CS55A course project presentation

Wild Rydes platform on AWS

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Components of the platform and how it designed

Systems Architect use AWS S3, Amazon Cognito, AWS Lambda, Amazon DynamoDB, Amazon API Gateway to implement our website.

Static Web Hosting

The AWS S3 holds all the files and packages such as JavaScript, HTML, CSS, image of the static web site. We can access WildRydes web site by using the URL it provide.

User Management

Amazon Cognito let us manage which user can access our website at the backend to secure API.

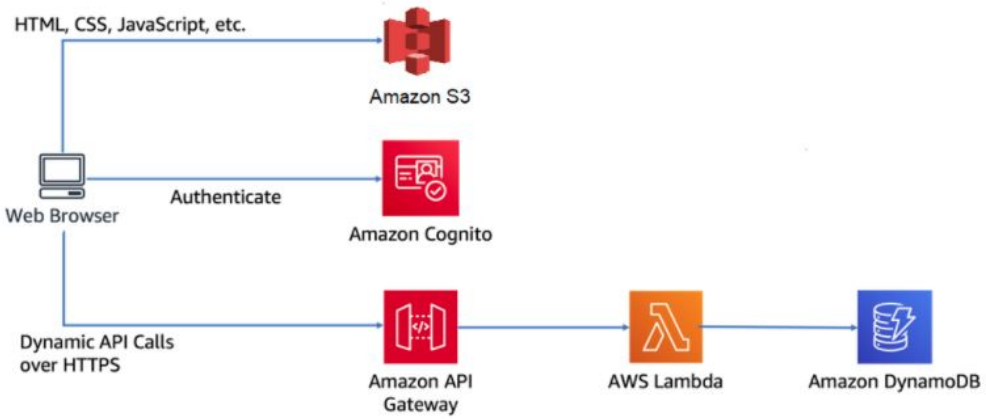
Serverless Backend

Amazon Lambda plays the role to run the code to conduct the API request from the platform application. The requestUnicorn.js code can implement dispatch a unicorn on the web site as the new Lambda function.

After the fuction selected a unicorn from the fleet, DynamoDB stored the request record. IAM role grants the Lambda function permission to write logs to Amazon CloudWatch Logs and access to write items to your DynamoDB table.

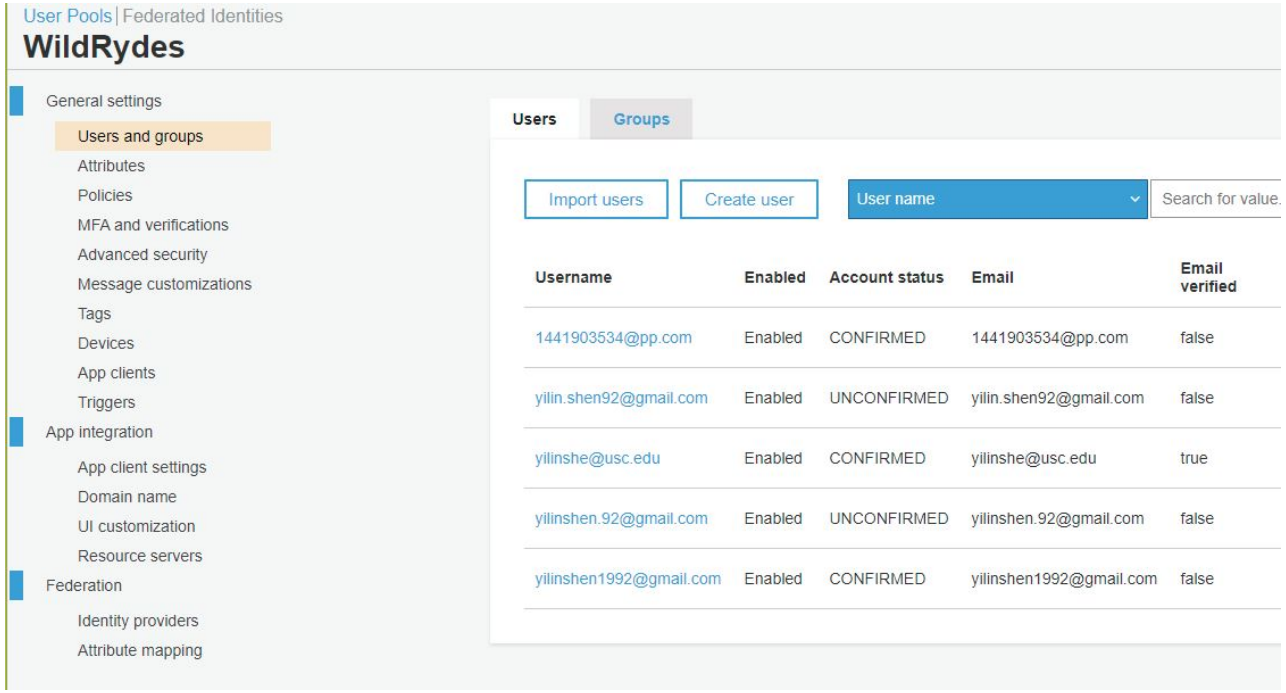
RESTful API

Amazon API Gateway can make the Lambda function as a RESTful API. It will be secured using the Amazon Cognito. This will also turn the statically hosted website into a dynamic web application.



Systems Architect structure chart

Amazon Cognito role in platform implementation?



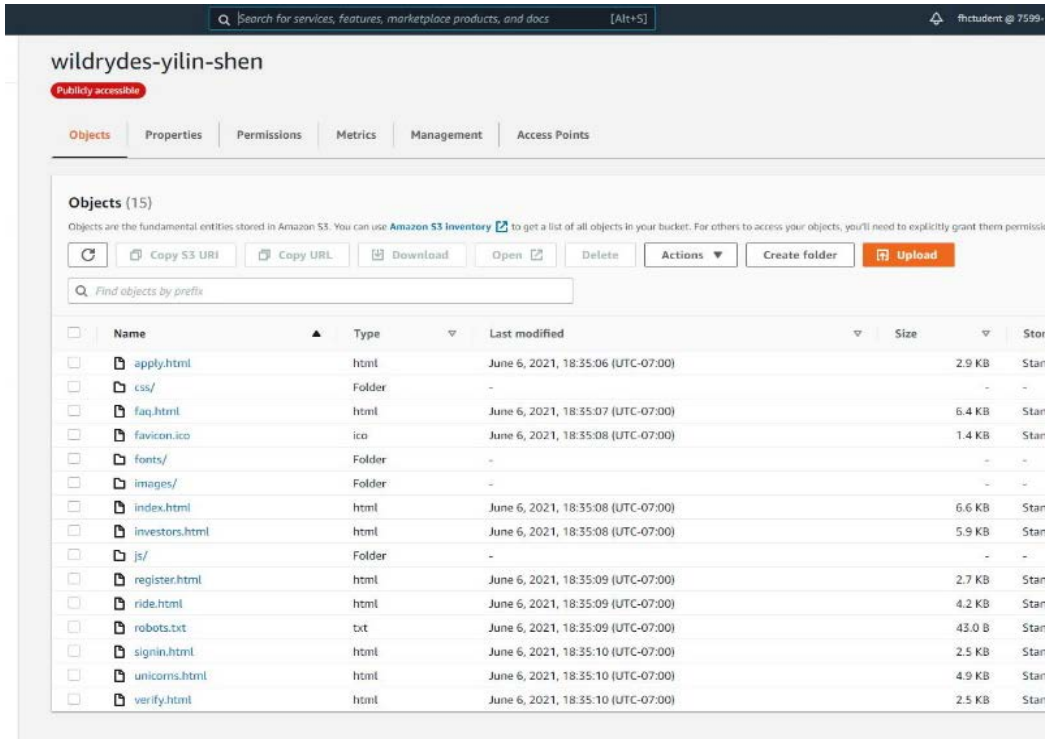
Users requested to register

- Amazon Cognito user pool can confirm the user account status. If the user use a real email address and verify by the verification code he/she can sign in.
- If the user use a dummy email address, we have to confirm the user manually through the Cognito console.
- If the user didn’t successfully complete registration, he/she can’t login and go to the next map section.

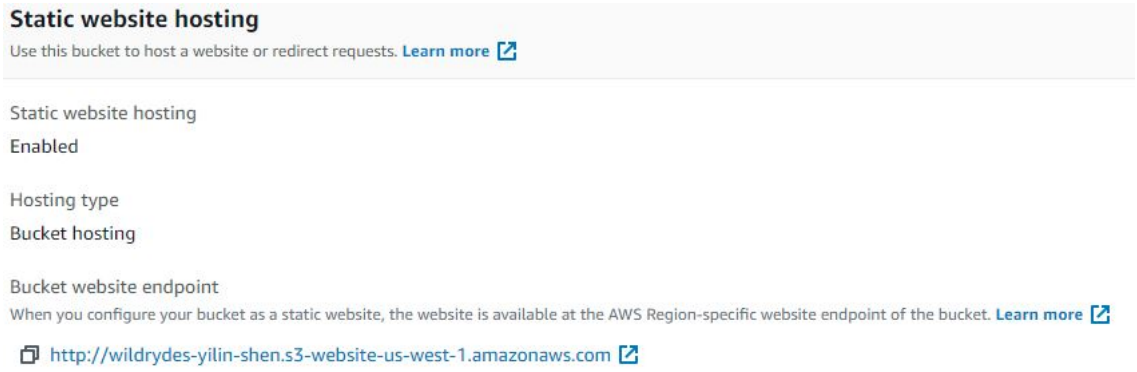
Amazon S3 roles for the platform

Amazon S3 has the bucket holds all the static web content, such as html files, codes files, css files, txt files, images, packages and all other find of information.

The URL under S3 properties static website hosting allow access to the public website.



Amazon S3 bucket holds objects



URL to the public website

Amazon S3 roles for the platform – bucket policy

We using buckets policy to define who can access the bucket. The code in screenshots provide the bucket name that will be allow to access. JSON documents specify what principals are allowed to execute various actions against the objects in bucket.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": "*",
            "Action": "s3:GetObject",
            "Resource": "arn:aws:s3:::[YOUR_BUCKET_NAME]/*"
        }
    ]
}
```

screenshot JSON documents

What role does Amazon Lambda play in the platform? What does the code do?

Amazon Lambda plays the role to run the code to conduct the API request from the platform application.

The requestUnicorn.js code can implement dispatch a unicorn on the web site as the new Lambda function.

Lambda function for requesting a Unicorn to come pick us up. Part of the WildRydes AWS application

requestUnicorn.js

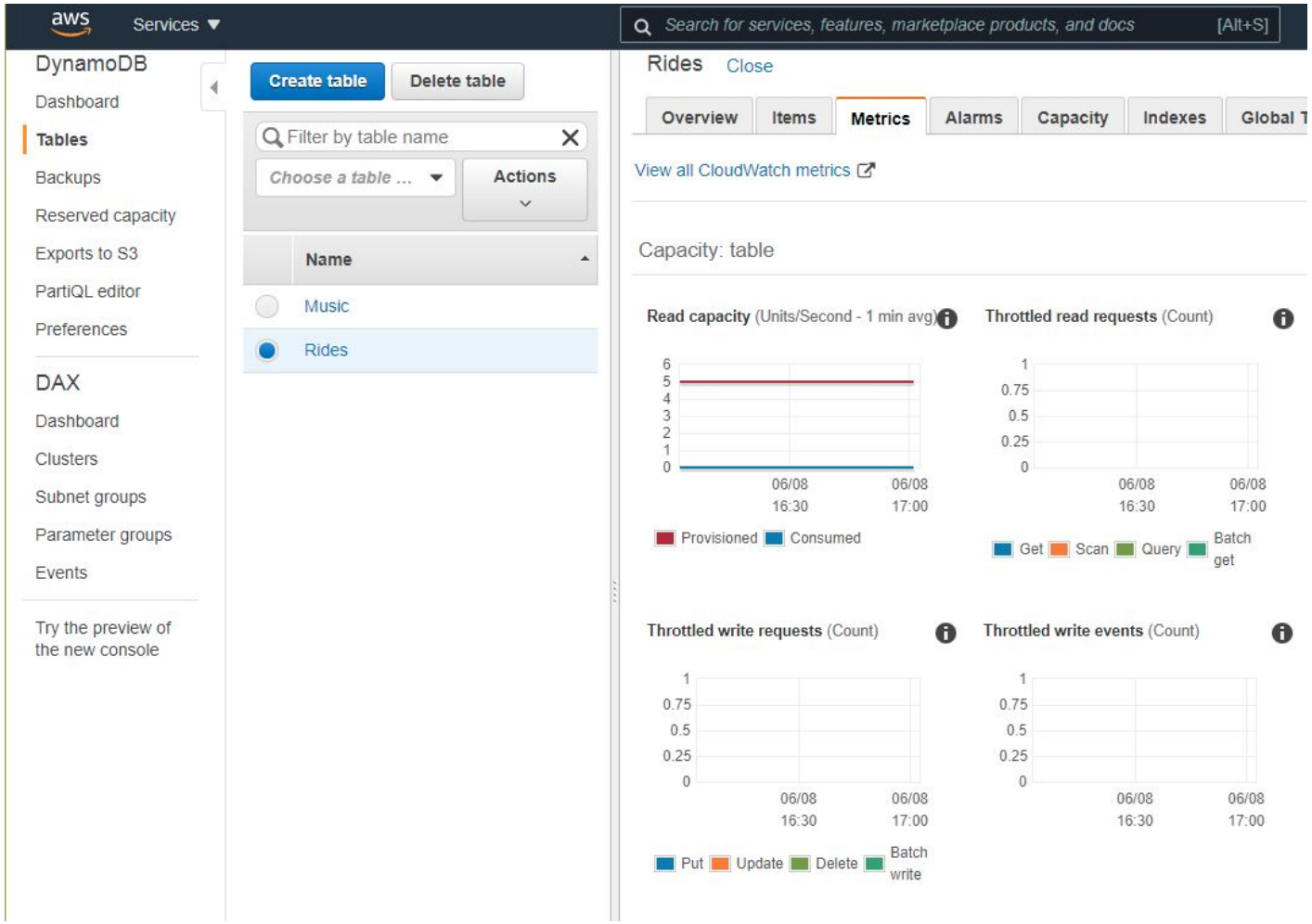
```
1  const randomBytes = require('crypto').randomBytes;
2
3  const AWS = require('aws-sdk');
4
5  const ddb = new AWS.DynamoDB.DocumentClient();
6
7  const fleet = [
8      {
9          Name: 'Bucephalus',
10         Color: 'Golden',
11         Gender: 'Male',
12     },
13     {
14         Name: 'Shadowfax',
15         Color: 'White',
16         Gender: 'Male',
17     },
18     {
19         Name: 'Rocinante',
20         Color: 'Yellow',
21         Gender: 'Female',
22     },
23 ];
24
25 exports.handler = (event, context, callback) => {
26     if (!event.requestContext.authorizer) {
27       errorResponse('Authorization not configured', context.awsRequestId, callback);
28       return;
29     }
```

part of requestUnicorn.js

What Amazon DynamoDB store & IAM role grant

After the fuction selected a unicorn from the fleet, DynamoDB stored the request record.

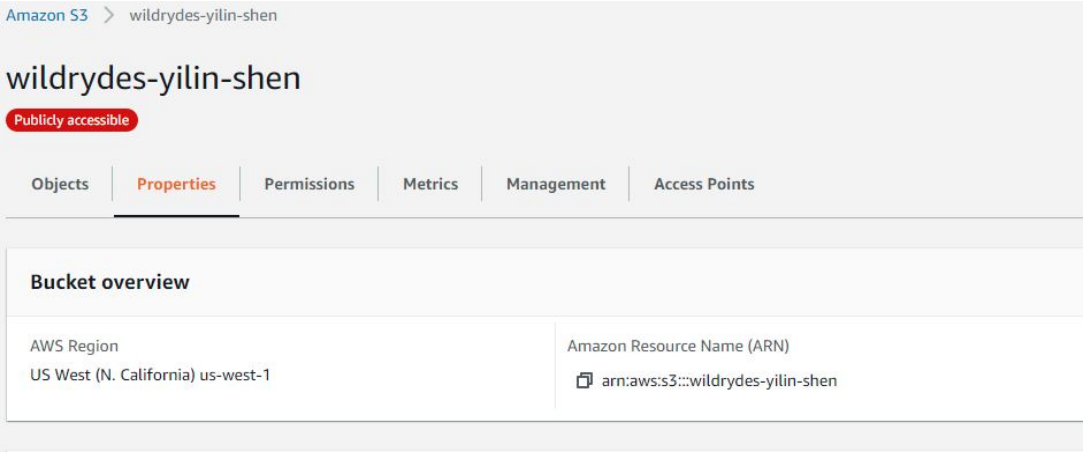
IAM role grants the Lambda function permission to write logs to Amazon CloudWatch Logs and access to write items to your DynamoDB table.



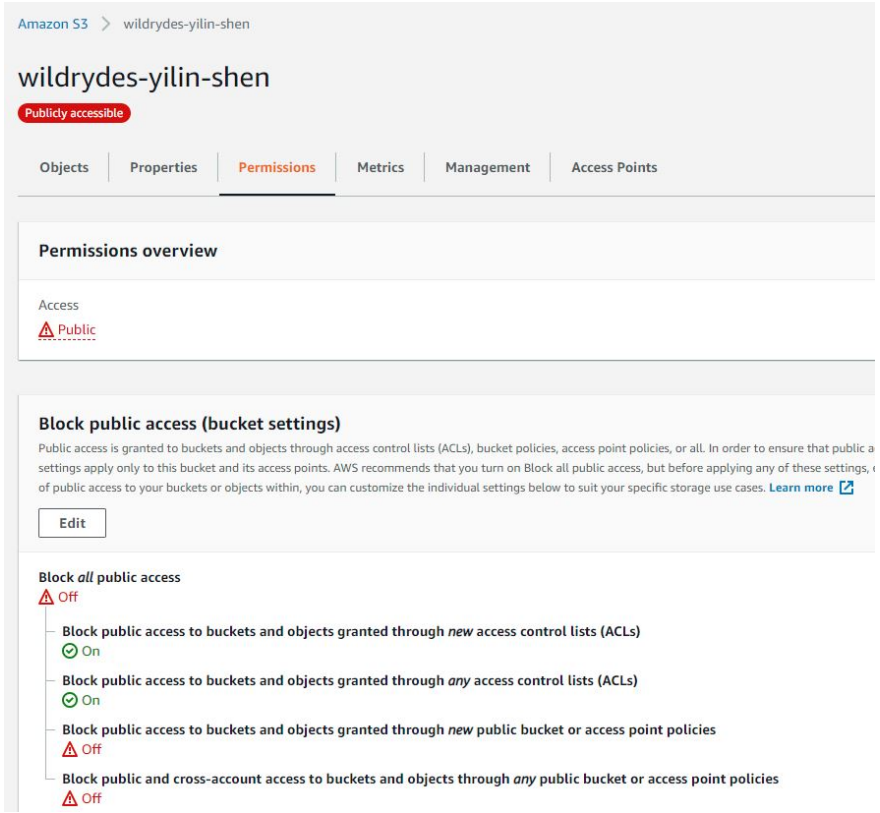
Amazon CloudWatch metrics, alarms under the DynamoDB

Design Choices made along the way

- Selected US West (N.California) us-west-1 region. Because most of the design base and unicorn call service will be in Bay area.
- In Public access setting, only blocked "Block new public bucket policies“ and "Block public and cross-account access if bucket has public policies“, since we need to let anonymous users view our site. If block all of them, only authenticated users with access to AWS account



US West (N.California) us-west-1 region

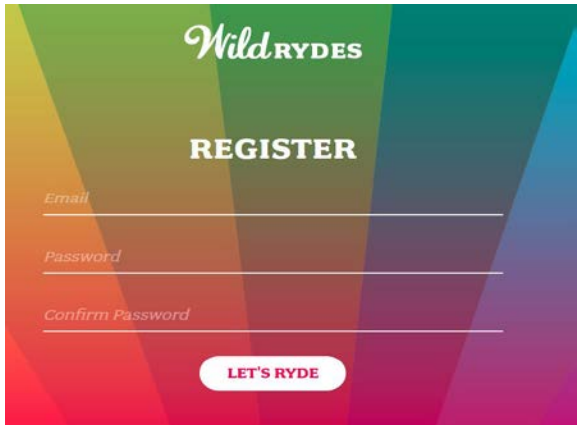


Public access setting

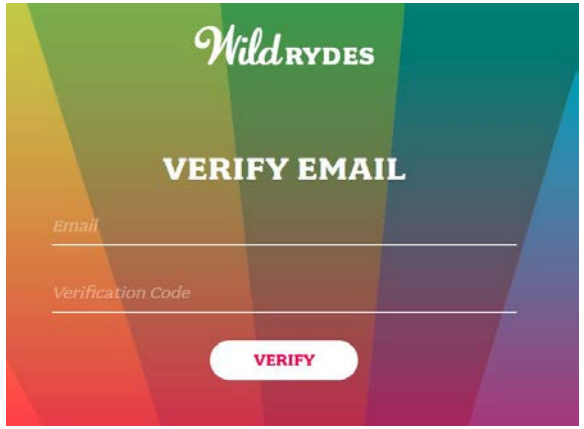
Components including & validations

In the home page under words Wild RYDES user can select GIDDY UP! to register the email address and confirm password. Then goes to verify email inter verification code. After verify user can sign in to use the call unicorn section

home page



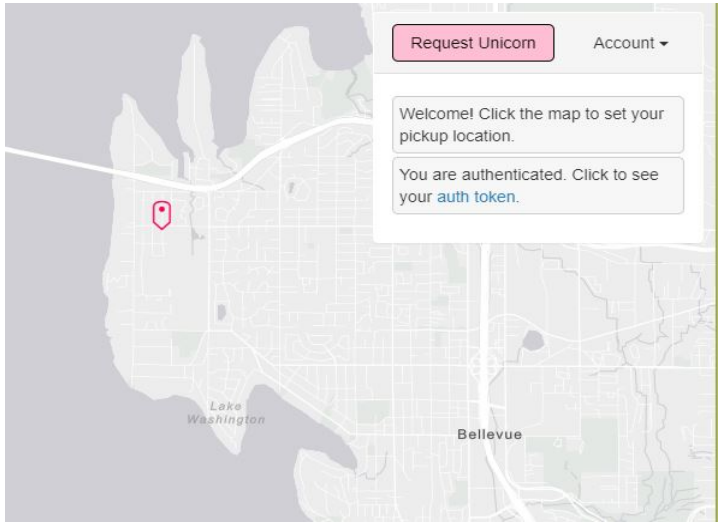
Register page



Verify page

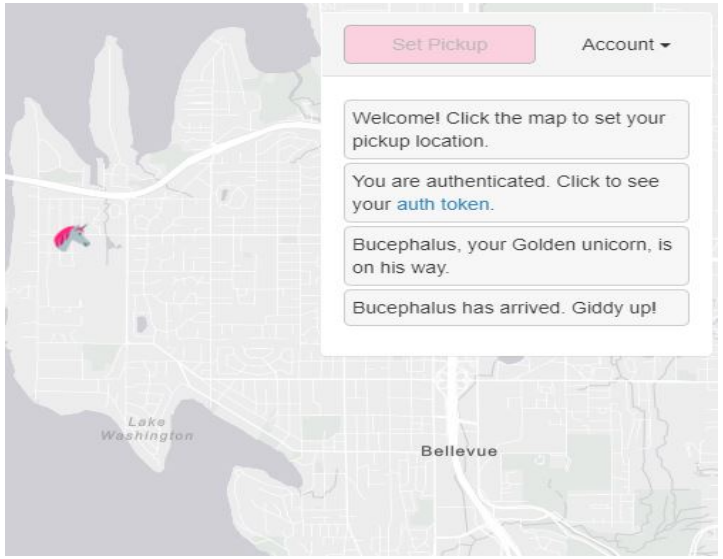
sign in page

Components including & validations



request unicorn map section

- customer first set the Pick up location then request unicorn to come.



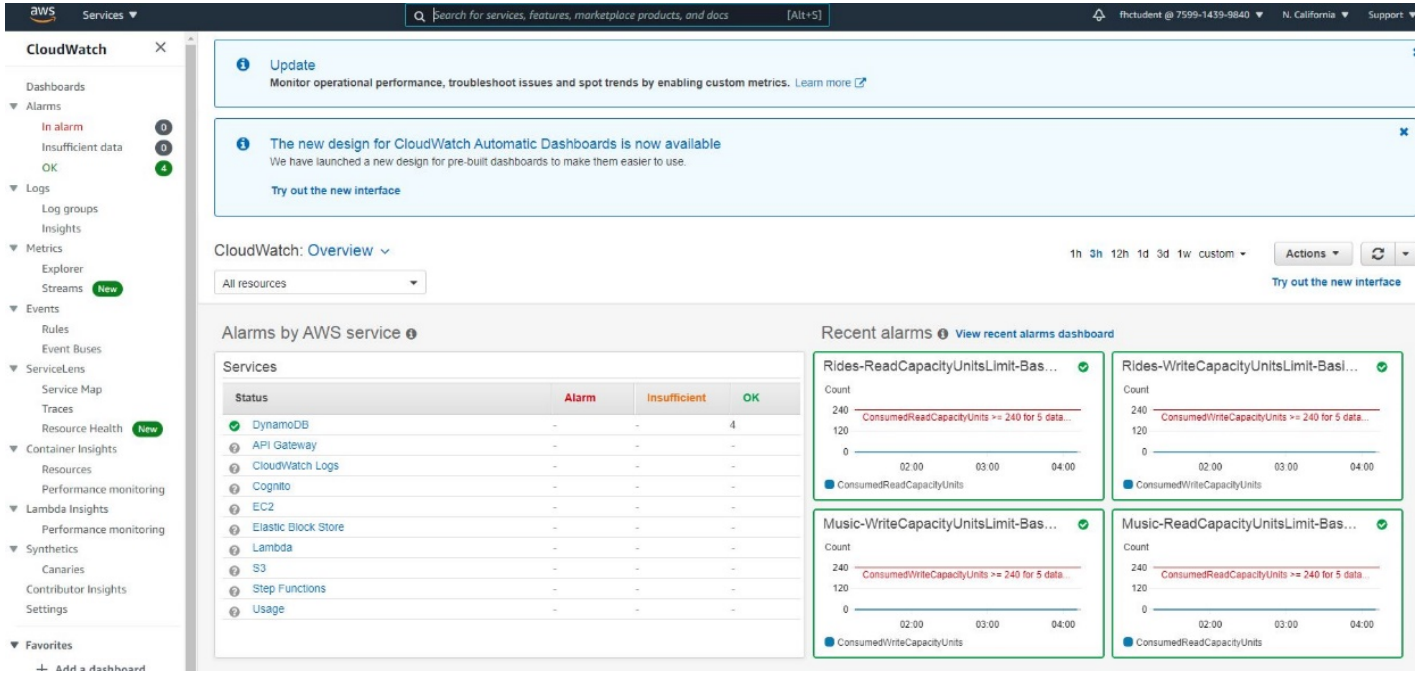
Unicorn arrived map section

- after the request, the notification shows that a unicorn is on the way with its name and color. When the unicorn arrives the notification pump up.

section directions

- click the right up corner of the home page. Users can decide which sections to goes to.

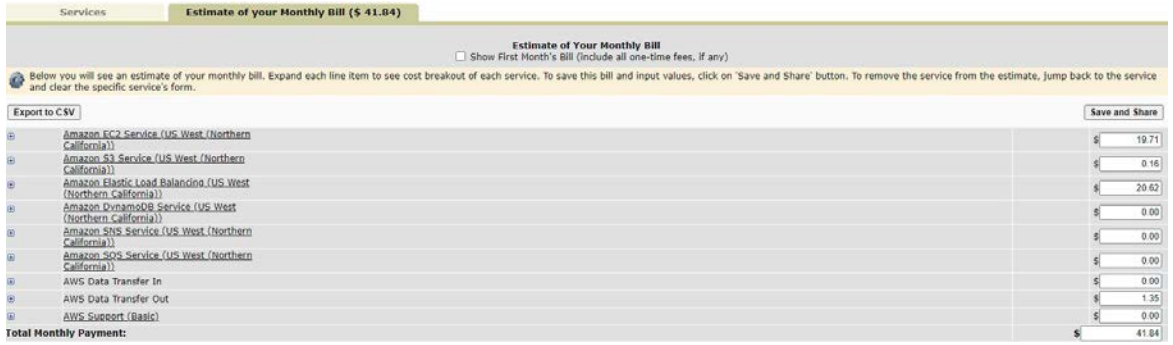
Costs of running the WildRydes platform



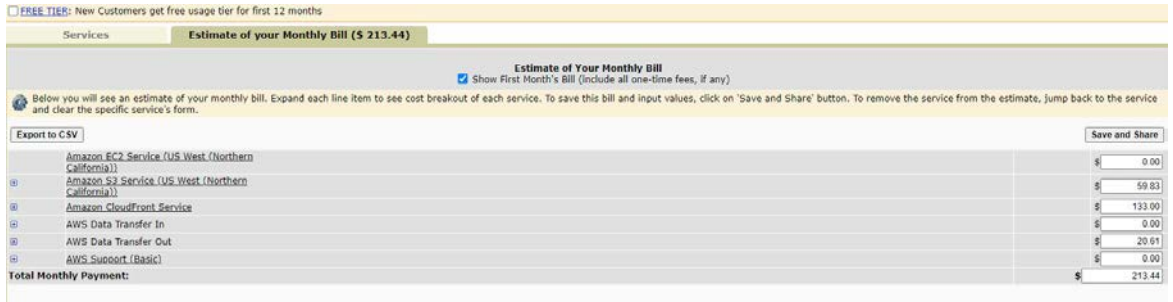
CloudWatch page

We can use Cloud Watch to track the usage. But the cost analysis will based on assumption. Customers will be in N.California area and grow from 1-100 to 1000 to 10000 per second. We don't offer unicorn pool, so one unicorn ride will be requested by one registered user.

Using Simple Monthly Calculator



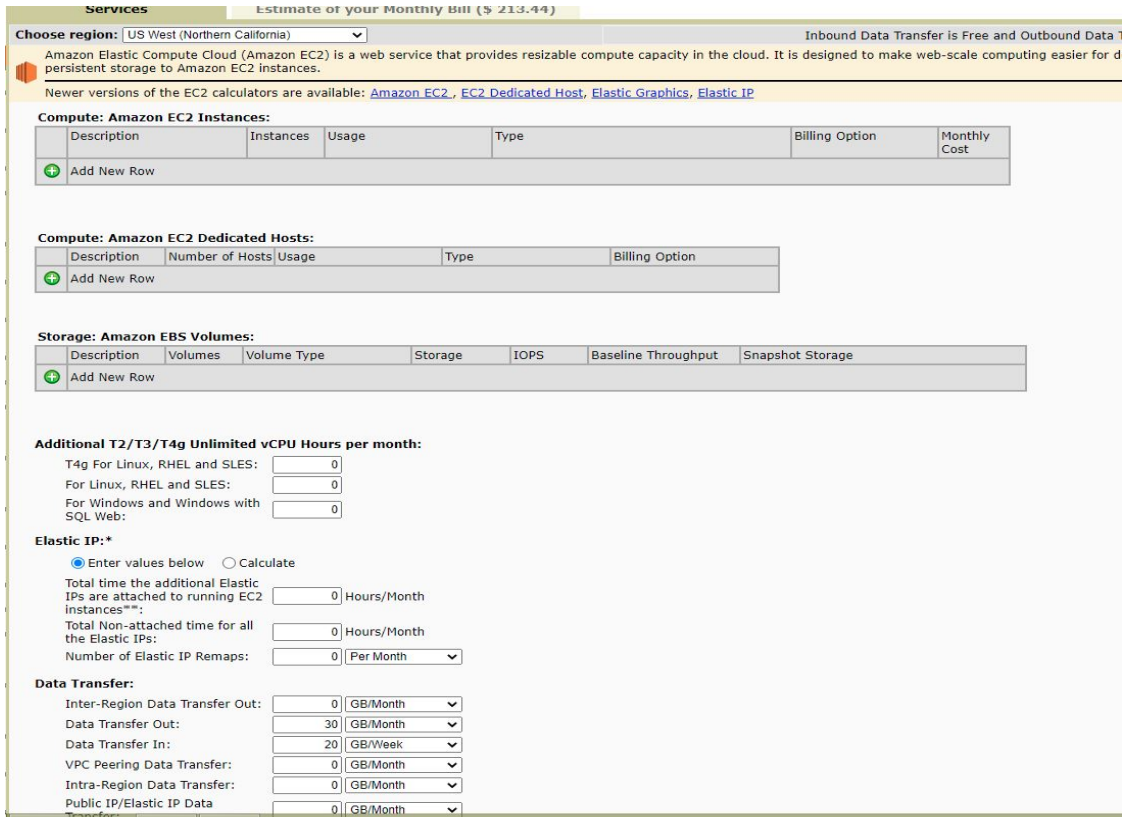
Elastic Bean Stalk usage monthly cost



Marketing Web Site monthly cost

- Later on the company will move to Marketing Web Site with larger data transfer to 30GB. The monthly cost will be $213.44

- WildRydes won't get free tiers so at the very beginning, We will use Elastic Bean Stalk which allows 1 Micro Instance, Running 24 Hours/Day, 15 GB of Data Transfer. Handling "300" requests/moth concurrently. The cost per month is $41.84



Markerting Web site capacity

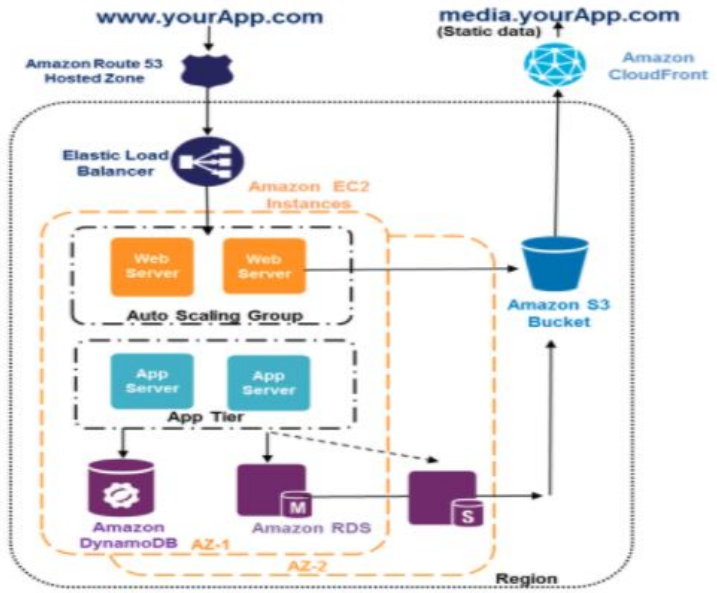
Using Simple Monthly Calculator

With the growth of the customers, platform will move to large web application. This will provide the company 1 Load Balance, 2 Web serves, 2 App Serves, 1 High Availability database server, 30 GB of storage, and 120 BG of data transfer.

The cost per on the will be $1127.18

AWS Solution Calculator

Monthly Costs of Deploying this Solution on AWS: **$ 1095.73**



Name: **3-Tier Auto-scalable Web Application Solution**

Includes:
1 Load Balancer, 2 Web Servers, 2 App Servers, 1 High Availability Database Server, 30 GB of Storage; 120 GB of Data Transfer

Description:
Ruby on Rails application can serve approximately 100,000 pageviews per month

Services | **Estimate of your Monthly Bill ($ 1127.18)**

Estimate of Your Monthly Bill

☐ Show First Month's Bill (include all one-time fees, if any)

Below you will see an estimate of your monthly bill. Expand each line item to see cost breakout of each service. To save this bill and input values, click on 'Save and Share' button. To remove the service from the estimate, jump back to the service and clear the specific service's form.

Export to CSV | Save and Share

Amazon EC2 Service (US West (Northern California))	$ 645.58
Amazon S3 Service (US West (Northern California))	$ 0.89
Amazon Route 53 Service	$ 0.90
Amazon CloudFront Service	$ 34.16
Amazon RDS Service (US West (Northern California))	$ 291.00
Amazon Elastic Load Balancing (US West (Northern California))	$ 22.22
Amazon DynamoDB Service (US West (Northern California))	$ 90.22
AWS Data Transfer In	$ 0.00
AWS Data Transfer Out	$ 42.21
AWS Support (Basic)	$ 0.00
Total Monthly Payment:	$ 1127.18

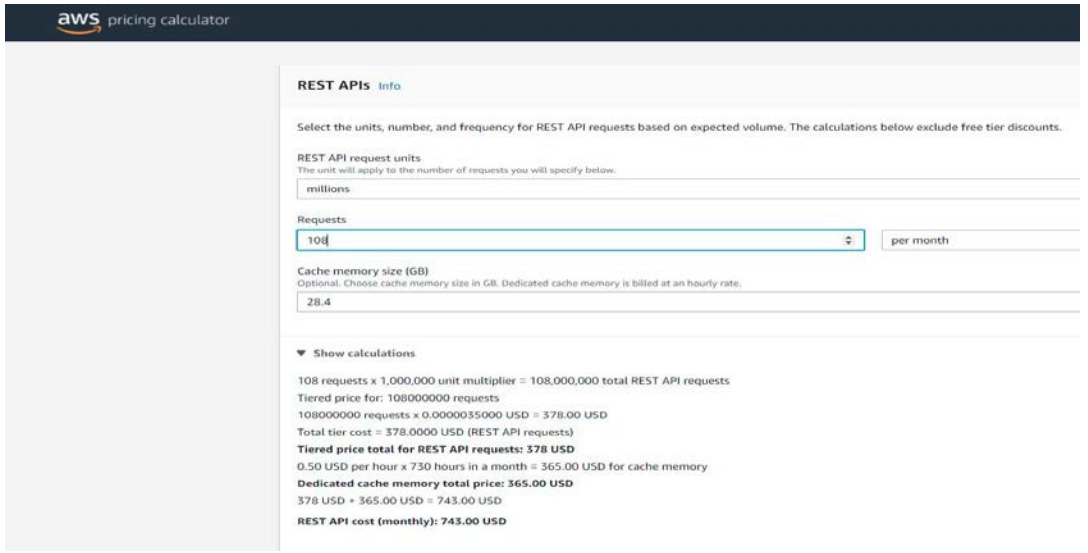
Common Customer Samples

- Free Website on AWS
- AWS Elastic Beanstalk Default
- Marketing Web Site
- Large Web Application (All On-Demand)
- Media Application
- European Web Application
- Disaster Recovery and Backup

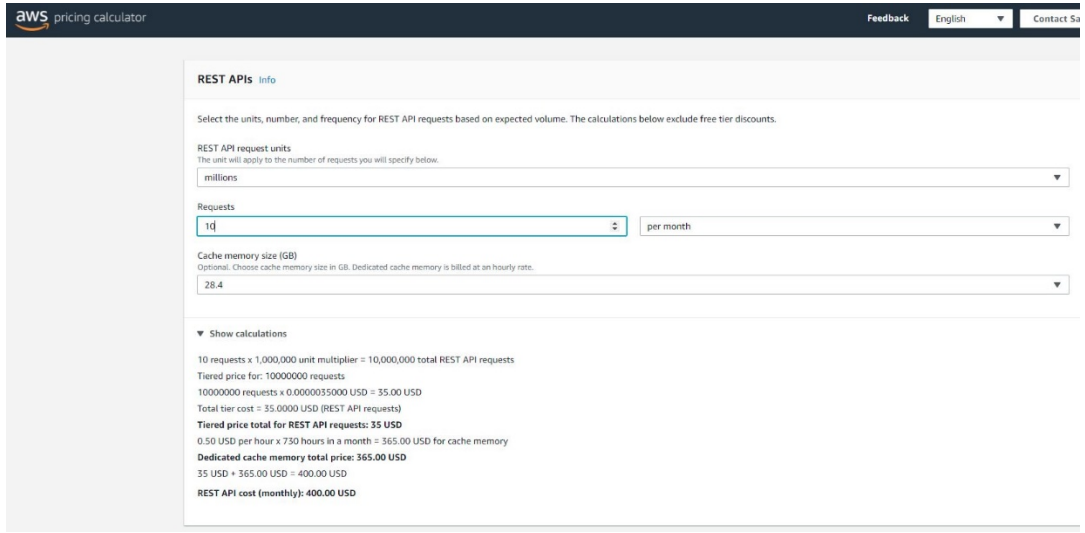
large Web Application monthly cost

AWS pricing calculator- REST APIs

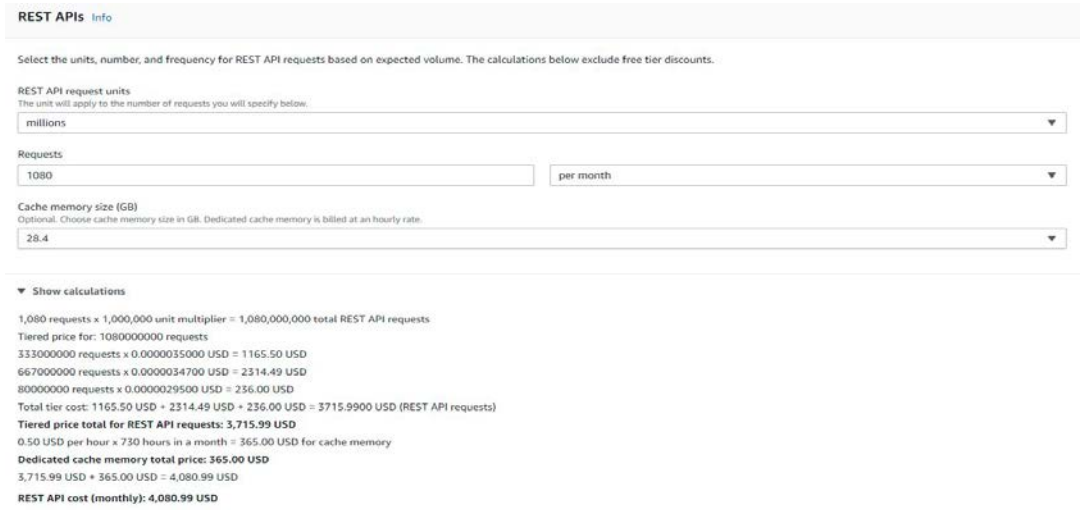
Using AWS pricing calculator, we can estimate the cost of REST APIs per month. When the data is under 100 request/s the monthly cost will be around 400 USD. As the request amount goes up to 1000/s the cost goes up to 745 USD. For a 10000 request/s usage the monthly cost is 4080.99 USD.



Up to 1000 request/s monthly cost



1-100 request/s monthly cost



Up to 10000 request/s monthly cost