AWS Translate Project Documentation

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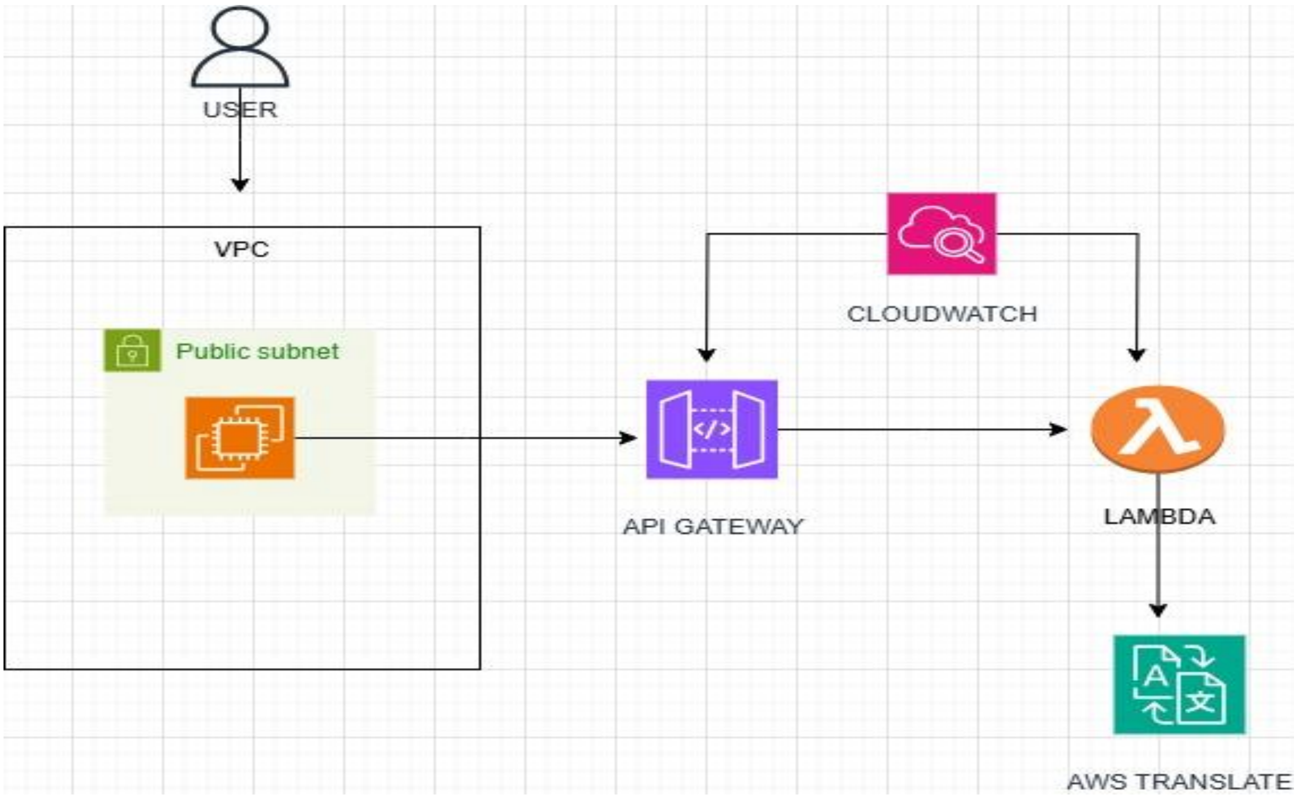
1. Project Overview

Project Name: Multilingual Translation Web App

Description: A web application that allows users to select a target language, input text, and receive translations using AWS Translate. The frontend can be hosted on an Amazon EC2 instance or an s3 bucket for lightweight, cost-efficient serverless application, with translation requests routed through API Gateway and processed by AWS Lambda.

Business Use Case: Helps businesses and users by providing real-time multilingual support for global customers.

2. Architecture diagram



AWS Services Used:

Amazon EC2 – Hosts the frontend (HTML, CSS, JS) and serves it over HTTP/HTTPS.

Amazon API Gateway – Exposes REST endpoints to handle translation requests from the frontend.

AWS Lambda – Processes requests by calling AWS Translate API.

AWS Translate – Provides translation services.

Amazon CloudWatch – Logs API and Lambda execution details.

Workflow

- User visits the web app hosted on EC2.
- User selects target language, enters text, and clicks Translate.
- Frontend JavaScript sends request to API Gateway endpoint.
- API Gateway forwards request to Lambda.
- Lambda calls AWS Translate API.

- Translated text is sent back to API Gateway.
- API Gateway returns response to the EC2 frontend.
- Frontend displays translated text to the user.

3. Deployment & Configuration

Terraform manages all resources

Full code and config can be found in this GitHub repo

Provisioning:

- EC2 instance launched with a web server (Apache) to serve frontend files.
- API Gateway deployed with a POST method integrated with Lambda.
- Lambda configured with AWS Translate permissions.

Key Configuration Details:

- EC2 instance in a public subnet, secured with a Security Group allowing HTTP/HTTPS.
- API Gateway with CORS enabled to accept requests from EC2 frontend domain.
- Lambda uses IAM execution role with TranslateText permission.

4. Security & Permissions

EC2:

Security Group restricted to HTTP/HTTPS inbound only.

Key pair used for secure SSH access.

API Gateway:

Secured with API keys or Cognito authentication (optional).

IAM Roles:

Lambda role restricted to Translate and CloudWatch logging.

Network Security:

VPC rules to isolate backend resources.

5. Monitoring & Logging

EC2: OS-level monitoring with CloudWatch Agent.

Lambda: Logs stored in CloudWatch for debugging.

API Gateway: Access and error logs enabled.

Metrics Monitored: API Gateway error rates, Lambda execution failures, EC2 CPU/Memory.

6. Cost Considerations

EC2: Ongoing hourly cost depending on instance type.

AWS Translate: Pay per character translated.

API Gateway: Billed per API request.

Lambda: Pay per execution time.

Optimization: Use a small EC2 instance (t2.micro under Free Tier) for frontend; batch translations to reduce Translate calls.

7. Future Improvements

- Replace EC2 with S3 static hosting + CloudFront for a fully serverless architecture.
- Add authentication via Cognito for secured access.
- Add DynamoDB to log and store translation history.
- Implement CI/CD pipeline to update frontend and backend automatically.

8. References

[AWS Translate Documentation](#)

[Amazon EC2 Documentation](#)

[Amazon API Gateway Documentation](#)

[AWS Lambda Documentation](#)

9. Proof of Concept

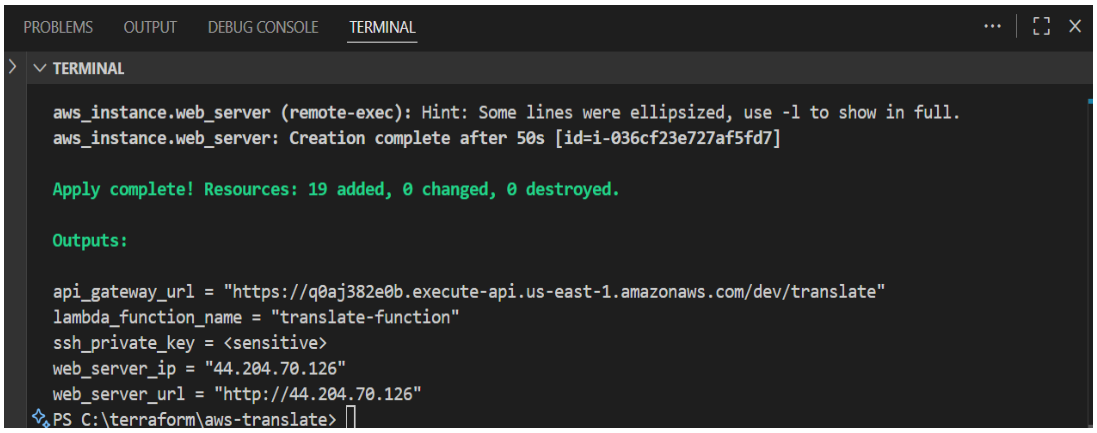
Overview

This proof of concept demonstrates a real-time translation application built on AWS.
The solution hosts a frontend on Amazon EC2, which sends translation requests via Amazon API Gateway. The requests invoke an AWS Lambda function, which uses Amazon Translate to return translated text.

This PoC validates the end-to-end workflow for live multilingual communication.

Screenshots / Resource Verification

After Terraform apply, the web server can be accessed through the outputs by clicking on the web server url provided.



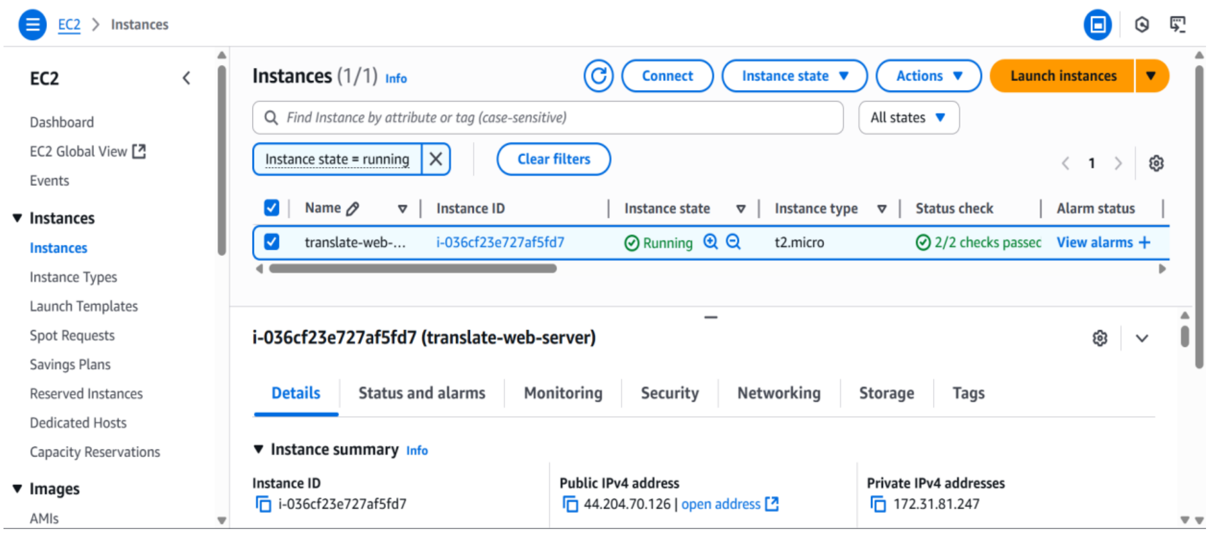
```
aws_instance.web_server (remote-exec): Hint: Some lines were ellipsized, use -l to show in full.
aws_instance.web_server: Creation complete after 50s [id=i-036cf23e727af5fd7]

Apply complete! Resources: 19 added, 0 changed, 0 destroyed.

Outputs:

api_gateway_url = "https://q0aj382e0b.execute-api.us-east-1.amazonaws.com/dev/translate"
lambda_function_name = "translate-function"
ssh_private_key = <sensitive>
web_server_ip = "44.204.70.126"
web_server_url = "http://44.204.70.126"
PS C:\terraform\aws-translate>
```

Screenshot of EC2 instance running frontend.


EC2 > Instances

Instances (1/1) Info

Instance state = running

Name	Instance ID	Instance state	Instance type	Status check	Alarm status
translate-web-...	i-036cf23e727af5fd7	Running	t2.micro	2/2 checks passec	View alarms +

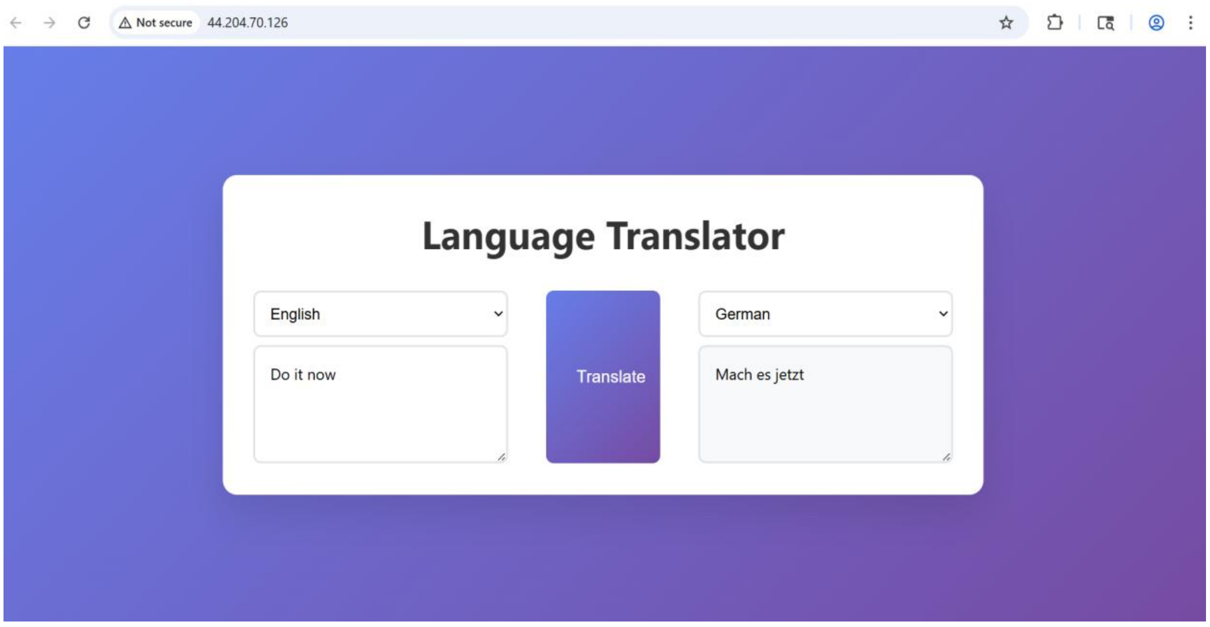
i-036cf23e727af5fd7 (translate-web-server)

Instance summary

Instance ID: i-036cf23e727af5fd7

Public IPv4 address: 44.204.70.126 | open address

Private IPv4 addresses: 172.31.81.247


Not secure 44.204.70.126

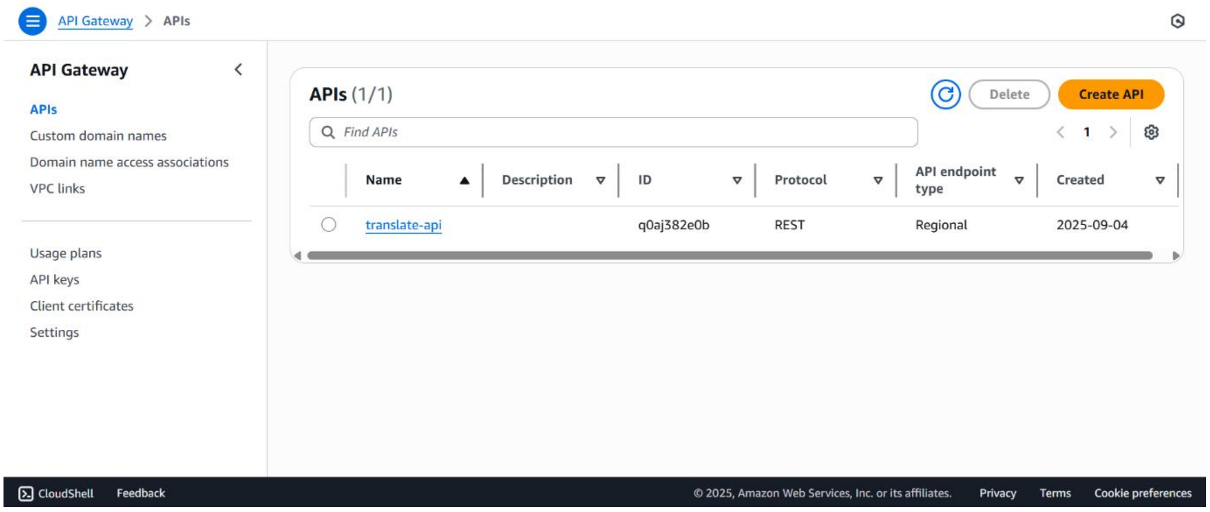
Language Translator

English: Do it now

German: Mach es jetzt

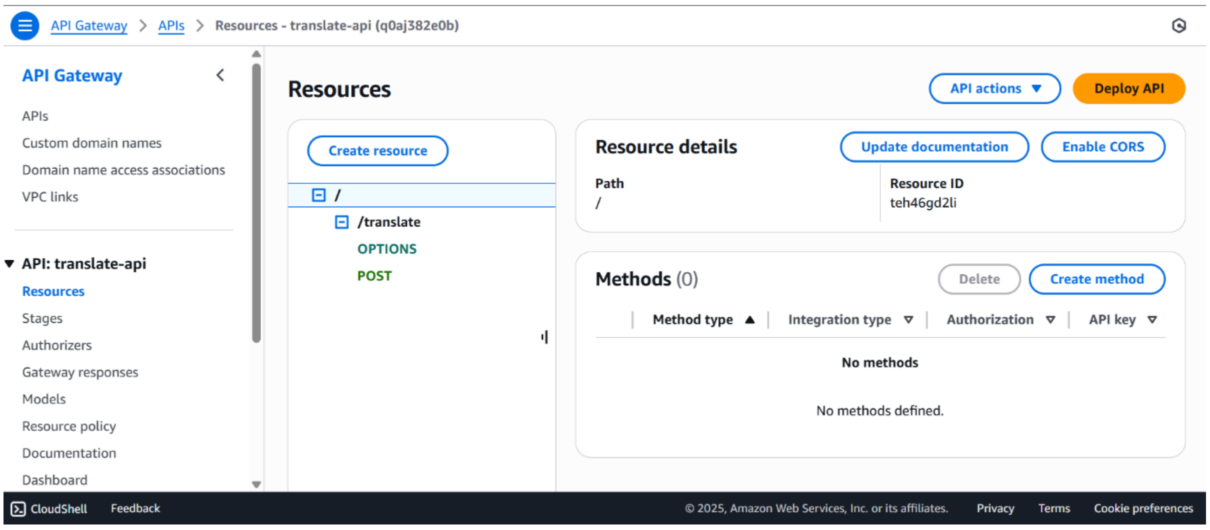
Watch the full video demo here

Screenshot of API Gateway endpoint.



APIs (1/1)

Name	Description	ID	Protocol	API endpoint type	Created
translate-api		q0aj382e0b	REST	Regional	2025-09-04



Resource details

Path
/

Resource ID
teh46gd2li

Methods (0)

Method type	Integration type	Authorization	API key

No methods

No methods defined.

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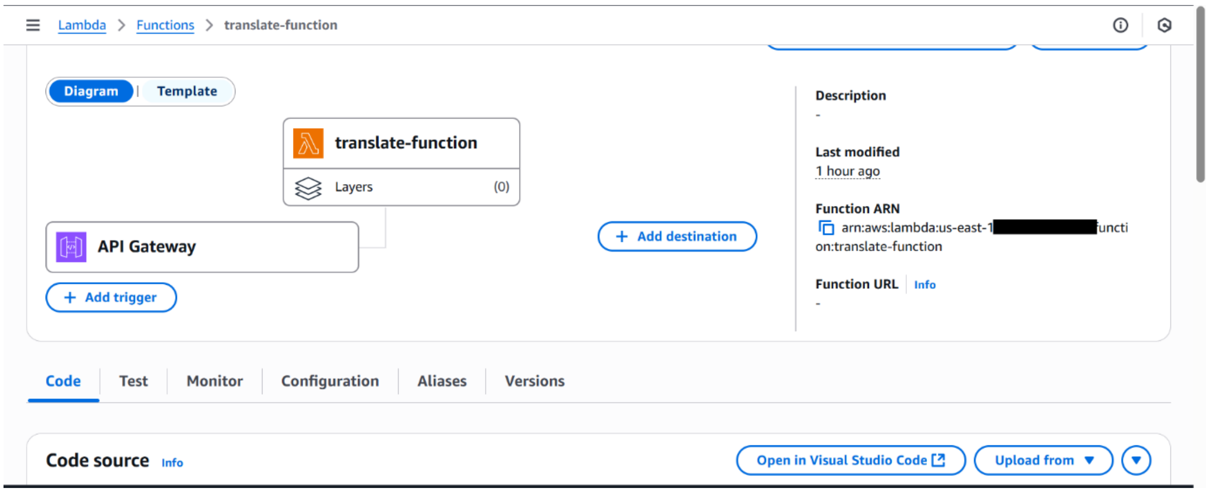
Screenshot of Lambda and its logs in CloudWatch.

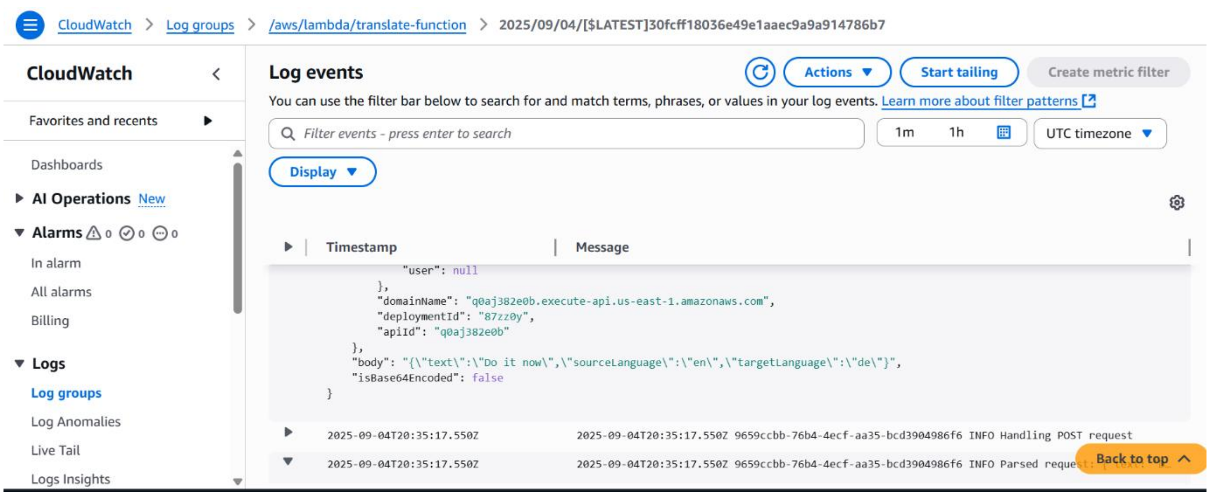


Description
-

Last modified
1 hour ago

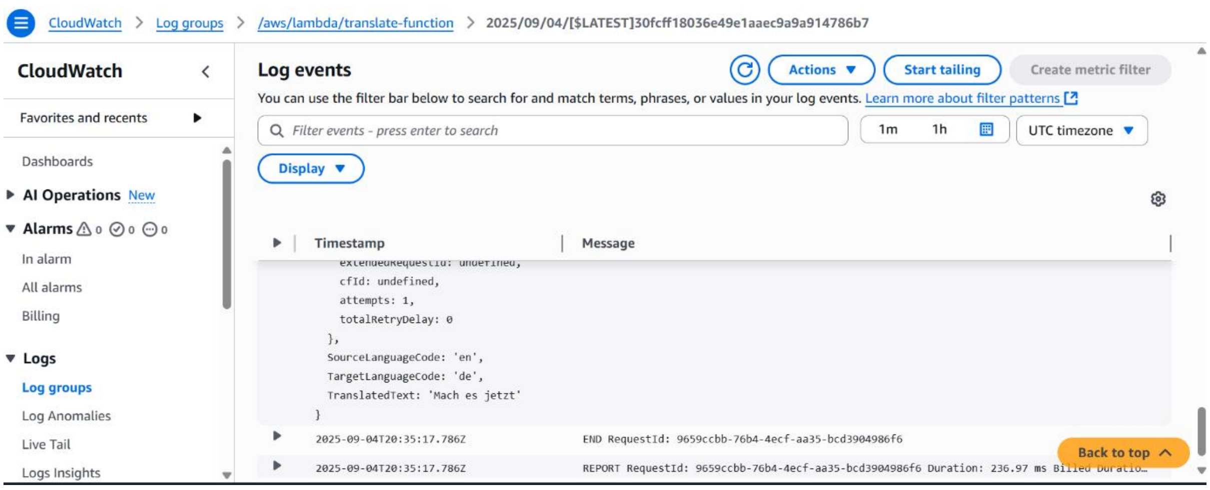
Function ARN
arn:aws:lambda:us-east-1[redacted]function:translate-function

Function URL Info
-



You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns

```
Timestamp                    Message
                "user": null
            },
            "domainName": "q0aj382e0b.execute-api.us-east-1.amazonaws.com",
            "deploymentId": "87zz0y",
            "apiId": "q0aj382e0b"
        },
        "body": "{\"text\":\"Do it now\",\"sourceLanguage\":\"en\",\"targetLanguage\":\"de\"}",
        "isBase64Encoded": false
    }
2025-09-04T20:35:17.550Z    2025-09-04T20:35:17.550Z 9659ccbb-76b4-4ecf-aa35-bcd3904986f6 INFO Handling POST request
2025-09-04T20:35:17.550Z    2025-09-04T20:35:17.550Z 9659ccbb-76b4-4ecf-aa35-bcd3904986f6 INFO Parsed reque
```



You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns

```
Timestamp                    Message
      extendedRequestId: undefined,
      cfId: undefined,
      attempts: 1,
      totalRetryDelay: 0
    },
    SourceLanguageCode: 'en',
    TargetLanguageCode: 'de',
    TranslatedText: 'Mach es jetzt'
  }
2025-09-04T20:35:17.786Z    END RequestId: 9659ccbb-76b4-4ecf-aa35-bcd3904986f6
2025-09-04T20:35:17.786Z    REPORT RequestId: 9659ccbb-76b4-4ecf-aa35-bcd3904986f6 Duration: 236.97 ms Billed Duratio…
```

Watch the full video demo here