
AWS
re:Invent

SVS202

Getting started building your first serverless web application

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AWS

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Great ideas

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Serverless

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Magic ✨

A little background

- Studied Chinese since 2009
- Began learning to code and joined AWS as a partner development manager in 2018
- Develop apps as a hobby



The app idea

A web application that sends daily emails with vocabulary words at your Chinese level

Requirements:

- User-facing website
- Contact management
- Storage to review previous words
- Subscription analytics

Why choose serverless?



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Serverless means

- ✓ No server management
- ✓ Flexible, automated scaling
- ✓ Pay for value
- ✓ Automated high availability

Experiment more, build faster

Development walkthrough



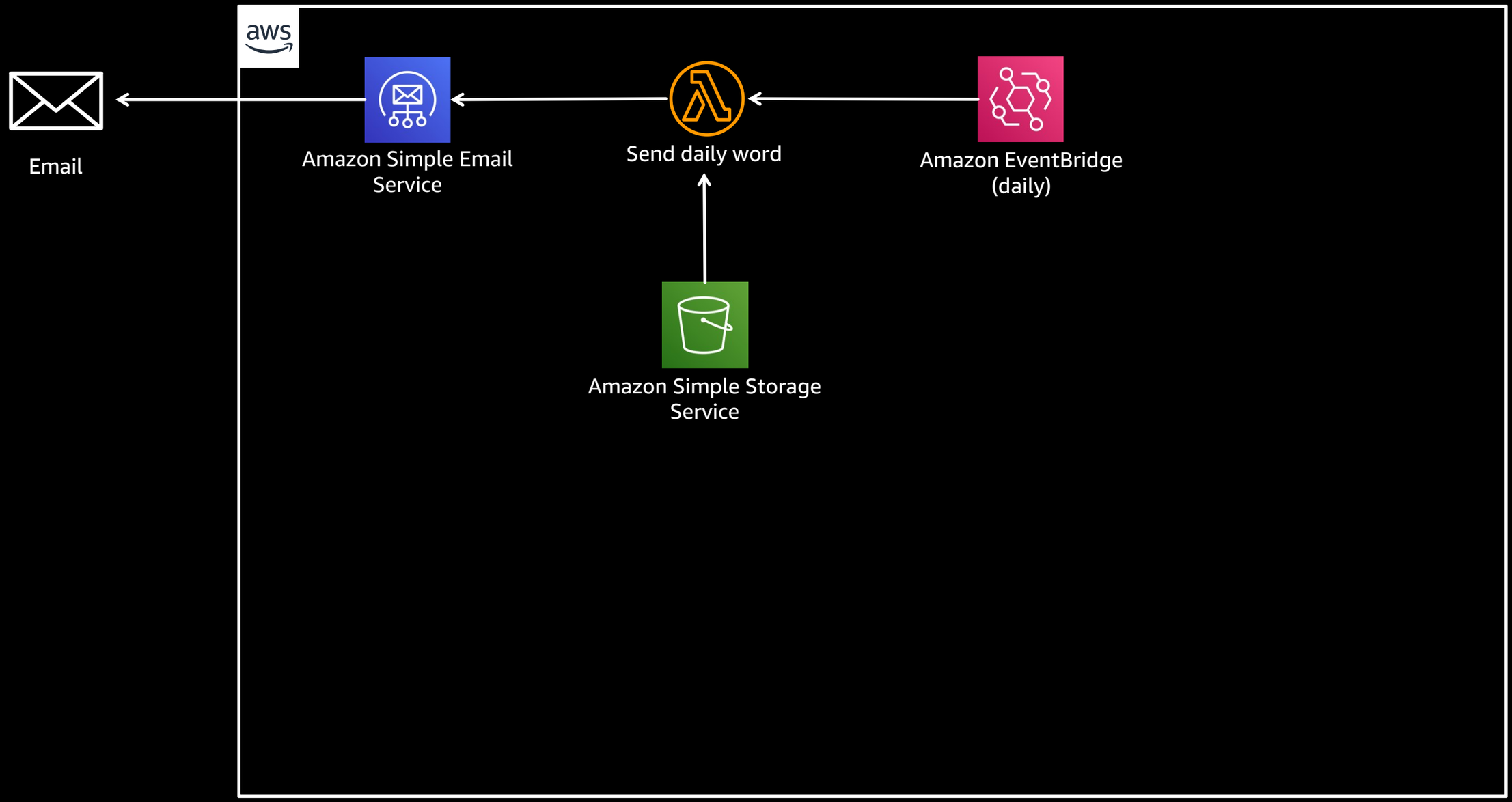
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Think in terms of event-driven workflows

Sending daily emails



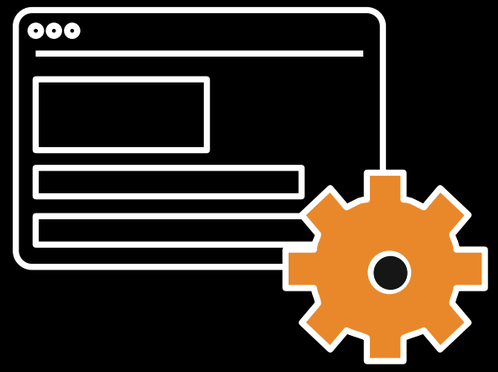
Example Lambda function code

```
import boto3
ses_client = boto3.client('ses', region_name='us-east-1')

def lambda_handler(event, context):

  # Pull email recipient address, subject line, and message body from S3

  try:
      response = ses_client.send_email(
        Source = "AnSESRegisteredEmail <from_address@domain.com>",
        Destination = {"ToAddresses" : [email_address]},
        Message = {
            "Subject": {
            "Charset": "UTF-8",
            "Data": email_subject
            },
            "Body": {
                "Html": {
                    "Charset": "UTF-8",
                    "Data": email_body
      }}})
  except Exception as e:
      print(f"Error: Failed to send email.", e)
```



APIs are the front door to your application

Simplified (简体字) Traditional (繁体字)

好HAOHAOTIANTIAN

chinese language learning

Home Quiz Review

Subscribe to receive daily vocab word emails.

Choose an HSK Level | Email address | Subscribe

Which HSK level are you?

Click on each level below to see sample words, or check out recent daily words.

- Level 1
- Level 2
- Level 3
- Level 4
- Level 5

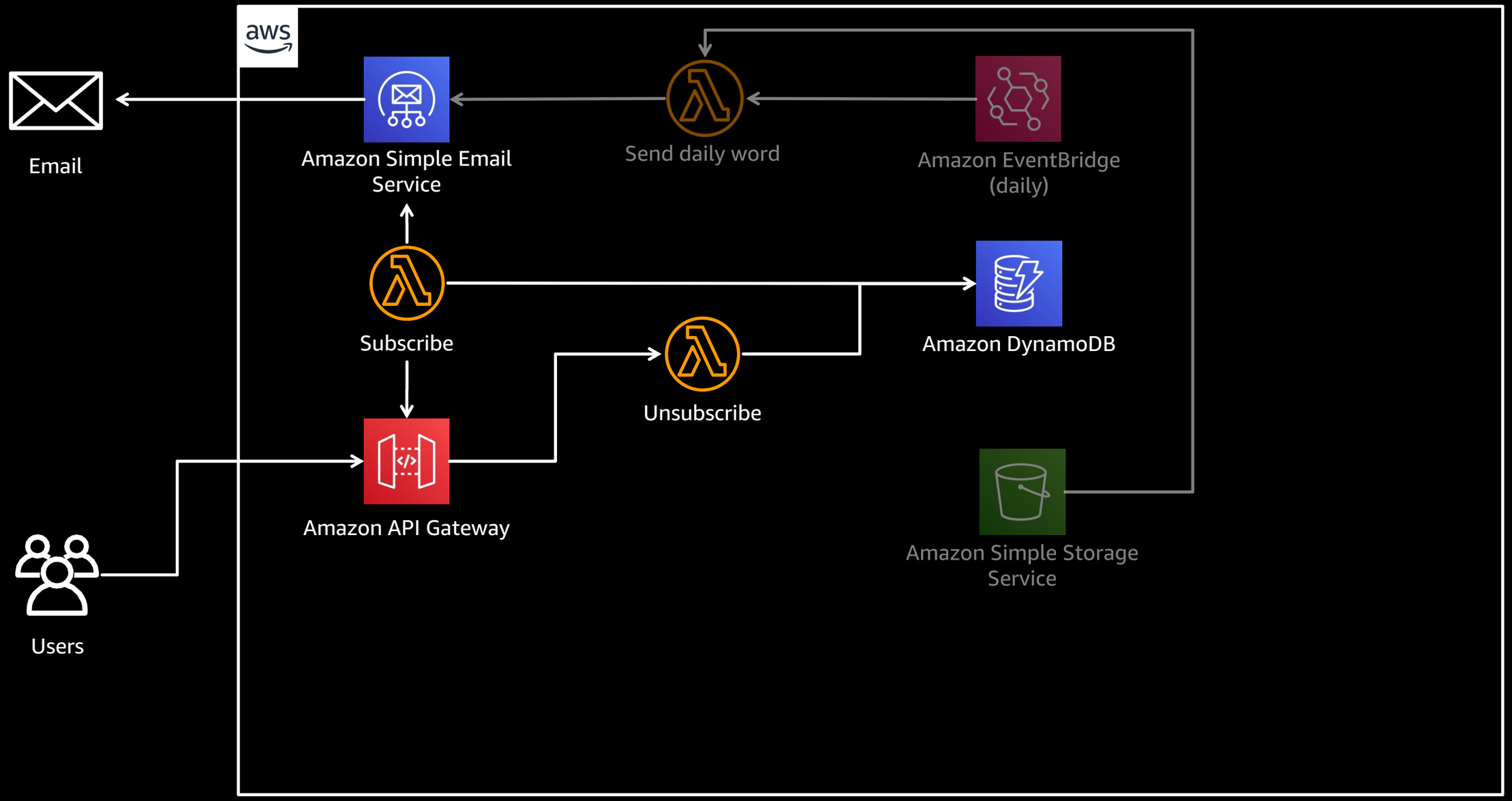
我

wǒ

I; me; my

前面

Subscribe/unsubscribe API



Simplified (简体字) Traditional (繁体字)

好HAOHAOTIANTIAN
chinese language learning

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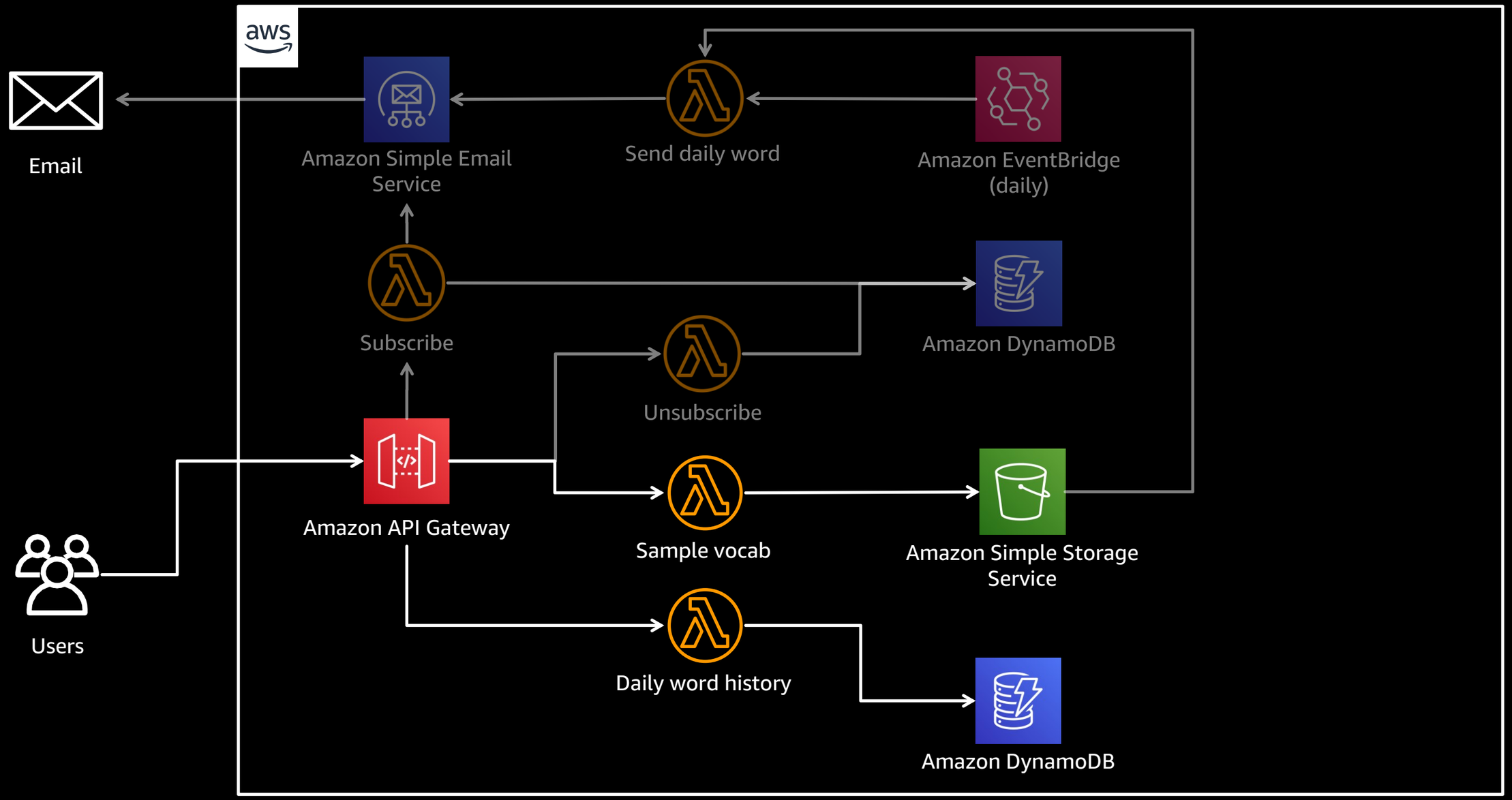
我

wǒ

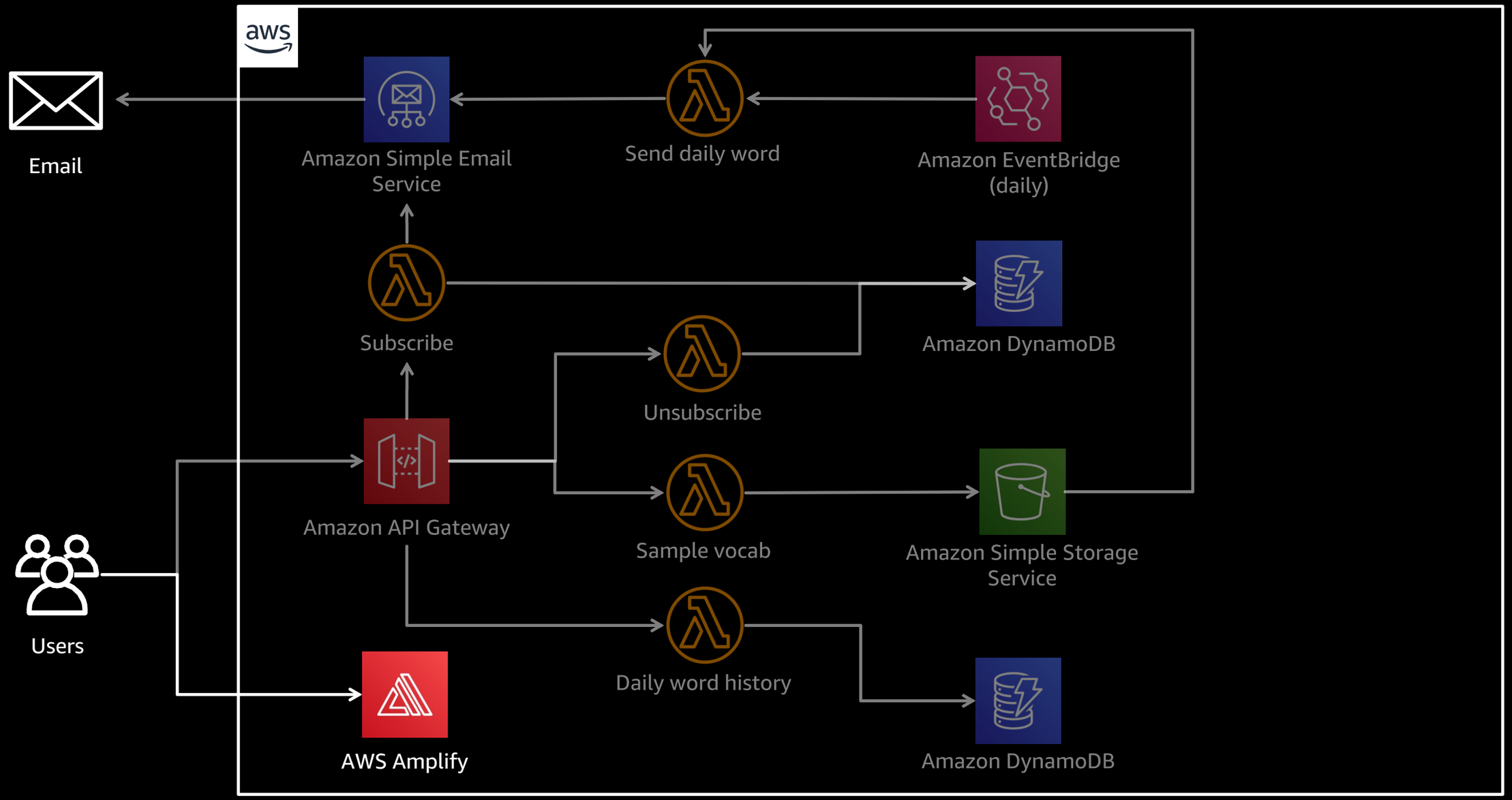
I; me; my

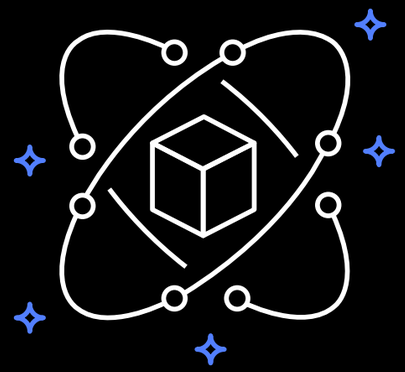
前面

Previous daily words API



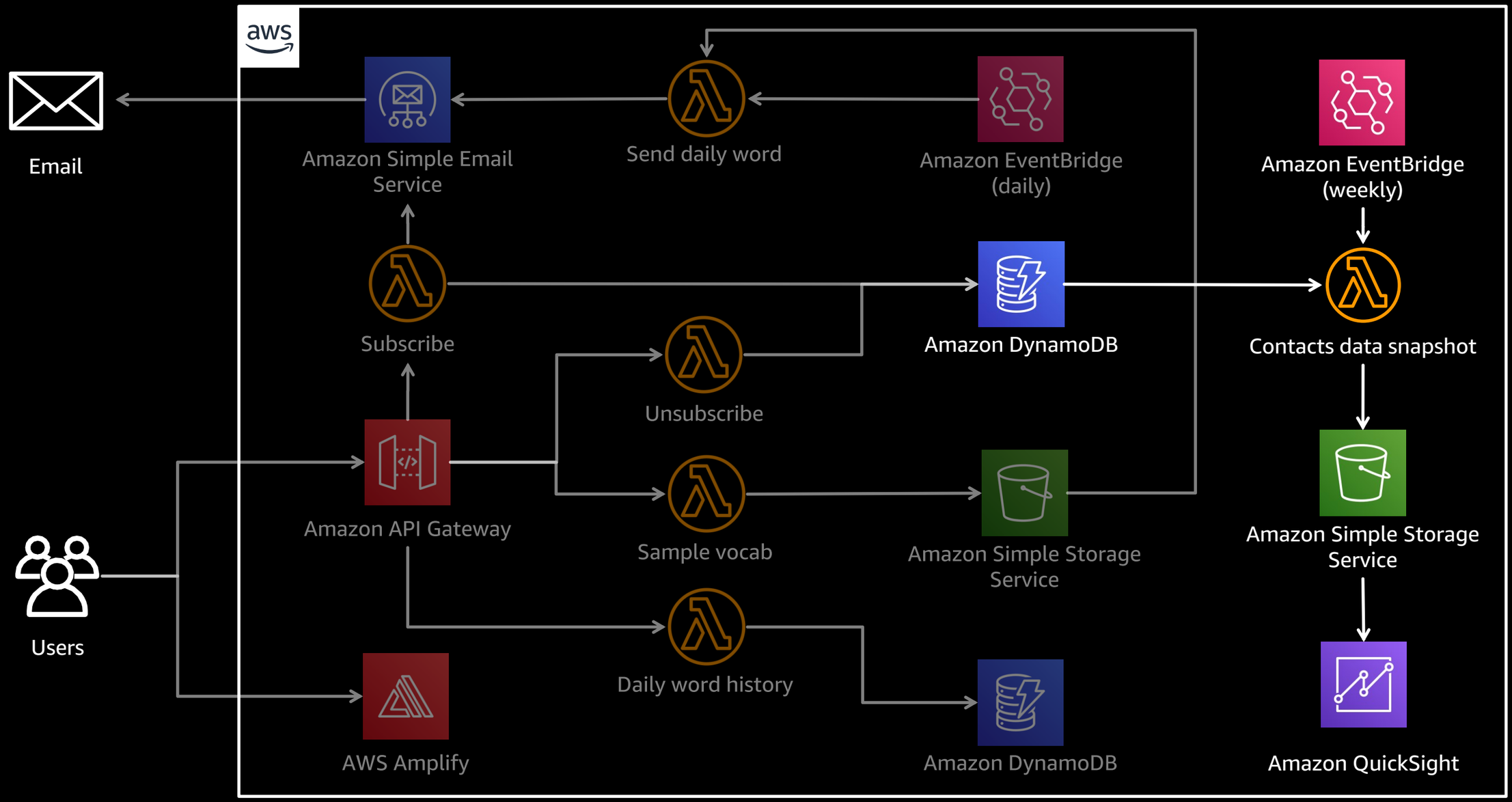
Static, low latency front end



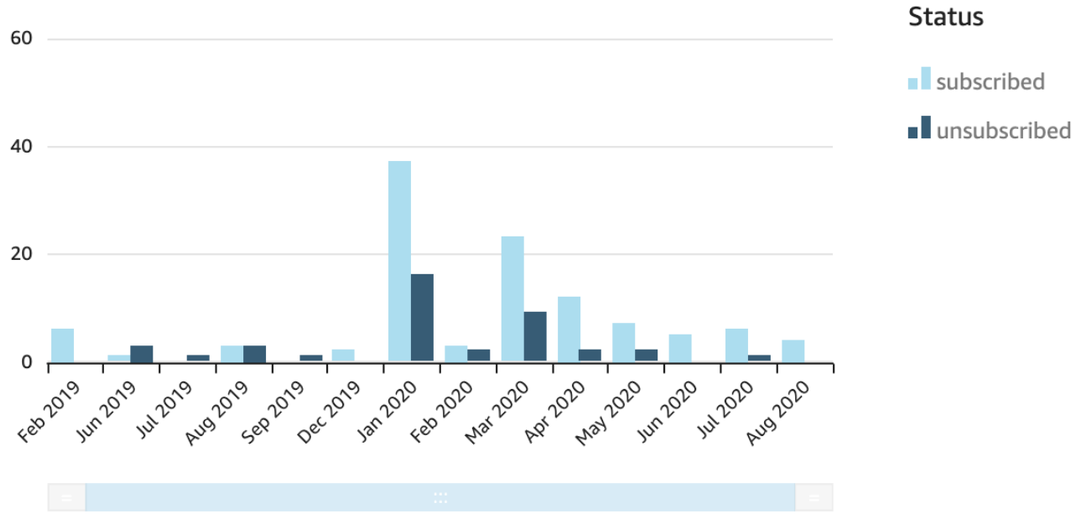


Start small and add complexity with additional microservices

Subscriber analytics dashboard



Subscribed & Unsubscribed Over Time



Total Subscriptions Ever

149

Total Active Subscriptions

109

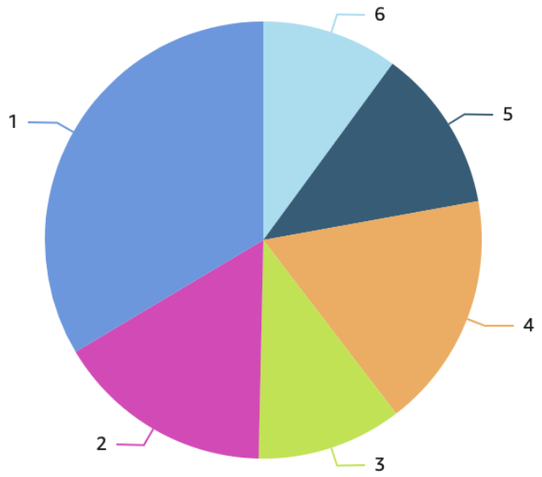
WoW Subscriptions

0

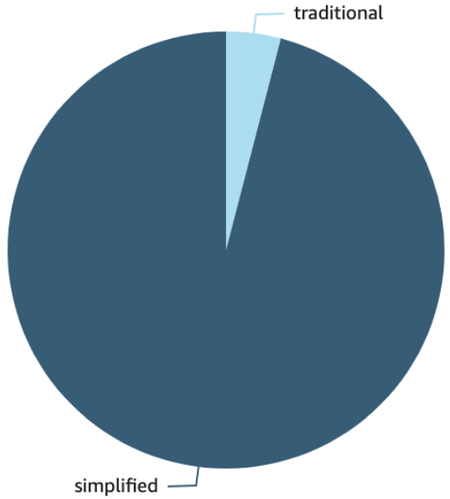
Unique Active Subscribers

91

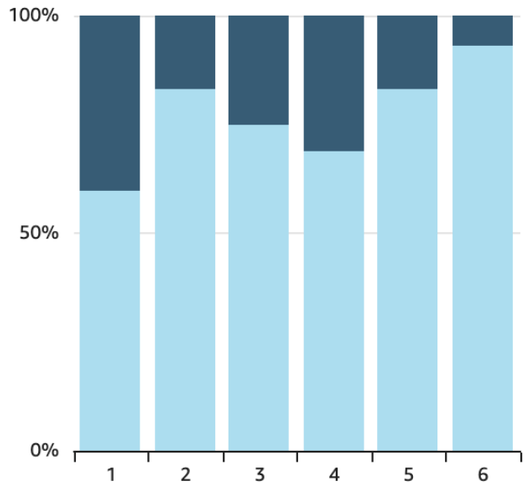
Subscriptions by Vocab Level



Subscriptions by Character Set



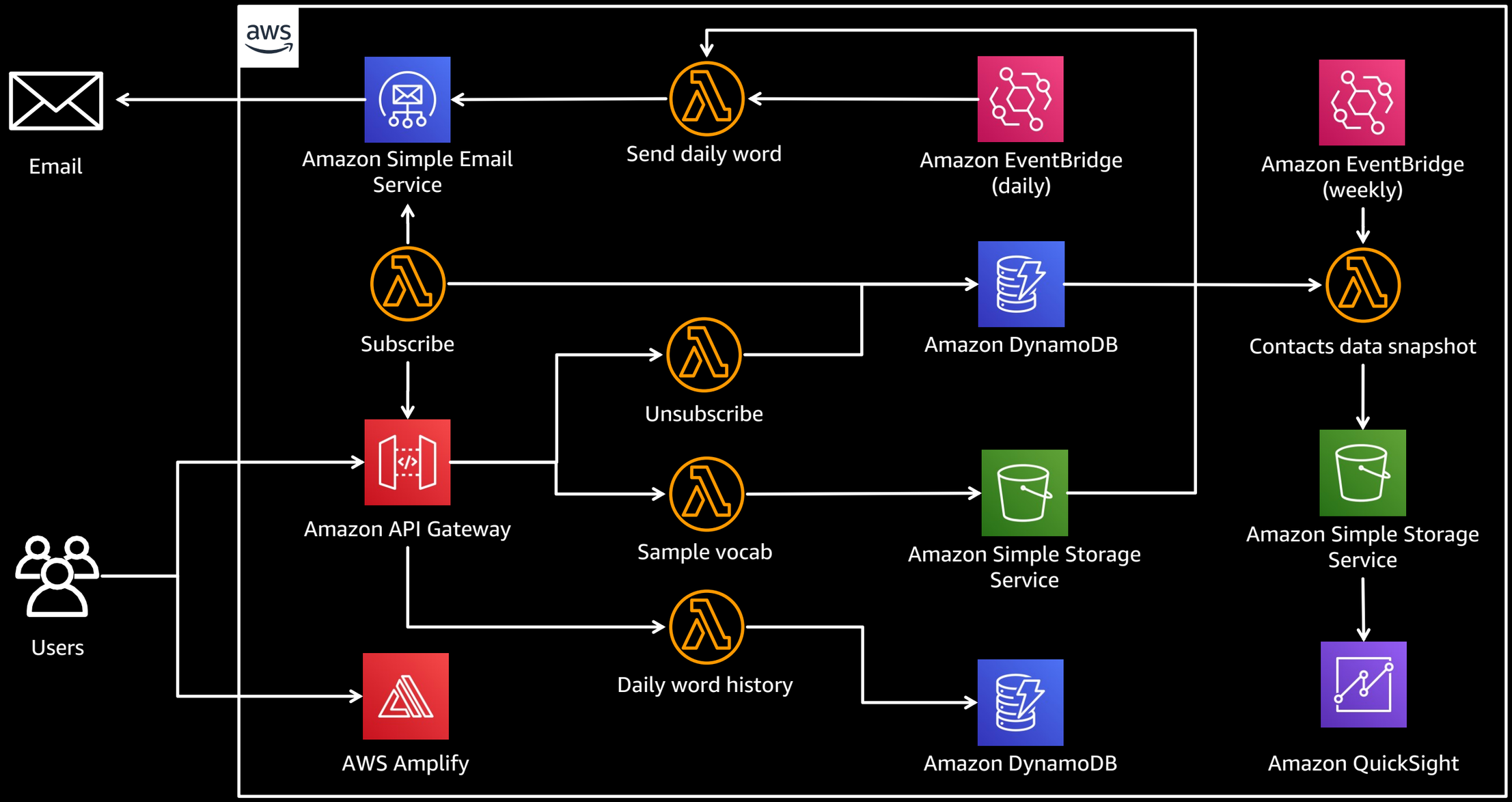
Unsubscribe Rate by Vocab Level



Future extensions of the app

- Generate automated quizzes using the existing word history API
- Create user profiles and quiz leaderboards by adding authentication

Full application architecture





Set up an automated development workflow

Simple serverless CI/CD pipeline



Application is defined using a serverless development framework

Code is uploaded to a repository

New code triggers a new build process

New application code is deployed

Example SAM template

```yaml
AWSTemplateFormatVersion: '2010-09-09'
Transform: 'AWS::Serverless-2016-10-31'
Description: An app that sends daily text messages.
Parameters:
  MyPhoneNumber:
    Type: String

Resources:
  SendTextFunction:
    Type: 'AWS::Serverless::Function'
    Properties:
      FunctionName: SendTextFunction
      Handler: send_text_function.lambda_handler
      Runtime: python3.8
      Policies:
      - SNSPublishMessagePolicy:
          TopicName: !GetAtt SendTextSNSTopic.TopicName
      Environment:
        Variables:
          MY_PHONE_NUMBER: !Ref MyPhoneNumber
          SNS_TOPIC_ARN: !Ref SendTextSNSTopic
      Events:
        DailyEventBridgeEvent:
          Type: Schedule
          Properties:
            Schedule: cron(0 20 * * ? *)

  # SendTextSNSTopic resource below
```

Getting-started tips:

- Start small and increase complexity over time
- Think in terms of event-driven workflows
- Create well-defined APIs for future extensibility
- Set up an automated development workflow

Resources

Related tutorials

- serverlessland.com/reinvent2020/svs202

Check out the daily Chinese vocab app

- Website: haohaotiantian.com
- Repository: github.com/em-shea/vocab

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Thank you!



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