameters, headers, and the request body using the: [Request API](#).

Configure the response including setting the HTTP status code, response body, and any response headers using the: [Response API](#).

[More info](#)

Script

```

1 (function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {
2
3     var pollId = request.pathParams.poll_id;
4     var pollHelper = new x_snc_polls.PollData_Creator();
5
6     // Validate if poll record exists
7     var pollRecord = new GlideRecord("x_snc_polls_poll");

```

NOTE: Observe the custom response string being written to the response using the 'getStreamWriter' method. The getStreamWriter method is used to produce a custom response in Scripted REST APIs and allows you (the API creator) to precisely specify the format of the response. It is important to set content type and status code if writing to stream directly.

Script

```

1 (function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {
2
3     var pollId = request.pathParams.poll_id;
4     var pollHelper = new x_snc_polls.PollData_Creator();
5
6     // Validate if poll record exists
7     var pollRecord = new GlideRecord("x_snc_polls_poll");
8     pollRecord.get(pollId);
9
10    var voteData = request.body.data.votes;
11
12    // Record votes
13    pollHelper.voteInPoll(voteData, pollId);
14
15    // Set response details
16    response.setStatus(201);
17    response.setContentType("application/json");
18    var responseBody = '{"message":"Voting successful"}';
19    response.getStreamWriter().writeString(responseBody);
20
21 })(request, response);

```

Protection policy: -- None --

Click **Submit**.

Test with REST API Explorer

25. Open 'Vote in poll' resource and Click **Explore REST API** in related actions.
26. **Vote in poll** resource is preselected in API Explorer. Fill in request body in raw tab under Request body section.

The screenshot shows the REST API Explorer interface. On the left, the 'Namespace' is 'x_snc_polls', 'API Name' is 'Poll', and 'API Version' is 'v1'. Below these, there are links for 'Create new poll (POST)', 'Retrieve poll details (GET)', 'Edit poll (PATCH)', and 'Vote in poll (POST)'. The 'Vote in poll (POST)' link is highlighted with a red box. On the right, the 'Poll' resource is selected, and the 'Vote in poll - Answer poll' action is shown. The request URL is 'POST http://10.11.91.87:16001/api/x_snc_polls/v1/poll/{poll_id}/vote'. Below the URL, the 'Prepare request' section shows 'Path parameters' with a table:

Name	Value
* poll_id	ddee64b9443a1200964fac543127a1ab

The table is highlighted with a red box. Below the path parameters, there is a 'Query parameters' section with an 'Add query parameter' button.

A sample request payload can be found at:

http://bit.ly/CC17_ScriptedRESTAPI_Lab3_vote_in_poll_sample_request

NOTE: you will need to update the 'poll_id' to be that of a specific poll that exists in the Polls application on your lab instance.

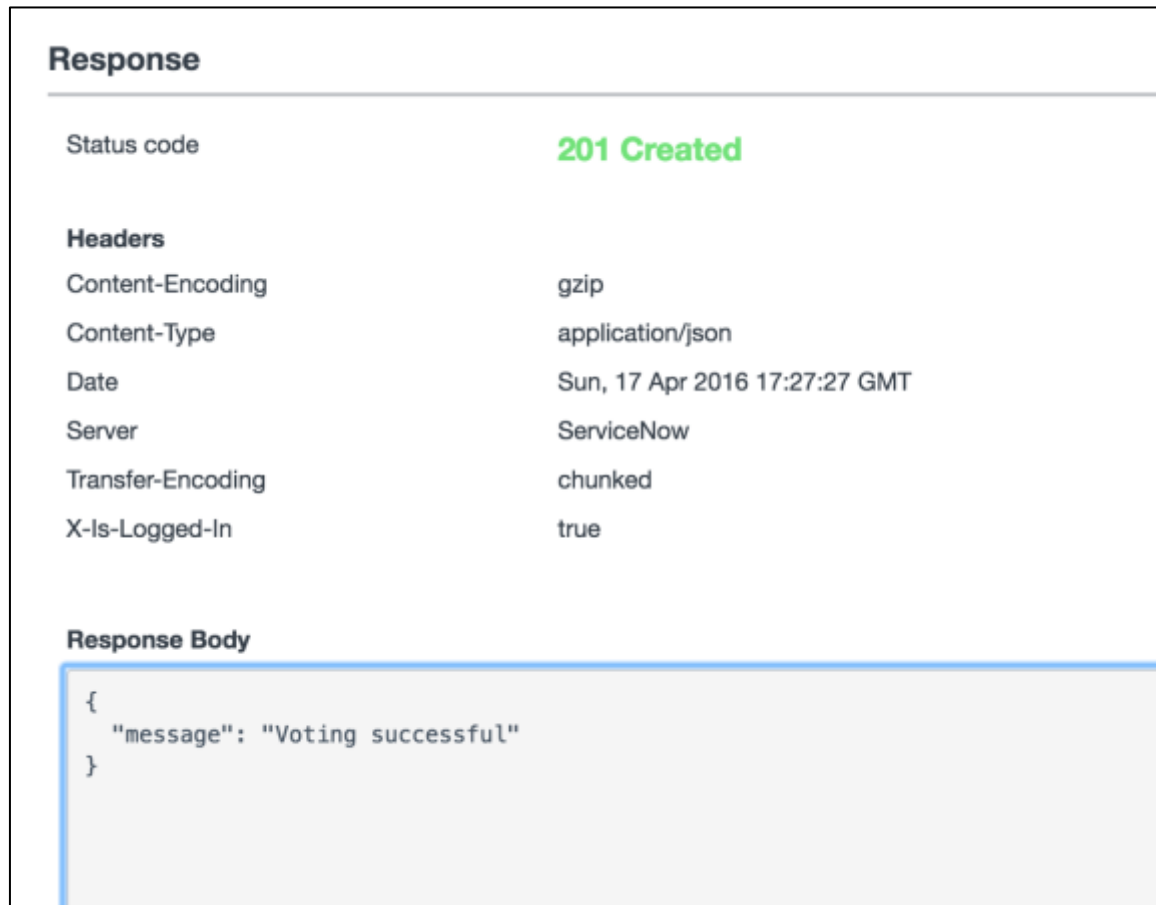
The screenshot shows the 'Request Body' section of the REST API Explorer. The 'Raw' tab is selected, and the request body is a JSON payload:

```
{  "votes": [{    "question_id": "d5f383c4137612006ae13d62f244b056",    "vote": "Yellow"  }]}
```

 The JSON payload is highlighted with a red box. At the bottom left, there is a 'Send' button. At the bottom right, there are links for different languages: [ServiceNow Script], [cURL], [Python], [Ruby], and [JavaScript].

Click **Send**.

27. Verify response status code is **201 Created**.



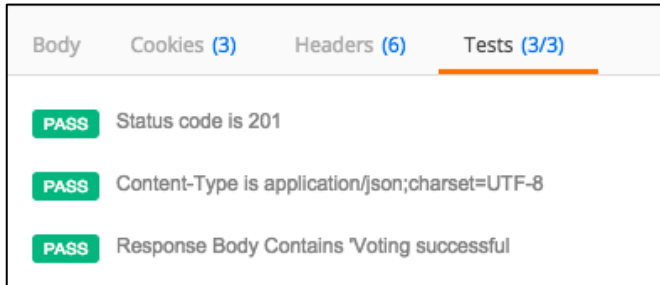
The screenshot displays a REST client interface showing a successful response. The status code is 201 Created. The response headers include Content-Encoding: gzip, Content-Type: application/json, Date: Sun, 17 Apr 2016 17:27:27 GMT, Server: ServiceNow, Transfer-Encoding: chunked, and X-Is-Logged-In: true. The response body is a JSON object with a message: "Voting successful".

Response	
Status code	201 Created
Headers	
Content-Encoding	gzip
Content-Type	application/json
Date	Sun, 17 Apr 2016 17:27:27 GMT
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true
Response Body	
<pre>{ "message": "Voting successful" }</pre>	

Create tests in Postman

27. In Postman select the 'CC17:Vote in poll' request. This is a pre-built request that already contains an appropriately formatted payload for calling the 'Vote in poll' resource.
28. Update the request replacing the `{{instance_url}}`, authorization credentials, and `{{poll_id}}` with values appropriate for your lab instance. Use your admin credentials for this request. Once you've updated those values save and then send the request.
29. As you saw when you tested with the REST API Explorer a successful response will include a **201** status code and an JSON payload informing you that voting was successful. Add tests in Postman that verify that the following details in the response:
 - Response status code is 201
 - Response headers include Content-Type of application/json;charset=UTF-8
 - Response body contains the text: "Voting successful"

30. You are on your own to create these tests in Postman. You can refer back to the tests you've created in the previous steps for help.
31. Once you've added the tests save the request and send it. If you were successful you should see all the tests passing.



Note: If you are really stuck here you can refer to the pre-built request in the Postman collection named "CC17: Vote in poll w/ TEST" to see this request with tests fully specified.

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

32. Similar to creating the Lab3 starting branch, the completed lab can also be checked out from a tag (**Lab3-complete**) in Source control.
33. In **Studio**, navigate to **Source Control > Create Branch**.
34. In the pop-up window, enter a branch name, then select **Lab3-complete** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab3-branch-complete**

Create from Tag: **Lab3-complete**

35. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
36. Verify Studio is on branch **my-Lab3-branch-complete**.

Lab 3 is complete. You are now ready to begin lab 4.

Lab Goal

In Lab 4 you'll continue building out the REST API for the **Polls** application adding resources to support retrieving the results of a poll which includes details of individuals votes as well as the ability to delete a poll. These operations expose functionality that should be restricted to users with an additional role so that we can limit access to see how individual users voted as well as be able to delete polls.

Scripted REST APIs allow you to specify ACLs that requestors must have to be able to make a request both at the API and Resource level. These ACLs can then be associated users or groups via the standard access control mechanism in ServiceNow.

Scripted REST APIs allow you to configure, at both the API and Resource level, if a requestor needs to **authenticate** (via Basic Auth or OAuth2.0) to ServiceNow to make requests. In addition, you can configure if the requestor must be authorized, via specific ACLs, to make a request to your API.

In building out these additional resources you will familiarize yourself with how you can use the security features of Scripted REST APIs to secure your REST API.

Lab 4 Enforcing Security

Create Lab 4 starting branch

1. In **Studio**, navigate to **Source Control > Create Branch**.
2. In the pop-up window, enter a branch name, then select **Lab4-start** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab4-branch**

Create from Tag: **Lab4-start**

3. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
4. Verify Studio is on branch **my-Lab4-branch**.
5. You are now ready to start **Lab 4**.

Create New Resource in Polls API – Retrieve poll results

6. Open Polls API from studio. Add a **Resource** to the API. Click **New** on the **Resources** related list.

Give the resource a **Name**. Complete the script.

Name: **Retrieve poll results**

API Version: **v1**

HTTP method: **GET**

Relative path: **/[poll_id]/results**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab4_retrieve_poll_results

NOTE: Notice that the script is using the GlideRecordSecure API.

The screenshot shows the 'Scripted REST Resource' configuration page in ServiceNow. The title bar indicates the resource is named 'Retrieve poll results'. The configuration is as follows:

- API definition:** Poll
- Name:** Retrieve poll results (highlighted with a red box)
- Application:** Polls
- API version:** v1 (highlighted with a red box)
- Active:** ☒

Request routing

The route configuration specifies the 'HTTP method' and 'Relative path'. These fields determine how HTTP clients access this resource. The relative path identifies the sub-path to this resource relative to the base API path. The relative URI can contain path parameters such as '/abc/[id]'. The requesting client specifies the id value, available to the script at runtime via the: [Request API](#).

More info

HTTP method: GET (highlighted with a red box)

Relative path: /[poll_id]/results (highlighted with a red box)

Resource path: /api/x_snc_polls/v1/poll/[poll_id]/results

Implement the resource

Access request details including URI path parameters, query parameters, headers, and the request body using the: [Request API](#). Configure the response including setting the HTTP status code, response body, and any response headers using the: [Response API](#).

More info

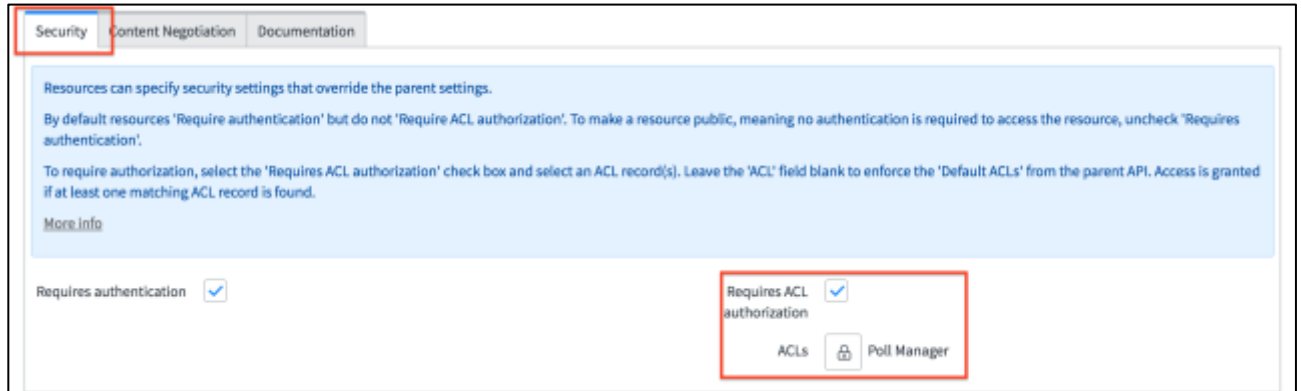
Script

```
1 (function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {  
2   var id = request.pathParams.poll_id;  
3   var pollHelper = new x_snc_polls.PollData_Retriever();  
4   var pollRecord = new GlideRecordSecure("x_snc_polls_poll");  
5   pollRecord.get(id);  
6 }
```

7. Enable ACL authorization on the resource by setting an ACL. ACL settings are available under Security tab

Requires ACL authorization: **checked**

ACLs: Click to unlock, and browse to select the **Poll Manager** ACL



Security Content Negotiation Documentation

Resources can specify security settings that override the parent settings.


By default resources 'Require authentication' but do not 'Require ACL authorization'. To make a resource public, meaning no authentication is required to access the resource, uncheck 'Requires authentication'.

To require authorization, select the 'Requires ACL authorization' check box and select an ACL record(s). Leave the 'ACL' field blank to enforce the 'Default ACLs' from the parent API. Access is granted if at least one matching ACL record is found.

[More info](#)

Requires authentication ☒

Requires ACL authorization ☒

ACLs  Poll Manager

NOTE: Only ACLs of type REST Endpoint can be used.

Click **Submit**.

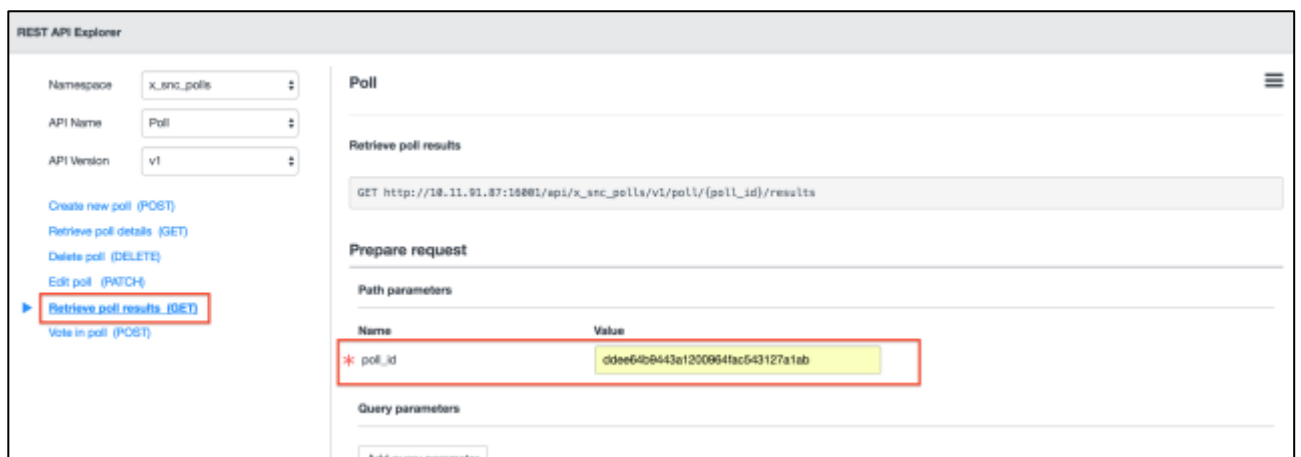
BEST PRACTICES

Do: Use the *GlideRecordSecure* API in your Scripted REST API Resource scripts to ensure that you are enforcing existing access controls on the requesting user when interacting with ServiceNow records.

Do: Test your access controls, both Authentication and Authorization, before making your API available to consumers.

Test with REST API Explorer

8. Open 'Retrieve poll results' resource and Click **Explore REST API** in related actions.
9. **Retrieve poll results** resource is preselected in API Explorer. Fill in sys_id of poll.



REST API Explorer

Namespace: x_snc_polls

API Name: Poll

API Version: v1

Create new poll (POST)

Retrieve poll details (GET)

Delete poll (DELETE)

Edit poll (PATCH)

► Retrieve poll results (GET)

Vote in poll (POST)

Poll

Retrieve poll results

GET http://10.11.91.87:18801/api/x_snc_polls/v1/poll/{poll_id}/results

Prepare request

Path parameters

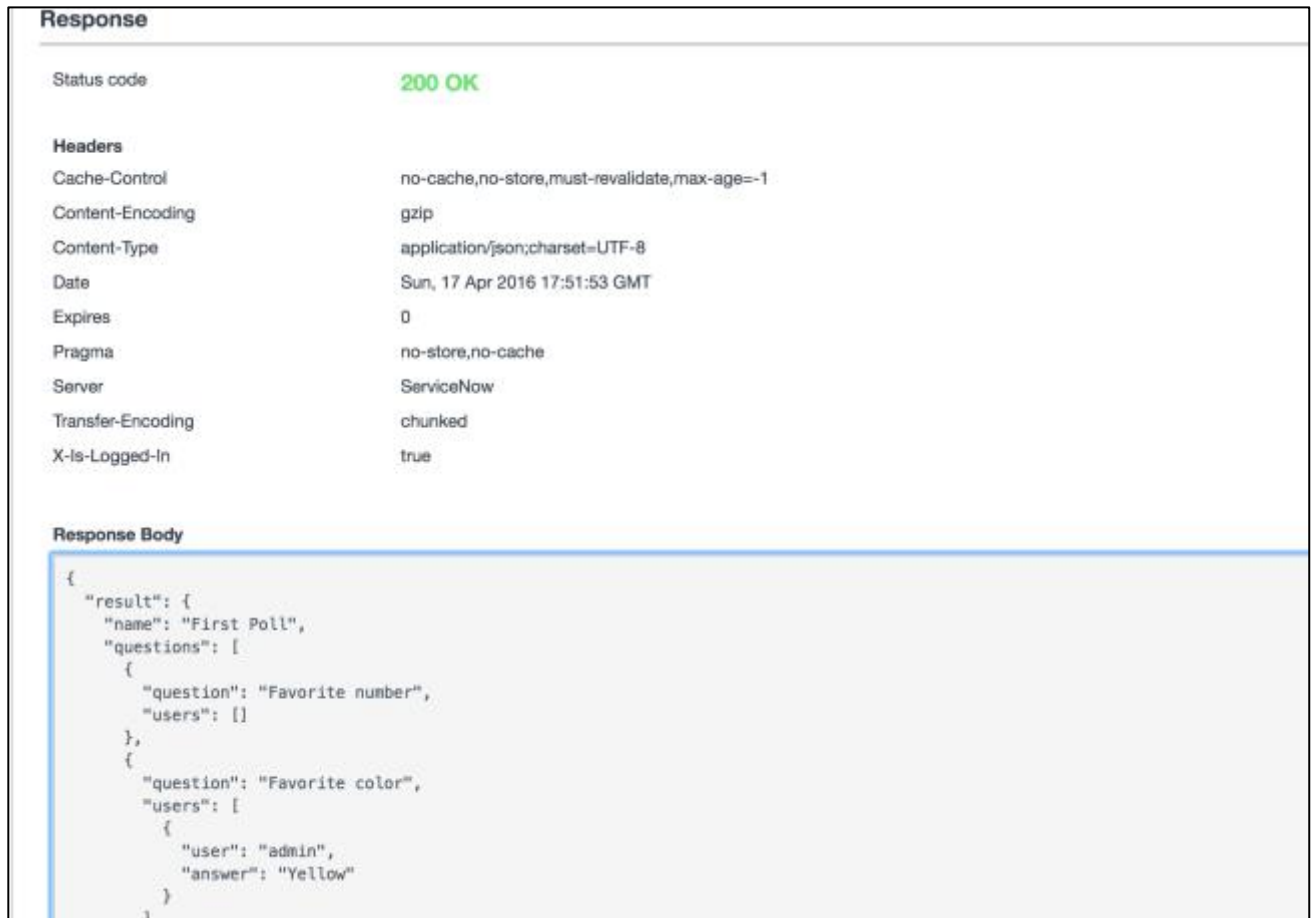
Name	Value
* poll_id	cdee64b8443e1200964fac543127a1ab

Query parameters

Add query parameter

Click **Send**.

10. Verify response status code is **200-Ok**.



The screenshot displays a REST client interface with a 'Response' tab selected. The status code is '200 OK' in green. Below it, a list of headers is shown, including Cache-Control, Content-Encoding, Content-Type, Date, Expires, Pragma, Server, Transfer-Encoding, and X-Is-Logged-In. The response body is a JSON object representing a poll result.

Response

Status code: **200 OK**

Headers

Header	Value
Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 17:51:53 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true

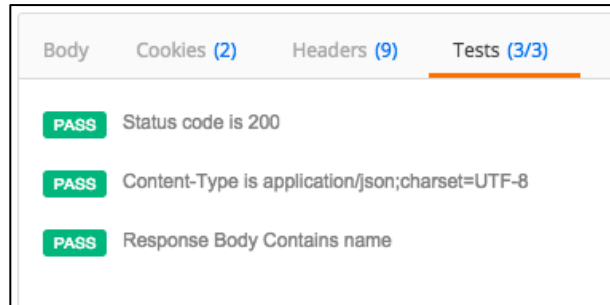
Response Body

```
{
  "result": {
    "name": "First Poll",
    "questions": [
      {
        "question": "Favorite number",
        "users": []
      },
      {
        "question": "Favorite color",
        "users": [
          {
            "user": "admin",
            "answer": "Yellow"
          }
        ]
      }
    ]
  }
}
```

Create tests in Postman

11. In Postman select the 'CC17: Retrieve poll results' request. This is a pre-built request that will make a request to the 'Retrieve poll results' resource.
12. Update the request replacing the {{instance_url}}, authorization credentials, and {{poll_id}} with values appropriate for your lab instance. Use your admin credentials for this request. Once you've updated those values save and then send the request. If the request is successful (200 OK) you will see a response similar to the one you saw when testing in the REST API Explorer.
13. Now that you've made a successful request add tests to your Postman requests to validate the request matches the expected results. Add tests that verify the following details in the response:
 - Response status code is 200
 - Response headers include Content-Type of application/json;charset=UTF-8
 - Response body contains the text: "name"
14. You are on your own to create these tests in Postman. You can refer back to the tests you've created in the previous exercises for help.

15. Once you've added the tests save the request and send it. If you were successful you should see all the tests passing.



Note: If you are really stuck here you can refer to the pre-built request in the Postman collection named “CC17: Retrieve poll results w/ TEST” to see this request with tests fully specified.

Create New Resource in Polls API – Delete poll

16. Open Polls API from studio. Add a **Resource** to the API. Click **New** on the **Resources** related list.

17. Give the resource a **Name**. Complete the script.

Name: **Delete poll**

API Version: **v1**

HTTP method: **DELETE**

Relative path: **/poll_id**

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab4_delete_poll

The screenshot shows the 'Scripted REST Resource' configuration page in ServiceNow. The title bar indicates the resource is 'Delete poll'. The configuration is as follows:

- API definition:** Poll
- Name:** Delete poll
- Application:** Polls
- API version:** v1
- Active:** ☒

Request routing

The route configuration specifies the 'HTTP method' and 'Relative path'. These fields determine how HTTP clients access this resource. The relative path identifies the sub-path to this resource relative to the base API path. The relative URI can contain path parameters such as '/abc/{id}'. The requesting client specifies the id value, available to the script at runtime via the: [Request API](#).

More info

HTTP method: DELETE

Relative path: /poll_id

Resource path: /api/x_snc_polls/v1/poll/{poll_id}

Implement the resource

Access request details including URI path parameters, query parameters, headers, and the request body using the: [Request API](#). Configure the response including setting the HTTP status code, response body, and any response headers using the: [Response API](#).

More info

Script

```
1 {function process( /*RESTAPIRequest*/ request, /*RESTAPIResponse*/ response) {
2   var pollId = request.pathParams.poll_id;
3   var pollRecord = new GlideRecordSecure("x_snc_polls_poll");
4   pollRecord.get(pollId);
5   if (pollRecord.isValidRecord()) {
6     pollRecord.deleteRecord();
7   }
8 }
```

18. Enable ACL authorization on the resource by setting an ACL. ACL settings available under Security tab.

Requires ACL authorization: **checked**

ACLs: Click to unlock, and browse to select the **Poll Manager** ACL

Resources can specify security settings that override the parent settings.

By default resources 'Require authentication' but do not 'Require ACL authorization'. To make a resource public, meaning no authentication is required to access the resource, uncheck 'Requires authentication'.

To require authorization, select the 'Requires ACL authorization' check box and select an ACL record(s). Leave the 'ACL' field blank to enforce the 'Default ACLs' from the parent API. Access is granted if at least one matching ACL record is found.

[More info](#)

Requires authentication ☒

Requires ACL authorization ☒

ACLs Poll Manager

NOTE: Only ACLs of type REST Endpoint can be used

Click **Submit**.

Access Control
Poll Manager

Type: REST_Endpoint

Operation: execute

Admin overrides: ☒

Name: Poll Manager

Description:

Definition

Access Control Rules allow access to the specified resource if all three of these checks evaluate to true:
The user has one of the roles specified in the Role list, or the list is empty.
Conditions in the Condition field evaluate to true, or conditions are empty.
The script in the Script field (advanced) evaluates to true, or sets the variable "answer" to true, or is empty.
The three checks are evaluated independently in the order displayed above.

[More info](#)

Requires role

Role: x_snc_polls.poll_manager

Condition: Not a valid table name (empty)

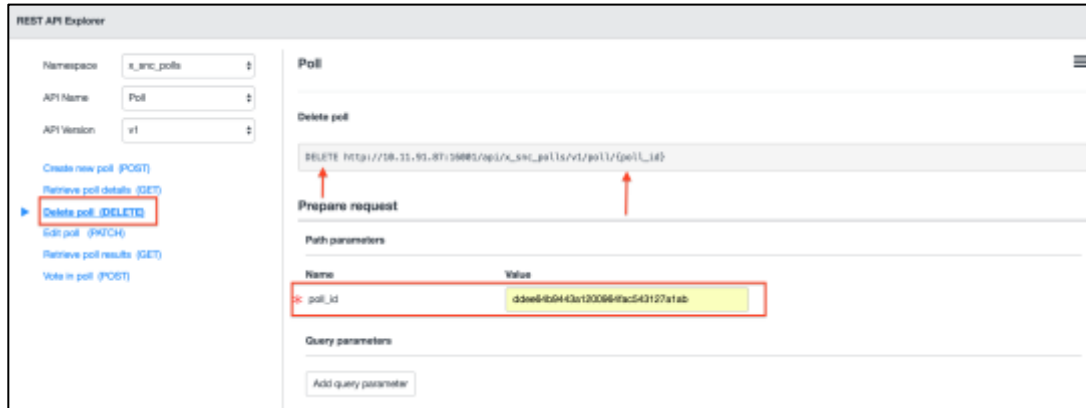
Scripted REST Resources

	Name	HTTP method	Active	Relative path	Resource path	API definition	API version
<input type="checkbox"/>	Delete poll	DELETE	true	/poll_id	/api/x_snc_polls/v1/poll/{poll_id}	Poll	1.0
<input type="checkbox"/>	Retrieve poll results	GET	true	/poll_id/results	/api/x_snc_polls/v1/poll/{poll_id}/results	Poll	1.0

NOTE: REST_Endpoint type ACLs (as shown above) are used to restrict access to Scripted REST API Resources. The 'Poll Manager' ACL has been specified on the 'Delete poll' resource and restricts access to this resource to users who have the role 'x_snc_polls.poll_manager'. **Only** users with this role can make requests to the 'Delete poll' resource.

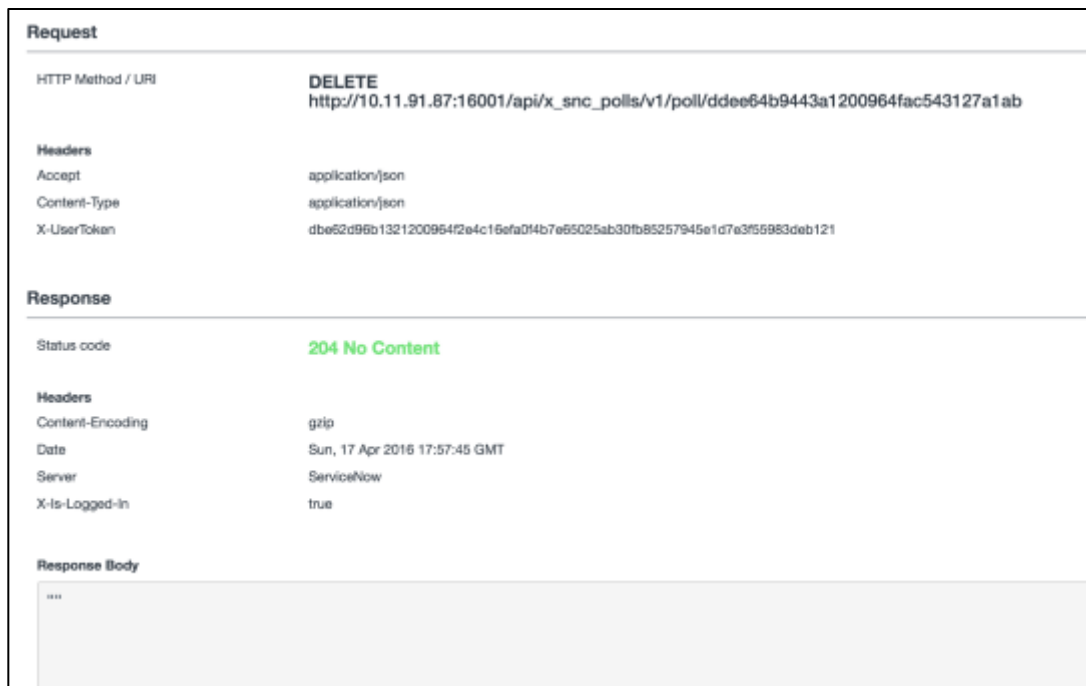
Test with REST API Explorer

19. Open Delete poll resource and click **Explore REST API** in related actions.
20. **Delete poll** resource is preselected in API Explorer. Fill in request body in raw tab under Request body section.



Click **Send**.

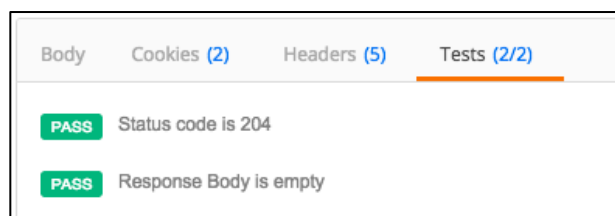
21. Verify response status code is **204-No content**.



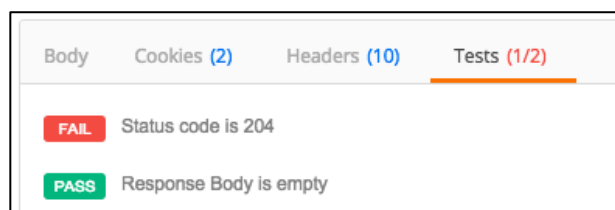
Create tests in Postman

22. In Postman select the 'CC17:Delete poll' request'. This is a pre-built request that will make a request to the 'Delete poll' resource.

23. Update the request replacing the `{{instance_url}}`, authorization credentials, and `{{poll_id}}` with values appropriate for your lab instance. Use your admin credentials for this request. And make sure that the admin user has the 'x_snc_polls.poll_manager' role. Once you've updated those values save and then send the request. If the request is successful (204 No Content) you will see a response similar to the one you saw when testing in the REST API Explorer.
24. Add tests that verify the following details in the response:
- Response status code is 204
 - Response body is empty
25. After adding these tests issue the request and verify that your tests are passing as shown below.



26. Create a new poll in your instance and then update this request in Postman to use the new poll id and update the user credentials to use a user that **does not have** the 'x_snc_polls.poll_manager' role. Update the request in Postman and send the request.
27. **NOTE:** you have been deleting polls so you may need to go back and create some additional poll records in your instance so that there are polls that you can delete (hint use insert and stay to quickly create new polls for testing).
28. Send your updated request now and verify that for a user that when making a request with a user that **does not have** the 'x_snc_polls.poll_manager' role you receive a status code of **403 Forbidden** and that your test fail case 'Status code is 204' **fails** as shown below.



29. **NOTE:** If you are really stuck here you can refer to the pre-built request in the Postman collection named "CC17: Delete a poll w/ TEST" to see this request with tests fully specified.

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

30. Similar to creating the Lab4 starting branch, the completed lab can also be checked out from a tag (**Lab4-complete**) in Source control.
31. In **Studio**, navigate to **Source Control > Create Branch**.
32. In the pop-up window, enter a branch name, then select **Lab4-complete** from the **Create from Tag** menu, and click **Create Branch**.

Branch: **my-Lab4-branch-complete**

Create from Tag: **Lab4-complete**

33. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
34. Verify Studio is on branch **my-Lab4-branch-complete**.
35. Close the REST API Explorer and API Analytics dashboard windows.

Lab 4 is complete. You are now ready to begin lab 5.

Lab Goal

Versioning a REST API is a common task when you want to introduce new functionality or behaviors to your REST API but don't want to break existing clients. Scripted REST APIs support easily versioning your resources. With versioning support you can quickly create new versions of existing resources to introduce new functionality. You have the ability to specify what version of a resource is the default and to which requests will be routed if the client does not specify a version in the URL or to force the clients of your REST API to include a version in the URL they make requests to.

In this lab you will add a new version to the Polls REST API you have been creating to familiarize yourself with the versioning functionality in Scripted REST APIs.

Lab 5 Versioning

BEST PRACTICES

Do: *Version your REST API. By default, you do not need to create a version when creating a Scripted REST API in ServiceNow. Best practice is to version your REST API and disable the default route so that consumers must explicitly include the version number in their request URL. In this way you allow clients to decide if and when they want to use a later version of your REST API. If you need to force them to move to a new version at a later point in time you have the ability to disable versions.*

Create Lab 5 starting branch

1. In Studio, navigate to Source Control > Create Branch.
2. In the pop-up window, enter a branch name, then select **Lab5-start** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab5-branch**

Create from Tag: **Lab5-start**

3. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
4. Verify Studio is on branch **my-Lab5-branch**.
5. You are now ready to start **Lab 5**.

Add Version to Poll REST API

6. Open Poll API and click Add New version.

The screenshot shows the configuration page for a 'Scripted REST Service' named 'Poll'. The page has a header with a menu icon, the title 'Scripted REST Service Poll', and buttons for 'Update' and 'Delete'. The main content area is divided into two columns. The left column contains fields for 'Name' (Poll), 'API ID' (poll), 'Active' (checked), and 'Protection policy' (None). The right column contains fields for 'Application' (Polls), 'API namespace' (x_snc_polls), and 'Base API path' (/api/x_snc_polls/poll). Below these fields are tabs for 'Security', 'Versioning', 'Content Negotiation', and 'Documentation'. The 'Security' tab is active, showing a blue box with text about Default ACLs and a 'More info' link. At the bottom left, there is a 'Related Links' section with links for 'Add new version', 'Explore REST API', and 'API analytics'. At the bottom right, there are 'Update' and 'Delete' buttons.

7. Select version 1 to copy resources. Click Ok.

The screenshot shows a dialog box titled 'Add new version' with a close button (X) in the top right corner. The dialog contains a checkbox labeled 'Make this version the default' which is currently unchecked. Below this, there is a label 'Copy existing resources from version:' followed by a dropdown menu showing 'v1'. At the bottom of the dialog, there are two buttons: 'Cancel' and 'OK'.

Security **Versioning** Content Negotiation Documentation

To add a new version, use the 'Add new version' link below. You can select one version as the default. Clients can access the default version using either the versioned or non-versioned URI path.

Versions may also be inactivated or deprecated:

- Resources belonging to inactive versions cannot serve requests
- Resources belonging to deprecated versions can serve requests, but are identified as 'Deprecated' in documentation

[More info](#)

Default version:

Service Versions

	Version ID	Is default	Active	Deprecated
	v2	false	true	false
	v1	false	true	false
	Insert a new row...			

NOTE: Both versions of the API have default set to **false**. This means that clients consuming this API must include the resource version in the URL.

Resources (12) Request Headers Query Parameters

Resources New Go to

API definition = Poll

	Name	HTTP method	Relative path	Resource path	API version	Active
	Create new poll	POST	/	/api/x_snc_polls/v1/poll	v1	true
	Create new poll (v2)	POST	/	/api/x_snc_polls/v2/poll	v2	true
	Delete poll	DELETE	/[poll_id]	/api/x_snc_polls/v1/poll/[poll_id]	v1	true
	Delete poll (v2)	DELETE	/[poll_id]	/api/x_snc_polls/v2/poll/[poll_id]	v2	true
	Edit poll	PATCH	/[poll_id]	/api/x_snc_polls/v1/poll/[poll_id]	v1	true
	Edit poll (v2)	PATCH	/[poll_id]	/api/x_snc_polls/v2/poll/[poll_id]	v2	true
	Retrieve poll details	GET	/[poll_id]	/api/x_snc_polls/v1/poll/[poll_id]	v1	true

NOTE: Observe every resource in v1 is copied and added to v2

Test with Postman

8. In Postman, review the requests named 'CC17: Create new poll v1' and 'Create new poll v2' noting the version number is explicitly specified in the URL for these two requests.
9. Add the tests that you added to the 'CC17: Create new poll' request to this the V1 and V2 requests. The behavior between the V1 and V2 resources has not been updated so you can copy and paste your test cases from the 'CC17: Create new poll' request and the tests should pass.
10. Verify that your test cases pass successfully.

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

11. Similar to creating the Lab2 starting branch, the completed lab can also be checked out from a tag (**Lab5-complete**) in Source control.
12. In **Studio**, navigate to **Source Control > Create Branch**.
13. In the pop-up window, enter a branch name, then select **Lab5-complete** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab5-branch-complete**

Create from Tag: **Lab5-complete**

14. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
 15. Verify Studio is on branch **my-Lab5-branch-complete**.
 16. Close the REST API Explorer and API Analytics dashboard windows.
- Lab 5 is complete. You are now ready to begin lab 6.**

Lab Goal

Errors... they happen to the best of us. Whether you are making requests to a 3rd party REST API or your own REST API there are times when you receive errors. Ideally the error message provides you (the client) with enough information to realize what went wrong, if it was your fault (client) or their fault (REST API) and how you can proceed.

Scripted REST APIs provide a helper API (sn_ws_err) to make it easier for you as the REST API designer to easily to return consistent and informative error messages from your REST API.

Lab 6 Error handling

Create Lab 6 starting branch

1. In **Studio**, navigate to **Source Control > Create Branch**.
2. In the pop-up window, enter a branch name, then select **Lab6-start** from the **Create from Tag** menu, and click **Create Branch**.

Branch: **my-Lab6-branch**

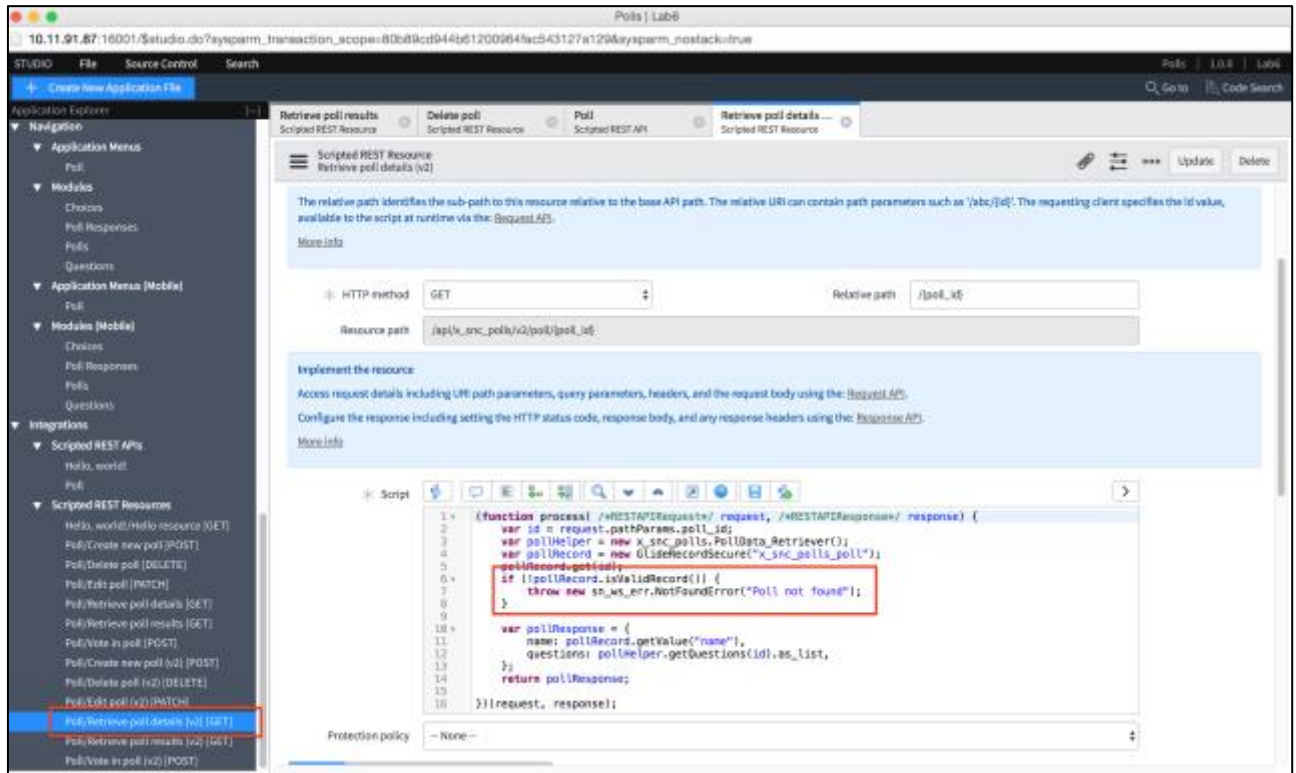
Create from Tag: **Lab6-start**

3. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.
4. Verify Studio is on branch **my-Lab6-branch**.
5. You are now ready to start **Lab 6**.

Add Error handling to API – Retrieve poll detail

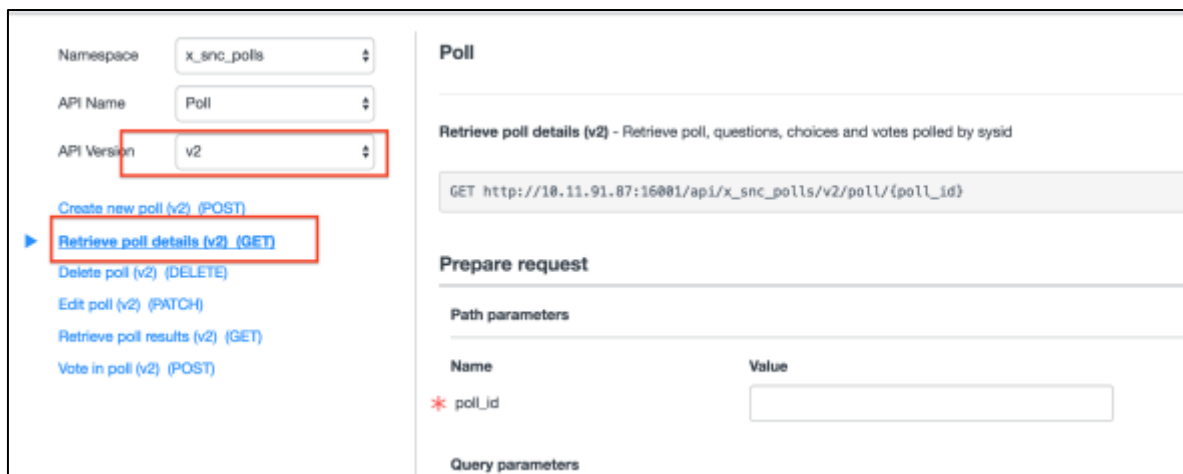
- Open Retrieve poll detail (v2).
- Modify script to check if poll record exists and send a 404 error response.

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab6_retrieve_poll_detail_v2

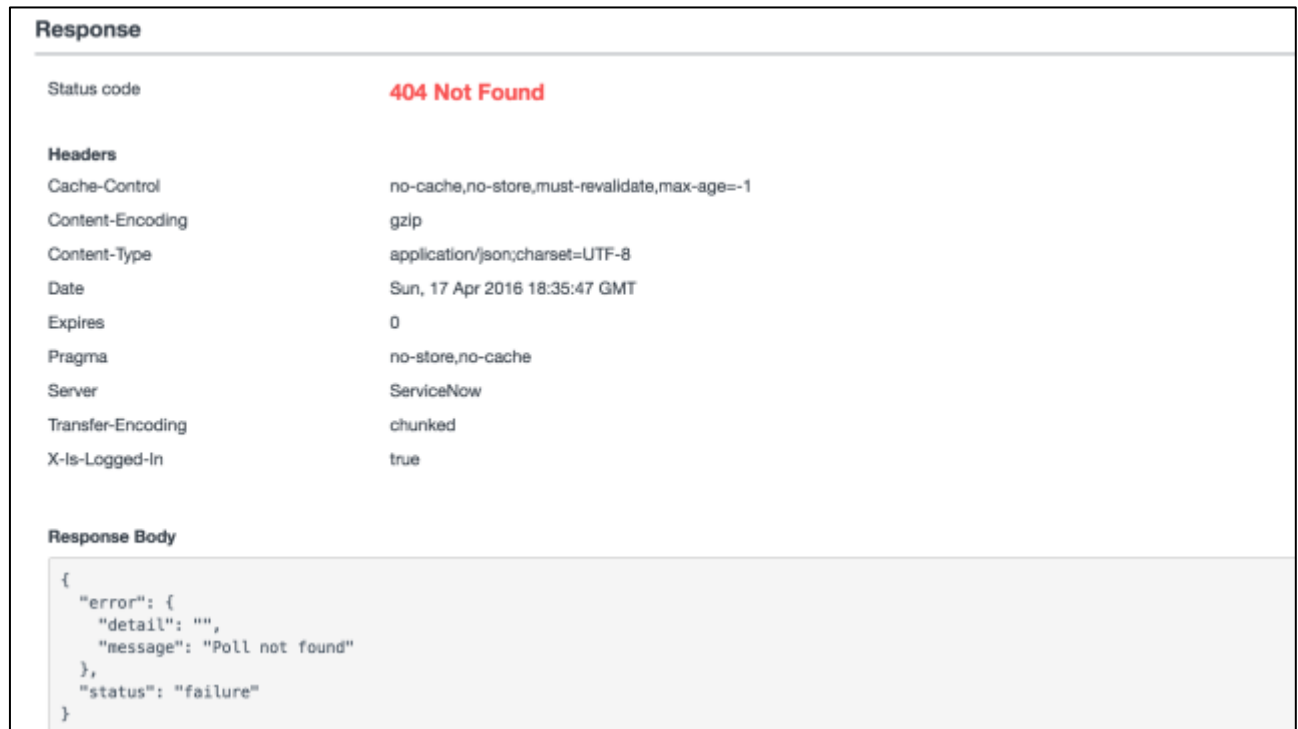


Test with REST API Explorer

- Open 'Retrieve poll detail (v2)' resource and Click **Explore REST API** in related actions.
- Version v2** of **Retrieve poll results** resource is preselected in API Explorer.



10. Fill in **invalid** sys_id of poll and click Send.
11. Verify response status code is **404-Not Found**.



The screenshot shows the 'Response' tab in REST API Explorer. The status code is '404 Not Found' in red. Below it, the 'Headers' section lists various response headers. The 'Response Body' section shows a JSON object indicating a failure to find the poll.

Response	
Status code	404 Not Found
Headers	
Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 18:35:47 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true
Response Body	
<pre>{ "error": { "detail": "", "message": "Poll not found" }, "status": "failure" }</pre>	

Create tests in Postman

12. In Postman select the 'CC17: Retrieve poll detail V2' request'. This is a pre-built request that will make a request to the 'Retrieve poll detail V2' resource.
13. Update the request replacing the {{instance_url}}, authorization credentials, and {{poll_id}} with values appropriate for your lab instance. Be sure to specify an **invalid** poll_id. Send a request and verify that you receive a **404 Not Found** status code and that the response body contains the same error message you received in REST API Explorer.
14. Add tests that verify the following details in the response:
 - Response status code is 404
 - Response body contains "error"
 - Response headers include Content-Type of application/json;charset=UTF-8
 - Response body is JSON and contains a status property with a value of 'failure'.

NOTE: Postman has a test feature that allows you to parse a JSON response and verify it contains a specific property and value. See if you can figure out how to use it. More info can be found at https://www.getpostman.com/docs/testing_examples.

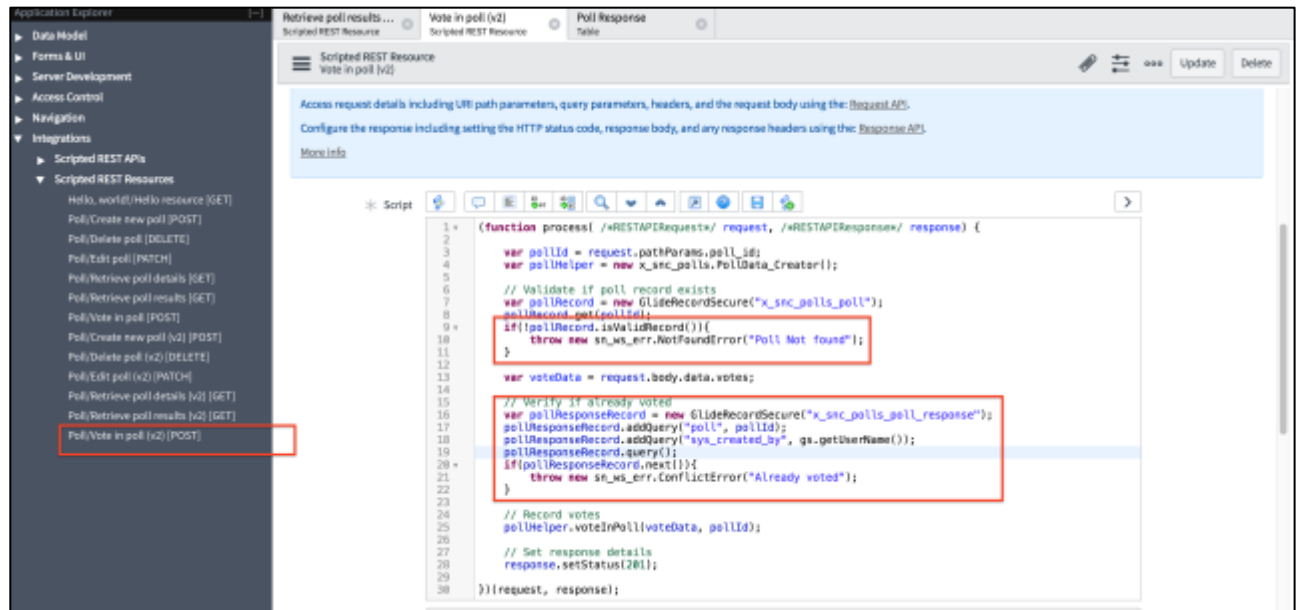
If you are stuck here you can refer to the pre-built request in the Postman collection named "CC17: Retrieve poll detail V2 w/ TEST" to see this request with tests fully specified.

Add Error handling to API – Vote in poll

15. Open Vote in poll(v2).

16. Modify script to check whether poll record exists as well as to see user already voted for the poll.

Script: Copy script from http://bit.ly/CC17_ScriptedRESTAPI_Lab6_vote_in_poll_v2



Test with REST API Explorer

Open 'Vote in poll (v2)' resource and Click **Explore REST API** in related actions.

17. **Version v2** of **Vote in poll** resource is preselected in API Explorer.

18. Fill in an **invalid** sys_id of poll and click Send

19. Verify response status code is **404-Not Found**

Response

Status code	404 Not Found
-------------	----------------------

Headers

Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 18:35:47 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true

Response Body

```
{
  "error": {
    "detail": "",
    "message": "Poll not found"
  },
  "status": "failure"
}
```

20. Now fill in a **valid** sys_id and request body and click Send to vote.

Specify the request body as shown below. Sample script available for you to copy at:
http://bit.ly/CC17_ScriptedRESTAPI_Lab6_vote_in_poll_v2_sample_request

Request Body

Builder **Raw**

```
{
  "votes": [
    {
      "question_id": "ab4fe4b9443a1200984fac543127a1eb",
      "vote": "Yellow"
    }
  ]
}
```

21. Verify response status code is **409-Conflict**.

NOTE: Depending on state of instance, you might need to fire the request twice. The first request is a valid vote while the second request results in a conflict response.

Response

Status code	409 Conflict
-------------	---------------------

Headers

Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 19:12:31 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true

Response Body

```
{
  "error": {
    "detail": "",
    "message": "Already voted"
  },
  "status": "failure"
}
```

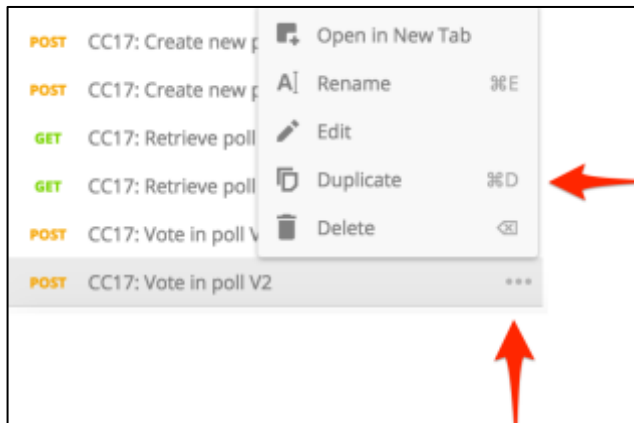
Create tests in Postman

22. In Postman select the 'CC17: Vote in poll V2' request'. This is a pre-built request that will make a request to the 'Vote in poll V2' resource.

23. Update the request replacing the {{instance_url}}, authorization credentials, {{poll_id}}, and body of the request with vote details (question_id and vote value) appropriate for your lab instance.

NOTE: Depending on the state of instance, you might need to fire the request twice. The first request is a valid vote while the second request results in a conflict response. This is because you have added a constraint that users can only vote for a question once.

24. Add tests that verify the following details in the response:
- Response status code is 409 Conflict
 - Response body contains 'error'
 - Response headers include Content-Type of 'application/json;charset=UTF-8'
 - Response body is JSON and contains an error property with message property with a value of 'Already voted'.
25. In Postman create a copy of this request by clicking on the '...' icon to the right of the request name in the left-hand list of requests as shown below and then clicking 'Duplicate'. This will create a copy of your request that you will update to verify the error message that is returned when you attempt to vote on the same question twice.



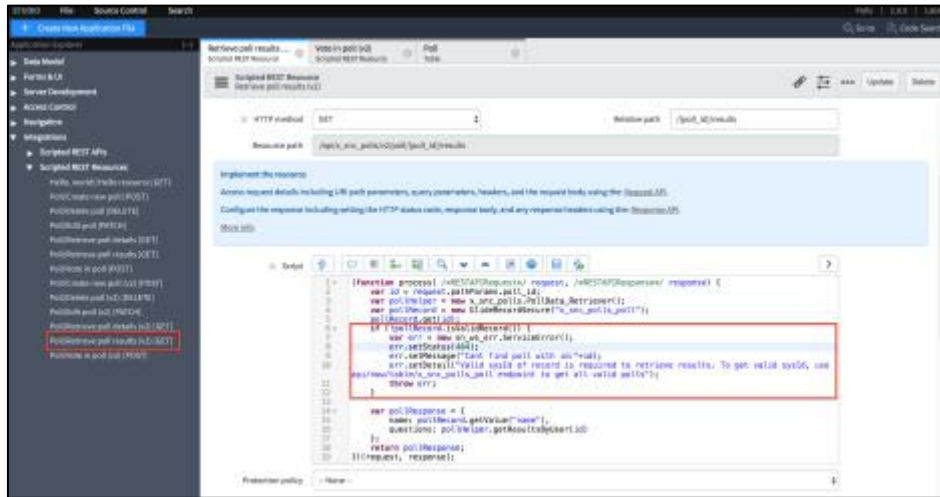
26. Update this new request adding tests that verify the following details in the response:
- Response status code is 409
 - Response body contains "error"
 - Response headers include Content-Type of application/json;charset=UTF-8
 - Response body is JSON and contains a status property with a value of 'failure'.
27. Issue the request and verify that all of your tests have completed successfully.

Add Error handling to API – Retrieve poll results

28. Open Retrieve poll results (v2).

29. Modify script to check if poll exists and send customized error response.

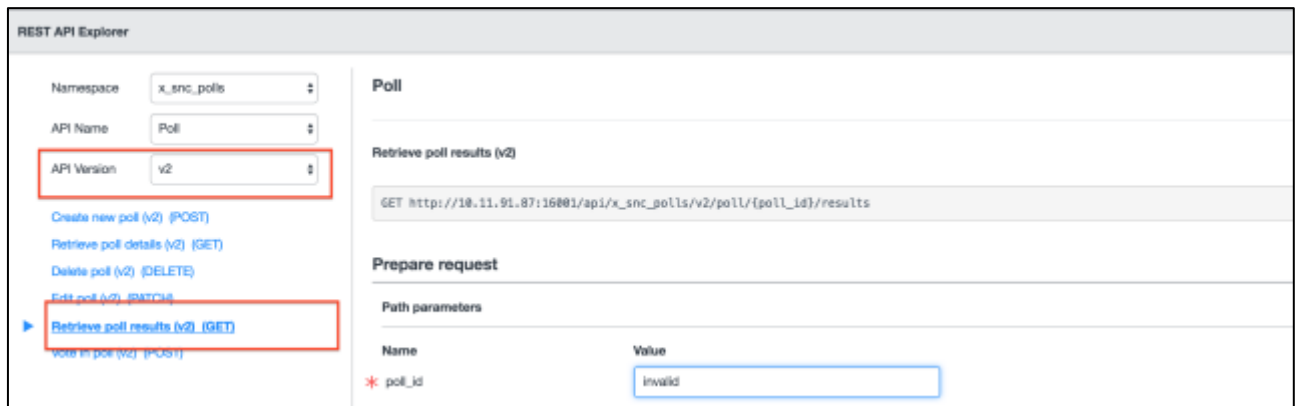
Script: Copy script: http://bit.ly/CC17_ScriptedRESTAPI_Lab6_retrieve_poll_results_v2



Test with REST API Explorer

30. Open 'Retrieve poll results (v2)' resource and Click **Explore REST API** in related actions.

31. **Version v2** of **Retrieve poll results** resource is preselected in API Explorer.



32. Fill in invalid sys_id of poll and click Send.

33. Verify response status code is **404-Not Found** with custom Error message.

Response

Status code	404 Not Found
-------------	----------------------

Headers

Cache-Control	no-cache,no-store,must-revalidate,max-age=-1
Content-Encoding	gzip
Content-Type	application/json;charset=UTF-8
Date	Sun, 17 Apr 2016 19:35:33 GMT
Expires	0
Pragma	no-store,no-cache
Server	ServiceNow
Transfer-Encoding	chunked
X-Is-Logged-In	true

Response Body

```
{
  "error": {
    "detail": "Valid sysId of record is required to retrieve results. To get valid sysId, use api/now/table/x_snc_polls_poll endpoint to get valid sysId.",
    "message": "Can't find poll with id:invalid"
  },
  "status": "failure"
}
```

Create tests in Postman

34. Now that you have experience using Postman to build requests and create tests you are on your own for this last Postman test.
35. Create a new Postman request, either brand new or by duplicating an existing request, that makes a request to the **Retrieve poll results V2 resource** with an **invalid** poll id.
36. Add tests to this request verifying the following:
- Response status code is 404
 - Response body contains "error"
 - Response headers include Content-Type of 'application/json;charset=UTF-8'
 - Response body is JSON and contains an error property with with a message child property that has a value of 'Can't find poll with id:invalid'.
37. Issue request and verify that all tests pass successfully.

Get Caught Up

If you were unable to successfully complete the lab this far, you can “fast forward” using the following steps. Otherwise proceed to the next section **Test with Postman**.

38. Similar to creating the Lab6 starting branch, the completed lab can also be checked out from a tag (**Lab6-complete**) in Source control.

39. In **Studio**, navigate to **Source Control > Create Branch**.

40. In the pop-up window, enter a branch name, then select **Lab6-complete** from the **Create from Tag menu**, and click **Create Branch**.

Branch: **my-Lab6-branch-complete**

Create from Tag: **Lab6-complete**

41. When the switch is complete, click **Close Dialog** in the Create Branch pop-up.

42. Verify Studio is on branch **my-Lab6-branch-complete**.

43. Close the REST API Explorer and API Analytics dashboard windows.

Lab 6 is complete. You are now ready to begin lab 7.

Lab Goal

Congratulations you've made it to the challenge lab. If you've made it this far you have either whizzed right through labs 1-6 and are a Scripted REST API and Postman expert or you're working on this challenge lab after the CreatorCon Workshop.

Throughout this workshop you have built a Scripted REST API for the Polls application and created requests with tests in the Postman collection that allow you to quickly issues requests to your REST API that also have test cases that verify the REST API is returning valid responses and behaving as intended.

Creating tests that validate your REST APIs behavior is a **BEST PRACTICE** that allows you to easily verify your REST API is behaving as intended and quickly identify any breaking changes in your REST API in the future as you make changes to add functionality or patch bugs.

Postman makes it easy to run these tests manually but **Nobody** enjoys running tests manually all the time. Wouldn't it be nice if you could automate these tests? I certainly think so. Let's take this one step further and see if you can get these tests to run from the command line. Postman provides a tool called **Newman** that allows you to run the tests in your existing Postman collection from the command line and see the results either at the command line or write them to a file. For this challenge lab your task is to install Newman and run your Postman collection from the command line. Check out the links below to download and install Newman and get more information on how to run a collection from the command line.

If you can get Newman running from the command line you are only a few steps away (bash, cron, PowerShell script) from automating your REST API test cases with Postman and Newman. This is outside the scope of this lab but you can imagine how you could integrate this with a continuous integration testing tool to have these tests run on a regular basis or as part of a build process.

Newman: <http://blog.getpostman.com/2014/05/12/meet-newman-a-command-line-companion-for-postman/>

Running collections from the command line:
https://www.getpostman.com/docs/newman_intro

Integrating automated API tests with Jenkins:
https://www.getpostman.com/docs/integrating_with_jenkins

Lab 7 Challenge Lab