

Cloud and Serverless Computing Project

Sec-13

ID:2000080043-Akhil

Assigned Project: Serverless Web Application in AWS

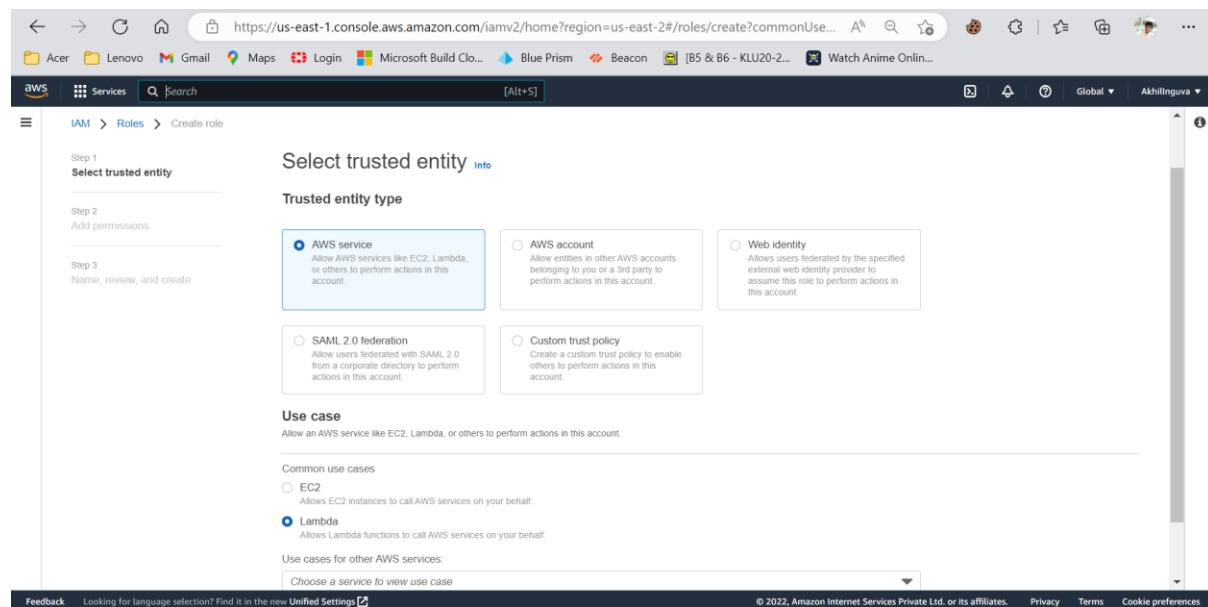
Get and Post employee details : API Gateway

Test REST Api login : Postman api platform(free)

Employee Business Logic : AWS Lambda service

Store employee details : AWS DynamoDB service

Create an IAM Role With Lambda as Use case and Policy:DynamoDB Full access



Add permissions

Permissions policies (Selected 1/785)

Choose one or more policies to attach to your new role.

Policy name	Type	Description
<input checked="" type="checkbox"/>  AmazonDynamoDB ...	AWS managed policy	Provides full access to Amazon DynamoDB via the AWS Management Console.
<input type="checkbox"/>  AWSLambdaDyna...	AWS managed policy	Provides list and read access to DynamoDB streams and write permissions to CloudWatch logs.
<input type="checkbox"/>  AmazonDynamoDB ...	AWS managed policy	Provides read only access to Amazon DynamoDB via the AWS Management Console.
<input type="checkbox"/>  AWSLambdaInvoca...	AWS managed policy	Provides read access to DynamoDB Streams.

Set permissions boundary - optional

Set a permissions boundary to control the maximum permissions this role can have. This is not a common setting, but you can use it to delegate permission management to others.

Name, review, and create

Role details

Role name
Enter a meaningful name to identify this role.
lambda_dynamodb_role_nov24

Description
Add a short explanation for this role.
Allows Lambda functions to call AWS services on your behalf.

Step 1: Select trusted entities

```

1 - [
2 -   "Version": "2012-10-17",
3 -   "Statement": [
4 -     {
5 -       "Effect": "Allow",
6 -       "Action": [
7 -         "sts:AssumeRole"
8 -       ],
9 -       "Principal": [
10 -         "arn:aws:iam::f...

```

Identity and Access Management (IAM)

New! Securely access AWS services from your data center with IAM Roles Anywhere. Learn more

Role lambda_dynamodb_role_nov24 created.

IAM > Roles

Roles (8)

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Role name	Trusted entities	Last acti...
AWSServiceRoleForAmazonElasticFileSystem	AWS Service: elasticfilesystem (Service-Linked Role)	80 days ago
AWSServiceRoleForApplicationAutoScaling_DynamoDBTable	AWS Service: dynamodb.application-autoscaling (Service-Linked Role)	73 days ago
AWSServiceRoleForBackup	AWS Service: backup (Service-Linked Role)	9 hours ago
AWSServiceRoleForSupport	AWS Service: support (Service-Linked Role)	-
AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service-Linked Role)	-
lambda_dynamodb_role_nov24	AWS Service: lambda	-
lambda_dynamodb_sep12	AWS Service: lambda	73 days ago

DYNAMODB:

The screenshot shows the main Amazon DynamoDB landing page. It features a central banner with the text "Amazon DynamoDB" and "A fast and flexible NoSQL database service for any scale". Below the banner, a sub-section titled "How it works" displays a small screenshot of a browser window showing the "What is Amazon DynamoDB?" page. To the right, there's a "Pricing" section with a detailed description of pricing models and a "Get started" button.

This screenshot shows the "Create table" wizard in the AWS DynamoDB console. The first step, "Table details", is completed. The table name is set to "kluniversity". The partition key is defined as "EmpID" of type "Number". A sort key is also defined as "EmpName" of type "String". The wizard indicates that the table is currently "Creating".

This screenshot shows the "Tables" list in the AWS DynamoDB console. A single table named "kluniversity" is listed. The table is in the "Creating" status. The partition key is "EmpID (N)" and the sort key is "EmpName (S)". Provisioned capacity mode is used with auto scaling for both read and write operations at 5 units each. The table size is currently 0 bytes.

Name	Status	Partition key	Sort key	Indexes	Read capacity mode	Write capacity mode	Size
kluniversity	Creating	EmpID (N)	EmpName (S)	0	Provisioned with auto scaling (5)	Provisioned with auto scaling (5)	0 bytes

The kluuniversity table was created successfully.

Name	Status	Partition key	Sort key	Indexes	Read capacity mode	Write capacity mode	Size
kluuniversity	Active	EmpID (N)	EmpName (S)	0	Provisioned with auto scaling (5)	Provisioned with auto scaling (5)	0 bytes

LAMBDA:

Configure blueprint hello-world-python

Basic information

Function name: lambda_nov24

Execution role: Use an existing role (lambda_dynamodb_role_nov24)

Lambda function code

This function contains external libraries.

Successfully created the function lambda_nov24. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

lambda_nov24

Function overview

Code (selected), Test, Monitor, Configuration, Aliases, Versions

Description: A starter AWS Lambda function.

Last modified: 6 seconds ago

Function ARN: arn:aws:lambda:us-east-1:231966875725:function:lambda_nov24

Function URL: [Info](#)

aws Services Search [Alt+S] N. Virginia Akhilnguva

Successfully created the function lambda_nov24. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Code Test Monitor Configuration Aliases Versions

Test event Info

To invoke your function without saving an event, configure the JSON event, then choose Test.

Test event action

Create new event Edit saved event

Event name

demo Maximum of 25 characters consisting of letters, numbers, dots, hyphens and underscores.

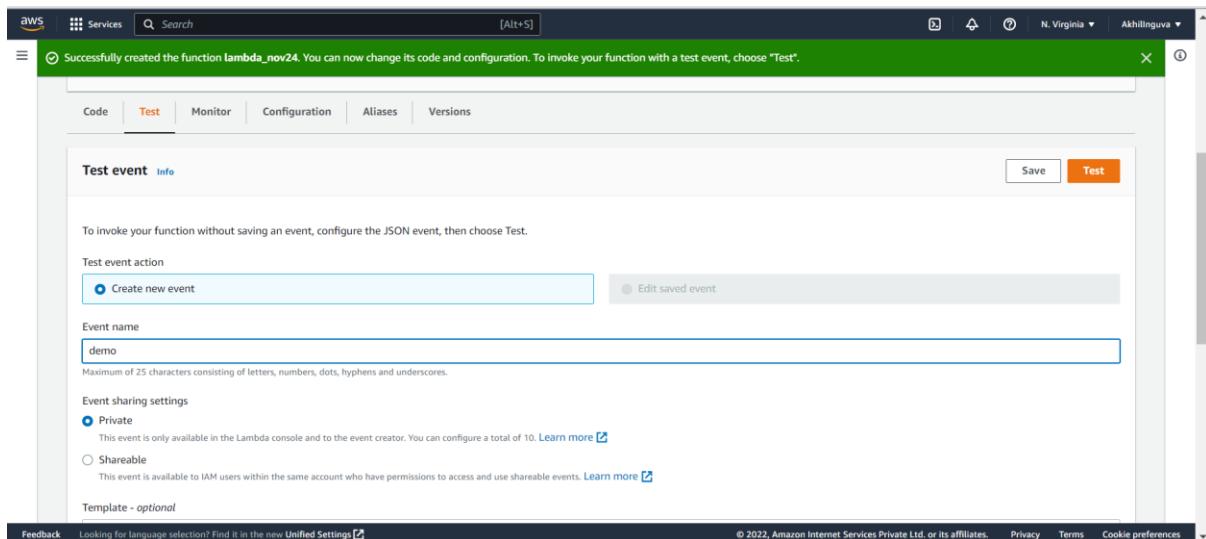
Event sharing settings

Private This event is only available in the Lambda console and to the event creator. You can configure a total of 10. [Learn more](#)

Shareable This event is available to IAM users within the same account who have permissions to access and use shareable events. [Learn more](#)

Template - optional

Feedback Looking for language selection? Find it in the new Unified Settings © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences



aws Services Search [Alt+S] N. Virginia Akhilnguva

Event name

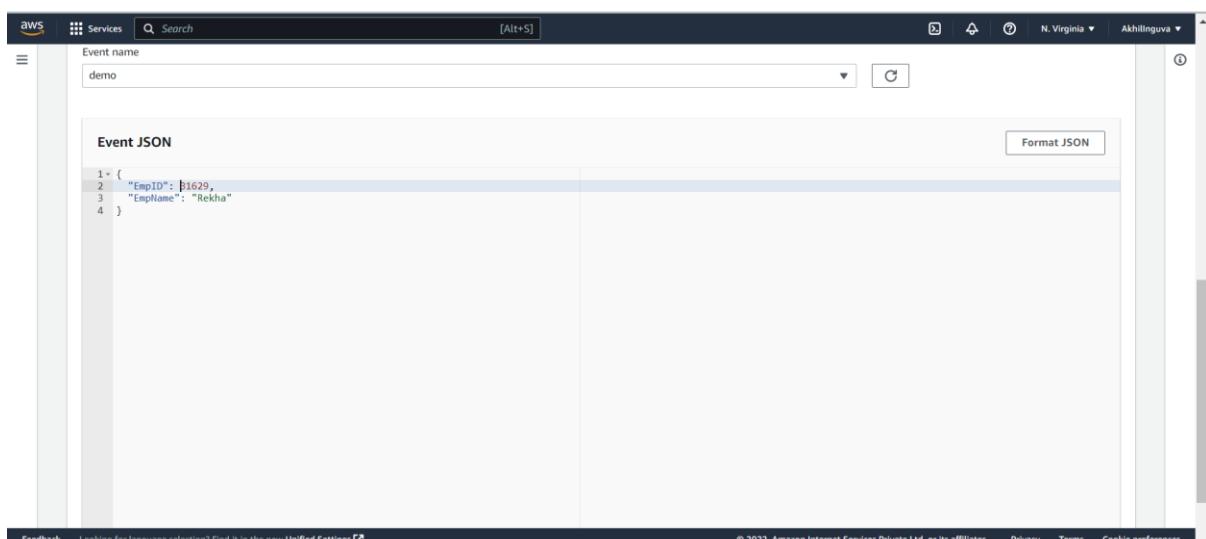
demo

Event JSON

Format JSON

```
1 < {
2   "EmpID": 31629,
3   "EmpName": "Rekha"
4 }
```

Feedback Looking for language selection? Find it in the new Unified Settings © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences



Updating the function lambda_nov24.

Code Test Monitor Configuration Aliases Versions

Code source Info

File Edit Find View Go Tools Window Test Deploy Upload from

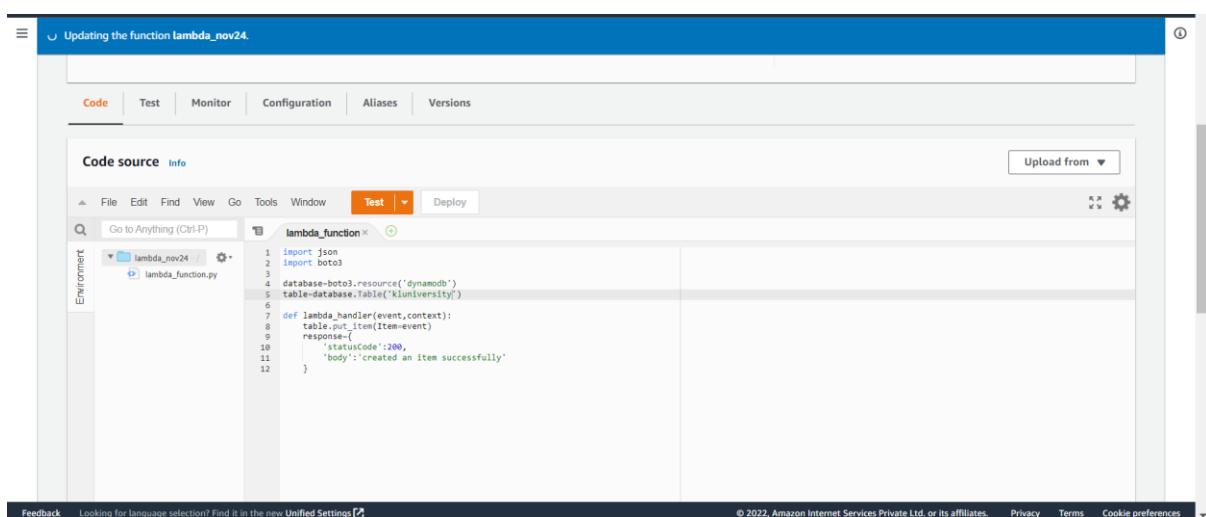
Go to Anything (Ctrl+P)

Environment

lambda_function

```
1 import json
2 import boto3
3
4 database=boto3.resource('dynamodb')
5 table=database.Table("kluniversity")
6
7 def lambda_handler(event,context):
8     table.put_item(Item=event)
9     response={
10         'statusCode':200,
11         'body':'created an item successfully'
12     }
```

Feedback Looking for language selection? Find it in the new Unified Settings © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences



The test event demo was successfully saved.

Code source **Info**

Execution results

Test Event Name demo

Response

```
{
  "statusCode": 200,
  "body": "created an item successfully"
}
```

Function Logs

```
START RequestId: 3df0eacd-a7cd-4d9a-9458-0b80dbb1240a Version: $LATEST
END RequestId: 3df0eacd-a7cd-4d9a-9458-0b80dbb1240a
REPORT RequestId: 3df0eacd-a7cd-4d9a-9458-0b80dbb1240a Duration: 153.43 ms Billed Duration: 154 ms Memory Size: 128 MB Max Memory Used: 73 MB
Request ID
3df0eacd-a7cd-4d9a-9458-0b80dbb1240a
```

DynamoDB

Tables (1)

Any table tag

Find tables by table name

kluniversity

Scan/Query items

Scan/query a table or index

Scan Query kluniversity

Run Reset

Completed Read capacity units consumed: 0.5

Items returned (1)

Actions Create item

EmpID	EmpName
3162	Rekha

REST API:

Screenshot of the AWS API Gateway landing page. It shows three main options: "WebSocket API" (selected), "REST API", and "REST API Private". Each option has a brief description and "Build" and "Import" buttons.

API Gateway

Build a WebSocket API using persistent connections for real-time use cases such as chat applications or dashboards.

REST API

Develop a REST API where you gain complete control over the request and response along with API management capabilities.

REST API Private

Create a REST API that is only accessible from within a VPC.



Screenshot of the "Create new API" wizard. It starts with choosing the protocol (REST selected) and then moves to the "Create new API" step.

Choose the protocol

Select whether you would like to create a REST API or a WebSocket API.

REST WebSocket

Create new API

In Amazon API Gateway, a REST API refers to a collection of resources and methods that can be invoked through HTTPS endpoints.

New API Import from Swagger or Open API 3 Example API

Settings

Choose a friendly name and description for your API.

API name*: RESTAPI_31629

Description

Endpoint Type: Regional

* Required

Create API

Screenshot of the AWS API Gateway "Resources" section for the RESTAPI_31629 API. A context menu is open over a resource path (/).

Actions

- Create Method
- Create Resource
- Enable CORS
- Edit Resource Documentation

No methods defined for the resource.

API: RESTAPI_31629

Resources

- Stages
- Authorizers
- Gateway Responses
- Models
- Resource Policy
- Documentation
- Dashboard
- Settings
- Usage Plans

https://us-east-2.console.aws.amazon.com/apigateway/home?region=us-east-2#

Screenshot of the AWS API Gateway 'New Child Resource' creation page.

The URL is: [https://us-east-2.console.aws.amazon.com/apigateway/home?region=us-east-1#/apis/RESTAPI_31629/resources/ask2lkf2c8/resources>Create](#)

The 'Resource Name' field is set to 'kluniversity'. The 'Resource Path' field is set to '/kluniversity'. The 'Enable API Gateway CORS' checkbox is unchecked.

Actions dropdown menu options shown:

- Create Method
- Create Resource
- Enable CORS
- Edit Resource Documentation
- Delete Resource

API ACTIONS dropdown menu options shown:

- Deploy API
- Import API
- Edit API Documentation
- Delete API

Required field is marked with a red asterisk (*).

Buttons: Cancel, Create Resource.

Screenshot of the AWS API Gateway 'kluniversity Methods' page.

The URL is: [https://us-east-2.console.aws.amazon.com/apigateway/home?region=us-east-1#/apis/RESTAPI_31629/resources/kluniversity/methods](#)

No methods defined for the resource.

Actions dropdown menu options shown:

- Create Method
- Create Resource
- Enable CORS
- Edit Resource Documentation
- Delete Resource

API ACTIONS dropdown menu options shown:

- Deploy API
- Import API
- Edit API Documentation
- Delete API

Screenshot of the AWS API Gateway 'POST - Setup' configuration page.

The URL is: [https://us-east-2.console.aws.amazon.com/apigateway/home?region=us-east-1#/apis/RESTAPI_31629/resources/kluniversity/methods/POST](#)

Choose the integration point for your new method.

Integration type radio buttons:

- Lambda Function (selected)
- HTTP
- Mock
- AWS Service
- VPC Link

Use Lambda Proxy integration checkbox is unchecked.

Lambda Region: us-east-1

Lambda Function: lambda_nov24

Use Default Timeout checkbox is checked.

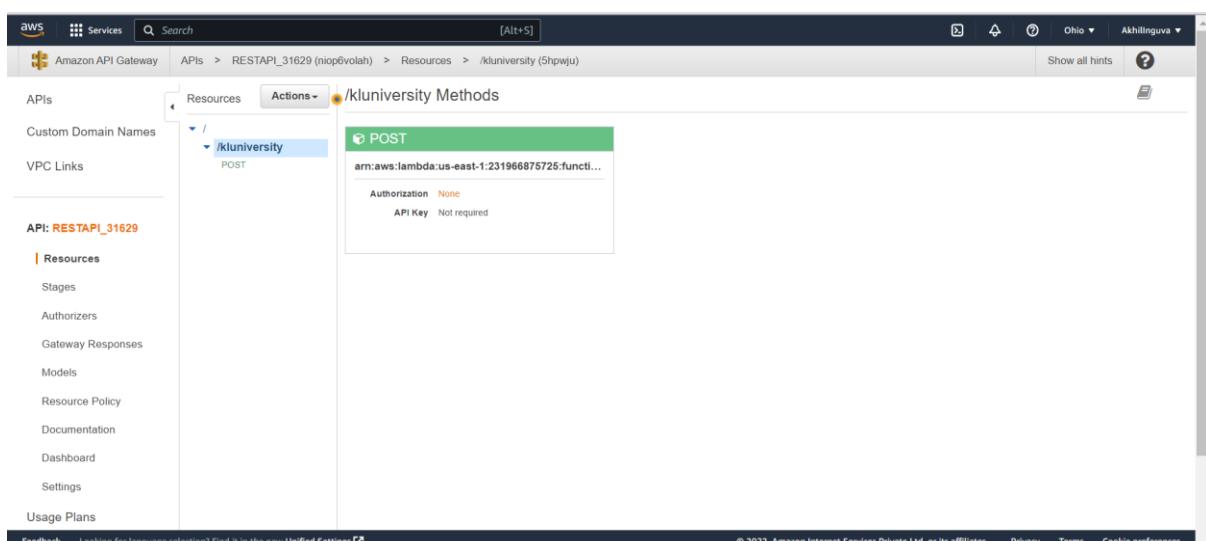
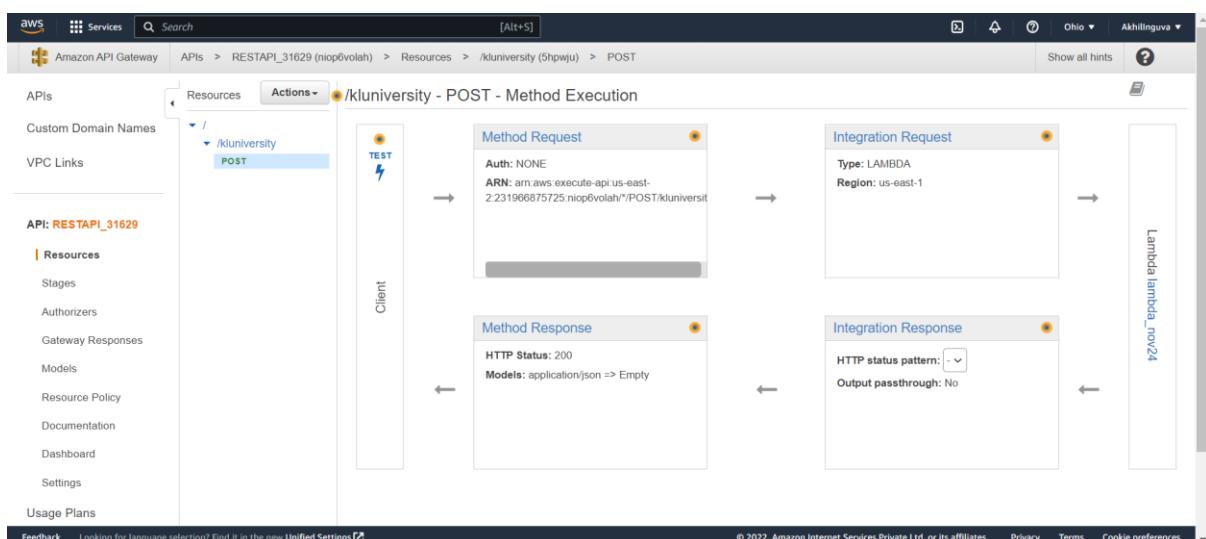
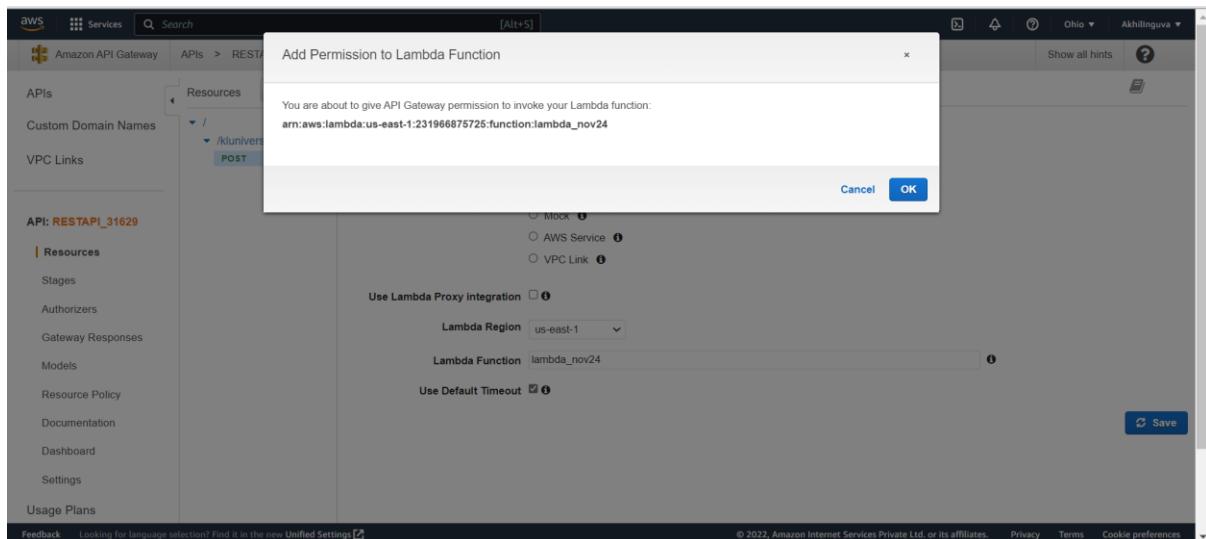
Save button.

Actions dropdown menu options shown:

- Create Method
- Create Resource
- Enable CORS
- Edit Resource Documentation
- Delete Resource

API ACTIONS dropdown menu options shown:

- Deploy API
- Import API
- Edit API Documentation
- Delete API



aws Services Search [Alt+S]

Amazon API Gateway APIs > RESTAPI_31629 (niop6volah) > Resources > /kluniversity > POST

Show all hints ?

Resources Actions - Method Execution /kluniversity - POST - Method Test

Make a test call to your method. When you make a test call, API Gateway skips authorization and directly invokes your method

Path

No path parameters exist for this resource. You can define path parameters by using the syntax **(myPathParam)** in a resource path.

Query Strings

{kluniversity}
param1=value1¶m2=value2

Headers

{kluniversity}
Use a colon (:) to separate header name and value, and new lines to declare multiple headers. e.g.
Accept application/json

Stage Variables

No stage variables exist for this method.

Feedback Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

aws Services Search [Alt+S]

Amazon API Gateway APIs > RESTAPI_31629 (niop6volah) > Resources > /kluniversity > POST

Show all hints ?

Resources Actions - Method Execution /kluniversity - POST - Method Test

Make a test call to your method. When you make a test call, API Gateway skips authorization and directly invokes your method

Path

Request: /kluniversity
Status: 200
Latency: 823 ms
Response Body

{"statusCode": 200, "body": "created an item successfully"}

Response Headers

{"Content-Type":["application/json"],"X-Amzn-Trace-Id":["Root=1-637fa1d3-4b956f661bcdbf441112038;Sampled=0"]}

Logs

Execution log for request 37f61dda-18cd-4fca-a99d-8d36f540982f
Thu Nov 24 16:54:43 UTC 2022 : Starting execution for request: 37f61dda-18cd-4fca-a99d-8d36f540982f
Thu Nov 24 16:54:43 UTC 2022 : HTTP Method: POST, Resource Path: /kluniversity
Thu Nov 24 16:54:43 UTC 2022 : Method request path: {}
Thu Nov 24 16:54:43 UTC 2022 : Method request query string: {}
Thu Nov 24 16:54:43 UTC 2022 : Method request headers: {}

Feedback Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

aws Services Search [Alt+S]

DynamoDB Dashboard Tables Update settings Explore items PartQL editor New Backups Exports to S3 Imports from S3 New Reserved capacity Settings New

Scan/Query items Scan/Query a table or index Scan Query kluniversity

Filters Run Reset

Completed Read capacity units consumed: 0.5

Items returned (2)

EmpID	EmpName	EmpGender
3162	Rekha	
31629	Rekha Sri Durga	Female

Feedback Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

Screenshot 1: API Gateway Methods - POST

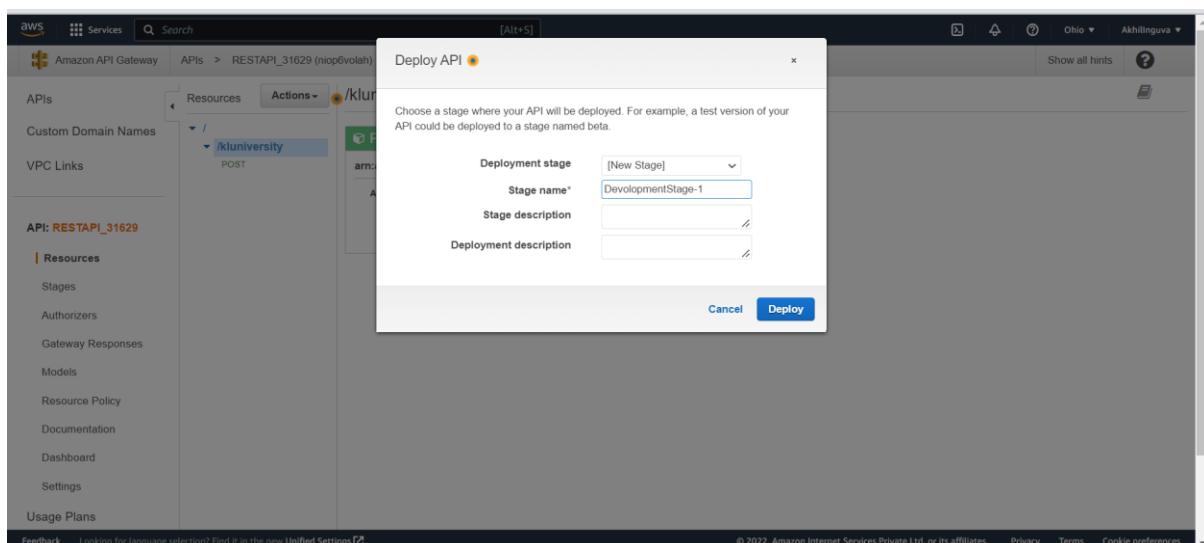
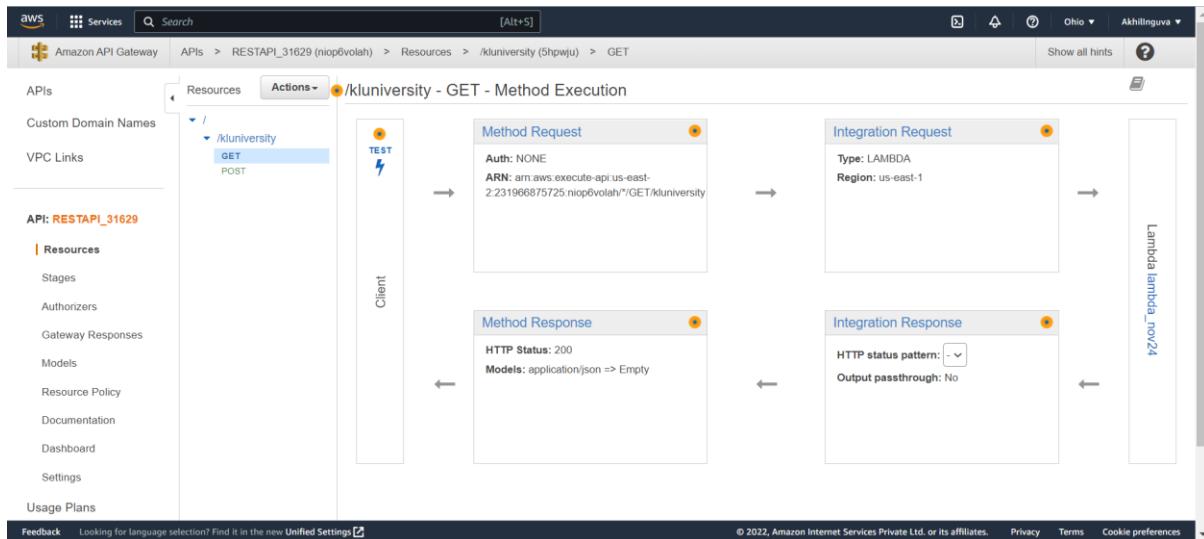
The screenshot shows the AWS API Gateway interface. On the left, the navigation bar includes 'APIs', 'Custom Domain Names', 'VPC Links', and the current 'API: RESTAPI_31629'. Under 'Resources', the path is selected: '/ > /kluniversity'. A dropdown menu for 'Actions' is open, showing options: ANY, DELETE, GET, HEAD, OPTIONS, PATCH, PUT. The 'GET' option is highlighted. The main panel displays the '/kluniversity Methods' section. A 'POST' method is listed, with its ARN: arn:aws:lambda:us-east-1:231966875725:function:lambda_no24. The 'Authorization' field is set to 'None' and 'API Key' is noted as 'Not required'.

Screenshot 2: API Gateway - GET - Setup

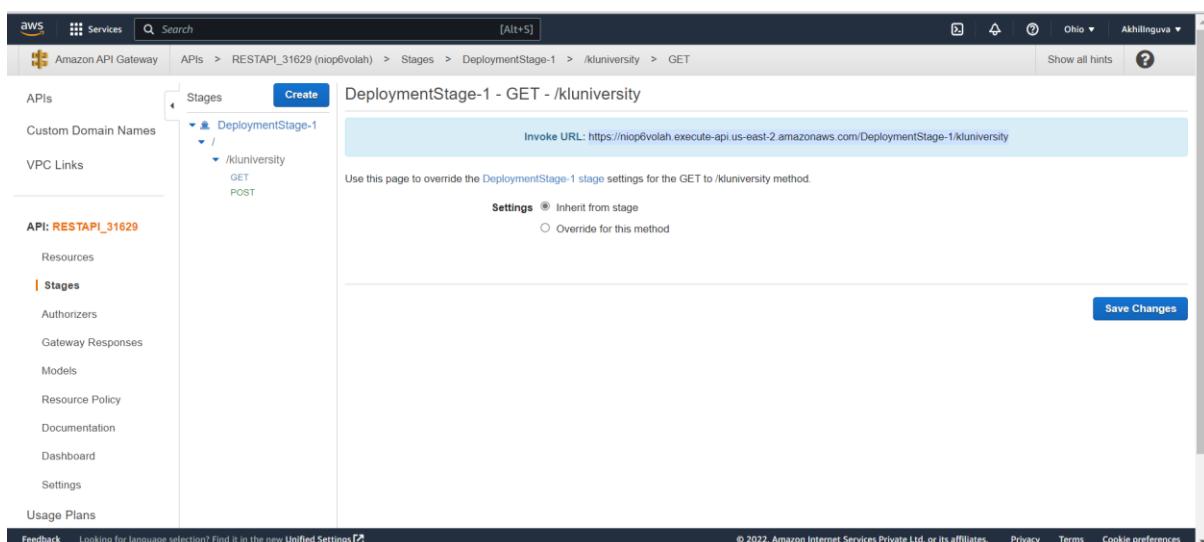
This screenshot shows the configuration for the GET method on the /kluniversity resource. The 'Integration type' is set to 'Lambda Function'. The 'Lambda Region' is 'us-east-1' and the 'Lambda Function' is 'lambda_no24'. The 'Use Default Timeout' checkbox is checked. A 'Save' button is located at the bottom right of the form.

Screenshot 3: Add Permission to Lambda Function

This screenshot shows a modal dialog titled 'Add Permission to Lambda Function'. It contains the text: 'You are about to give API Gateway permission to invoke your Lambda function: arn:aws:lambda:us-east-1:231966875725:function:lambda_no24'. Below this, there are three radio button options: 'Mock', 'AWS Service', and 'VPC Link'. At the bottom right of the dialog, there are 'Cancel' and 'OK' buttons, with 'OK' being highlighted.



In above pic,we have created only one method POST,same as before create a method GET and select that and create the DeploymentStage-1



Copy the Invoke URL and open POSTMAN app

Screenshot of the Postman application interface showing a collection named "ADC_AWSProject33". The left sidebar lists various sections: Collections, APIs, Environments (selected), Mock Servers, Monitors, Flows, and History. The main workspace displays a GET request to "https://niop6volah.execute-api.us-east-2.amazonaws.com/DeploymentStage-1/kluniversity". The "Body" tab is selected, showing a JSON payload:

```
1
2
3
4
```

The response area contains a placeholder message: "Click Send to get a response".

Screenshot of the Postman application interface showing the same collection "ADC_AWSProject33". The "Body" tab is selected, showing a different JSON payload:

```
1
2
3
4
```

The response area contains a placeholder message: "Click Send to get a response".

You don't have any environments.

An environment is a set of variables that allows you to switch the context of your requests.

Create Environment

Body

```
1 "EmpID": 3162,  
2 "EmpName": "Rekha"  
3  
4
```

200 OK 1461 ms 345 B Save Response

Pretty Raw Preview Visualize JSON

You don't have any environments.

An environment is a set of variables that allows you to switch the context of your requests.

Create Environment

Body

```
1 "EmpID": 80043,  
2 "EmpName": "Akhil",  
3 "EmpGender": "Male"  
4  
5
```

200 OK 923 ms 345 B Save Response

Pretty Raw Preview Visualize JSON

DynamoDB

Dashboard

Tables

Update settings

Explore items

PartiQL editor

Backups

Exports to S3

Imports from S3

Reserved capacity

Settings

Clusters

Subnet groups

Parameter groups

Events

Find tables by table name

Scan/Query a table or index

Scan Query kluniversity

Filters

Run Reset

Completed Read capacity units consumed: 0.5

Items returned (3)

EmpID	EmpName	EmpGender
80043	Akhil	Male
3162	Rekha	
31629	Rekha Sri Durga	Female

The Above Image Incidates created an Item Successfully due to the code in the Lambda Function is only creating an item....

For GET method to work ,in lambda function table.get_item(Key=event) is used in the code

The screenshots show the AWS Lambda console interface across three different stages of function configuration.

Screenshot 1: Test Event Configuration

This screenshot shows the "Test event" configuration page. A success message at the top states: "The test event demo was successfully saved." The "Event JSON" section contains the following code:

```
1 - [ { 2 "EmpID": 3162, 3 "EmpName": "Rekha" 4 } ]
```

Screenshot 2: Function Update Progress

This screenshot shows the "Code source" tab with a progress bar indicating "Updating the function lambda_no24." The status bar at the bottom says "Successfully updated the function lambda_no24."

Screenshot 3: Updated Function Configuration

This screenshot shows the "Code source" tab after the update. The function has been successfully updated, and the status bar at the bottom says "Successfully updated the function lambda_no24."

Code Source (Visible in All Screenshots)

```
1 import json 2 import boto3 3 4 database=boto3.resource('dynamodb') 5 table=database.Table('kluniversity') 6 7 def lambda_handler(event,context): 8     response=table.get_item(Key=event) 9     return response
```

```

{
    "Item": {
        "EmpName": "Rekha",
        "EmpID": 3162
    },
    "ResponseMetadata": {
        "RequestId": "0AEKX6ILTS94HQKSDU999HISBVV4KQH505AEHVJF66Q9ASUAJG",
        "HTTPStatusCode": 200,
        "HTTPHeaders": {
            "Content-Type": "application/x-amz-json-1.0",
            "Content-Length": "100",
            "Connection": "keep-alive",
            "x-amzn-requestid": "0AEKX6ILTS94HQKSDU999HISBVV4KQH505AEHVJF66Q9ASUAJG",
            "x-amz-crc32": "708334321"
        },
        "RetryAttempts": 0
    }
}

```

Function Logs
START RequestId: dc384464-3c67-4738-bb36-36787e1a8856 Version: \$LATEST
END RequestId: dc384464-3c67-4738-bb36-36787e1a8856
REPORT RequestId: dc384464-3c67-4738-bb36-36787e1a8856 Duration: 39.35 ms Billed Duration: 40 ms Memory Size: 128 MB Max Memory Used: 72 MB

Now this code has been executed, So go to Postman and execute it

Output of GET Function in Postman:

```

{
    "Item": {
        "EmpName": "Rekha",
        "EmpID": 3162
    },
    "ResponseMetadata": {
        "RequestId": "K27669I9A359G7FJ0KCRG5T0BFVV4KQNS05AEMVJF66Q9ASUAJG",
        "HTTPStatusCode": 200,
        "HTTPHeaders": {
            "Content-Type": "application/x-amz-json-1.0",
            "Content-Length": "100",
            "Connection": "keep-alive",
            "x-amzn-requestid": "K27669I9A359G7FJ0KCRG5T0BFVV4KQNS05AEMVJF66Q9ASUAJG",
            "x-amz-crc32": "708334321"
        },
        "RetryAttempts": 0
    }
}

```