SERVERLESS WEB APPLICATION

OUTLINE:

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud, offering over 200 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

this is a super simple application but it ties together all of the main components that you would need to build a much larger real world application. the services used here are

1.amplify,

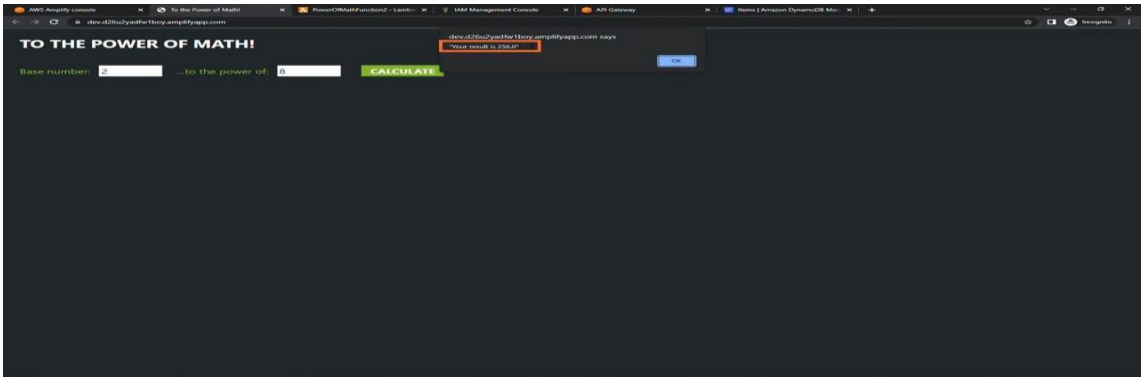
2.lambda,

3.API Gateway,

4.dynamoDB,

5.Aws IAM.

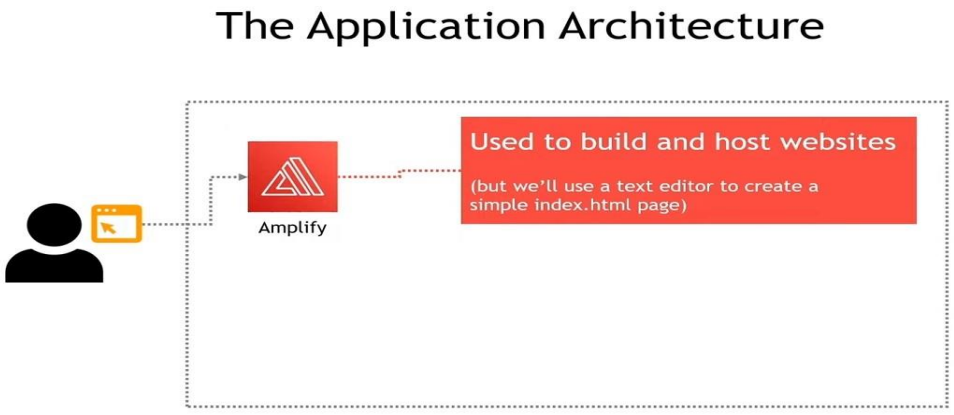
This just takes into different numbers so we have a base number let's say 2 and then an exponent we'll go with 8 and it's going to return the result the base to the power of the exponent If we click on calculate the result is 256.0



you'll see that in the pop-up it's also being saved to a dynamo DB table on the back end if you wanted to do something with it down the line all right now you've seen that very exciting application that we're working towards let's walk through how we got there what do we need to do to make this happen well

AMPLIFY:

first we need a way to create and host a web page how would we implement that in the land of AWS as most things anybody else there's actually several ways you could do this so when we're gonna choose just because it's super easy it's called amplify.

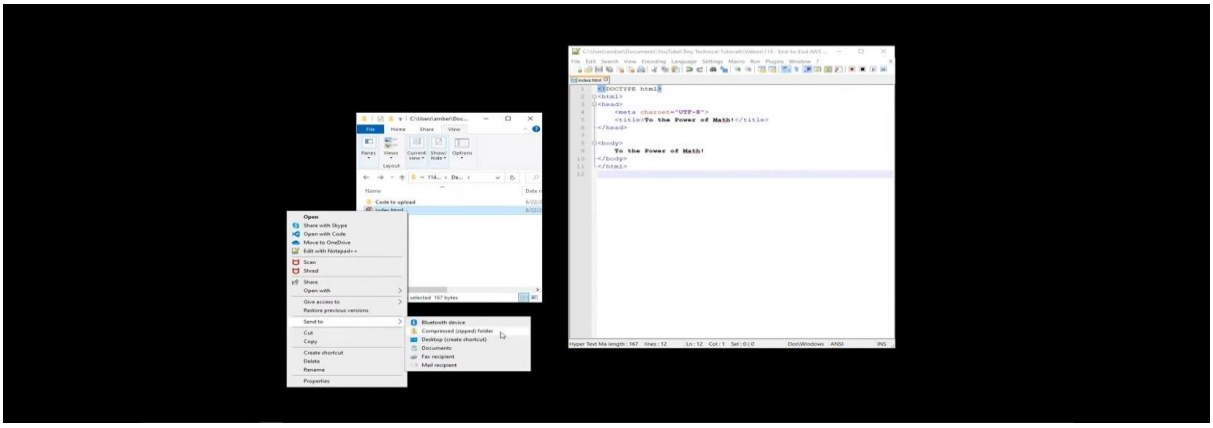


---

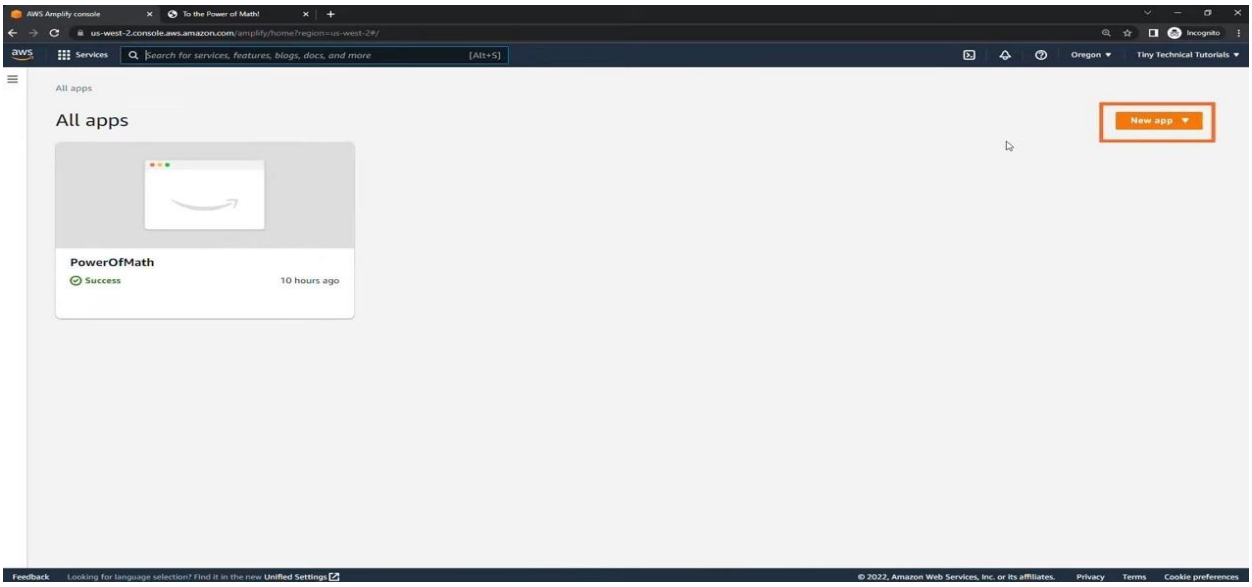
with amplify you can build and host websites and it's a great service particularly if your front end developer but for our purposes since our page will be so simple.

We are actually just gonna go create an HTML page in my text editor on my local machine and then we're only gonna use amplified to deploy and host that web page so let's go do that now so here my local machine I'm just gonna create a new I'll start with the text file it'll call this index.html.

you can get rid of the text yes we want to change this I want HTML file or if you have a preferred way to create a new HTML file you can go ahead and do that but let's open this one up I'm going to use notepad plus plus over here and I'll just paste in some really simple code

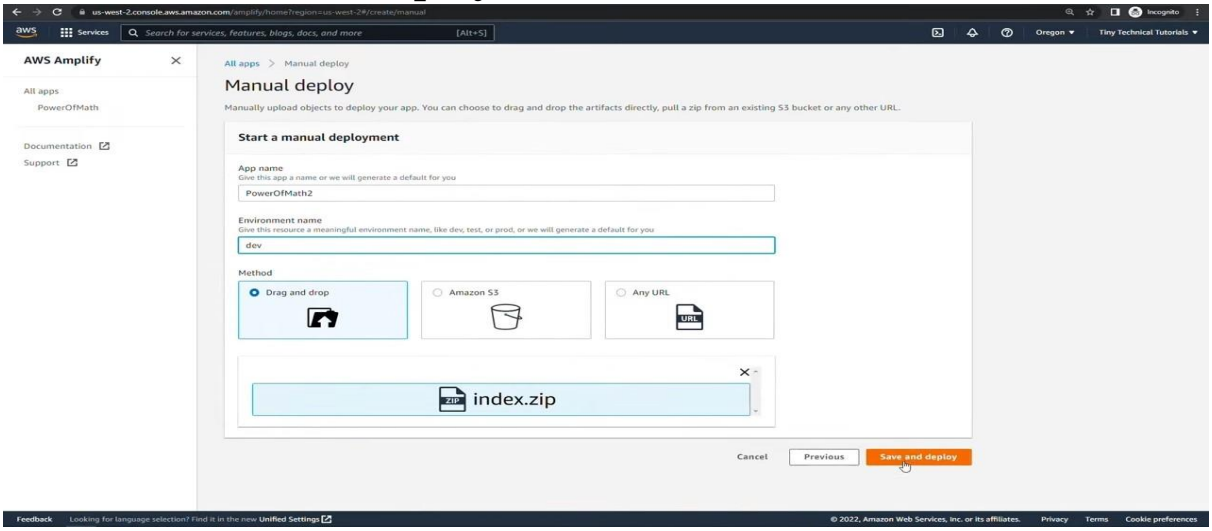


basically just going to display to the name of our application now all of this code incidentally this one will be called index original we are going to update this later save the file and now we need to do is zip it up so zip up just the index.html file in my case that will be sent to compressed folder navigate to amplify so I'll create a new app .

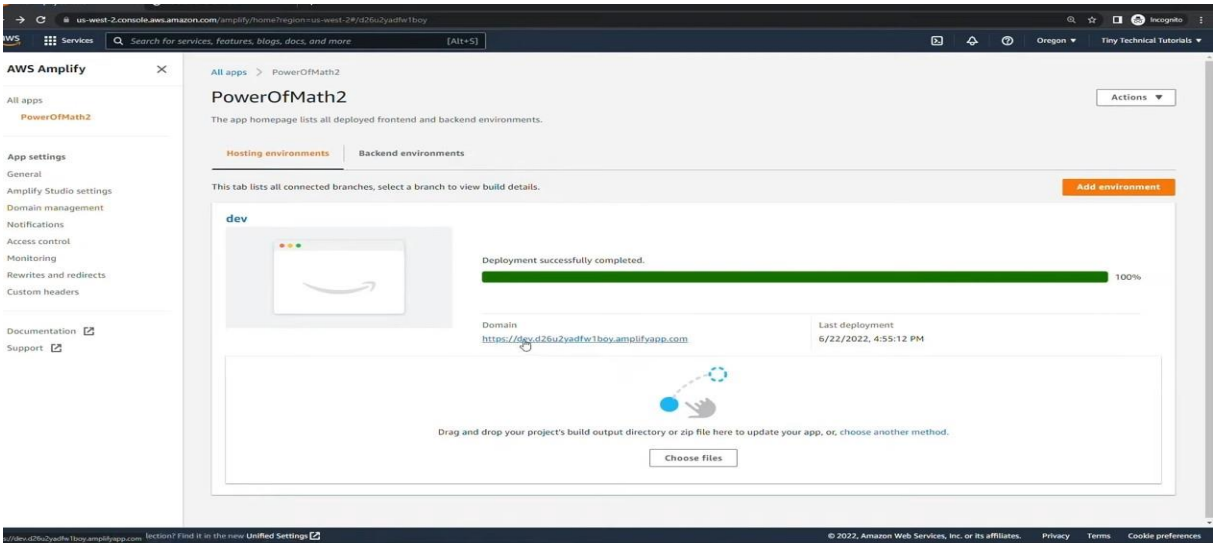


Here we just want to host the web app we don't have a get provider so you can select this option right here and continue give the name I'm going to call my power of math too since I already have an original one the environment name I'm going to use dev and I want to drag and drop so here's where

you grab that zip file that we created a minute ago just drag that over safe and deploy.

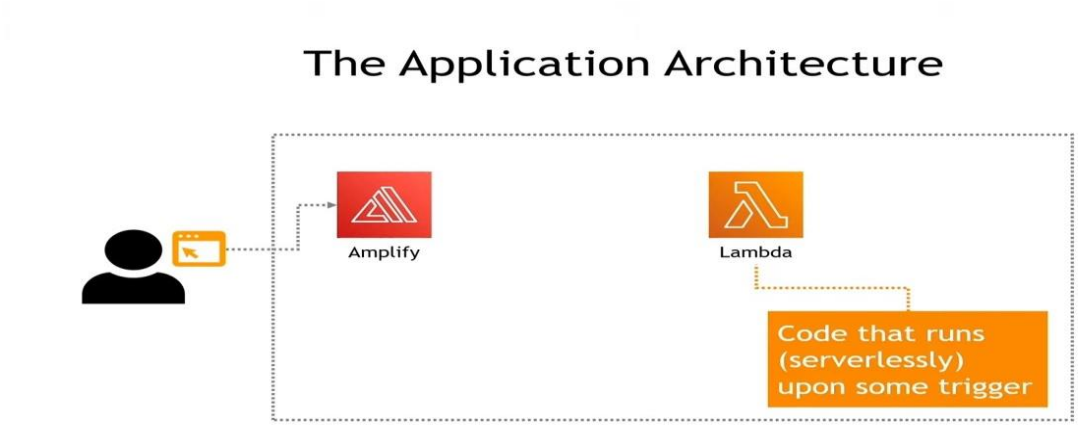


there which you'll see deployment is successful and here is your link you can also get to this anytime by coming over to domain management and you can access those links as well



LAMBDA:

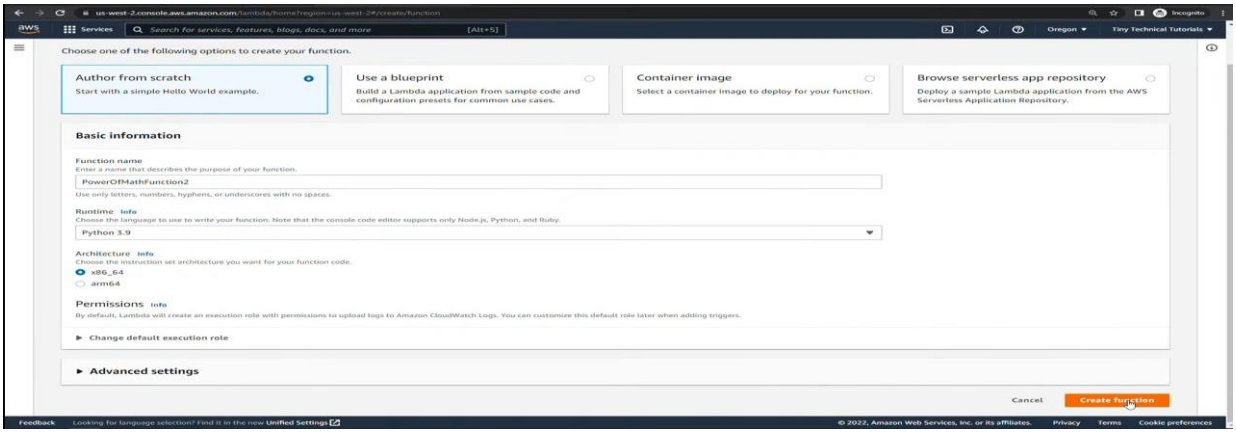
all right so here we are gonna work on a to do some math to do this we're gonna use a lambda function



---

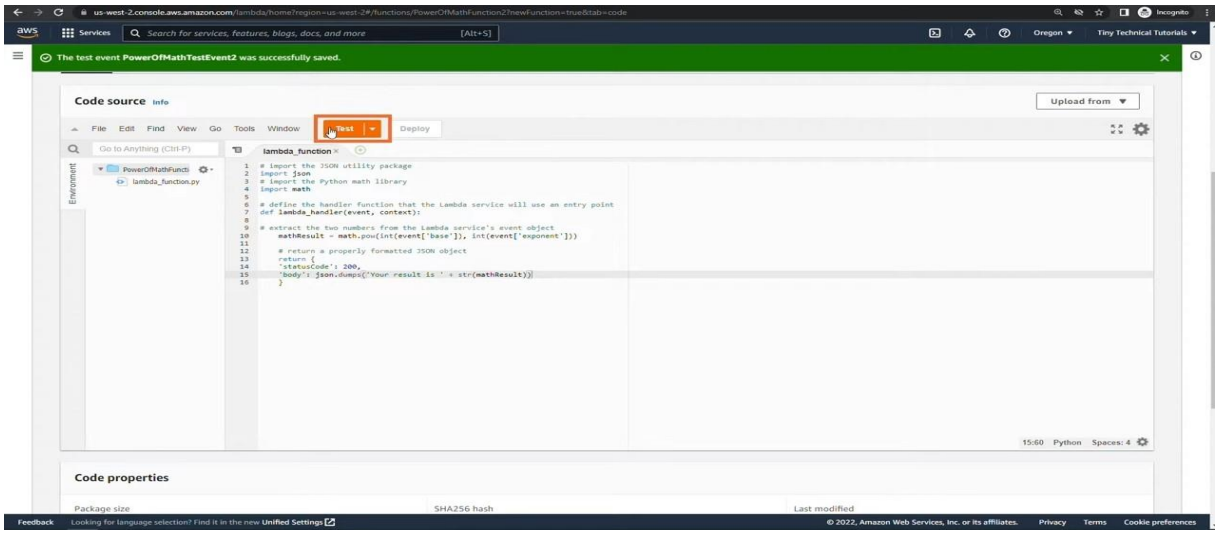
it's just code or functions really sitting out there that get run when you need them and these are serverless meaning that you don't have to set up and manage servers to run the code just happens automatically behind the scenes for you.

So we'll write some Python code and use the Python math library to do the calculations that we need. let's go with the latest version of Python 3.9 you can leave everything else the same and create function.



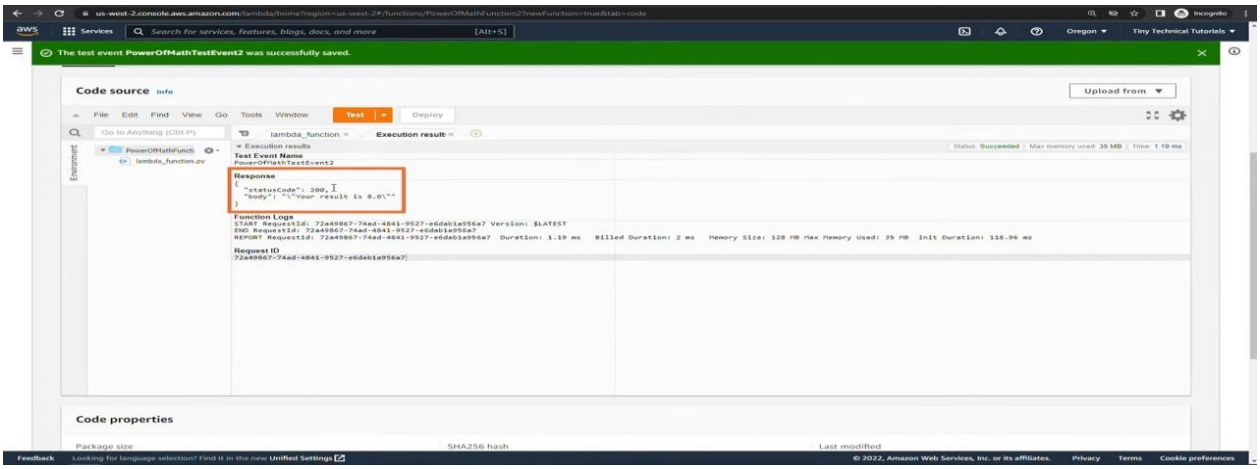
this code need to update To keep them a separate but let me just grab this and then I'll walk you through it real quickly you can replace everything here so pretty simple code or just importing the JSON utility package and the Python math library so we can do our calculation then you've got your lambda handler . Two numbers the base number and then the exponent we're graphing those out of the event object that we'll get and then plug them into this math dot how for power which is going to give us the result

Then we'll return that result in the JSON object and now let's test.



let's go set up a test we only have two values to pass in one of them is going to be base and what is going to be exponent and you can choose whatever values you want here I'm going to do two to the power of three which should give eight actually run the test which you can do here by the orange test button and

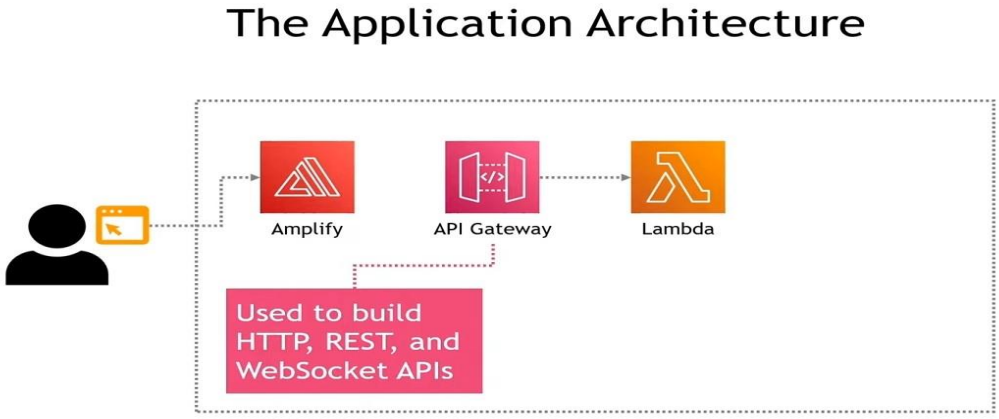
we're status code of 200 and the result is “8”.

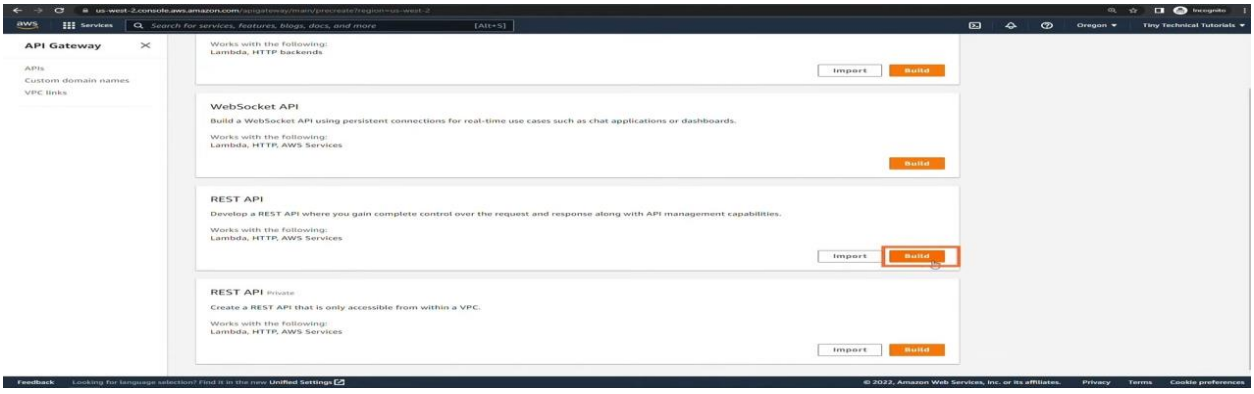


so I'm a function is working all right this is what we have so far just the simple HTML page hosted and amplify and a lambda function to do some basic math.

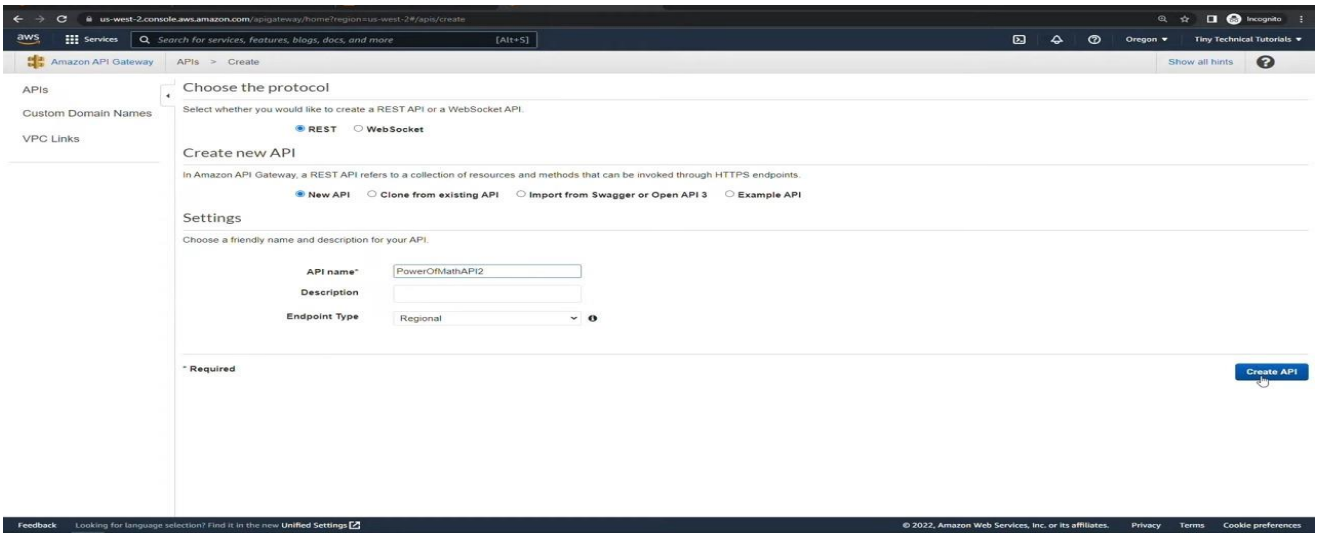
API GATEWAY:

This is a core service and AWS that you can use to build your own APIs application programming interfaces whether those are HTTP REST . website APIs and it's really the perfect way to invoke a lambda function So let's go do that all right back here in the browser I'm also gonna open a new tab for this just so we can keep all the services up and visible easily and for this one we're gonna navigate to API gateway

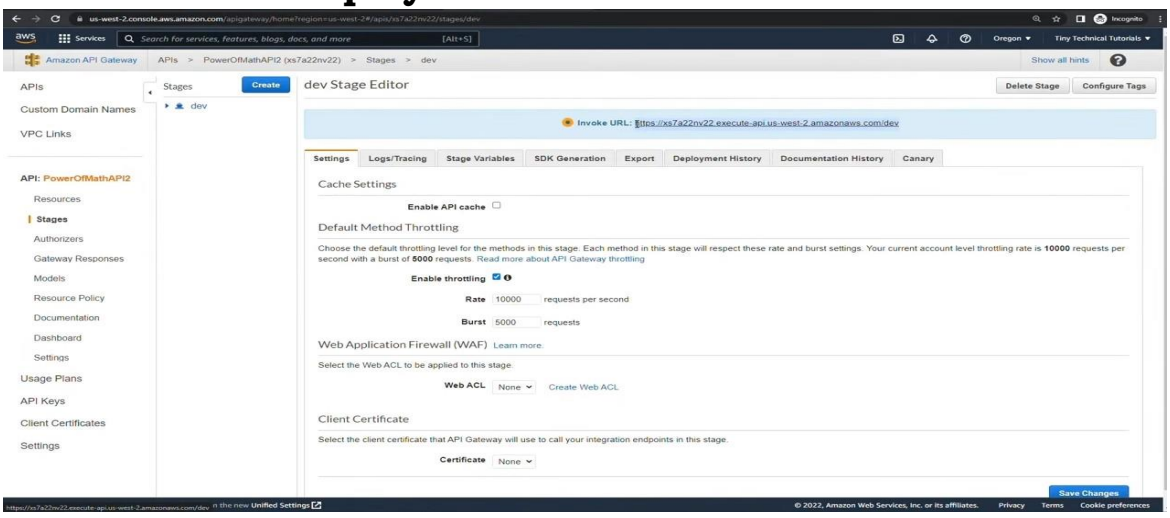




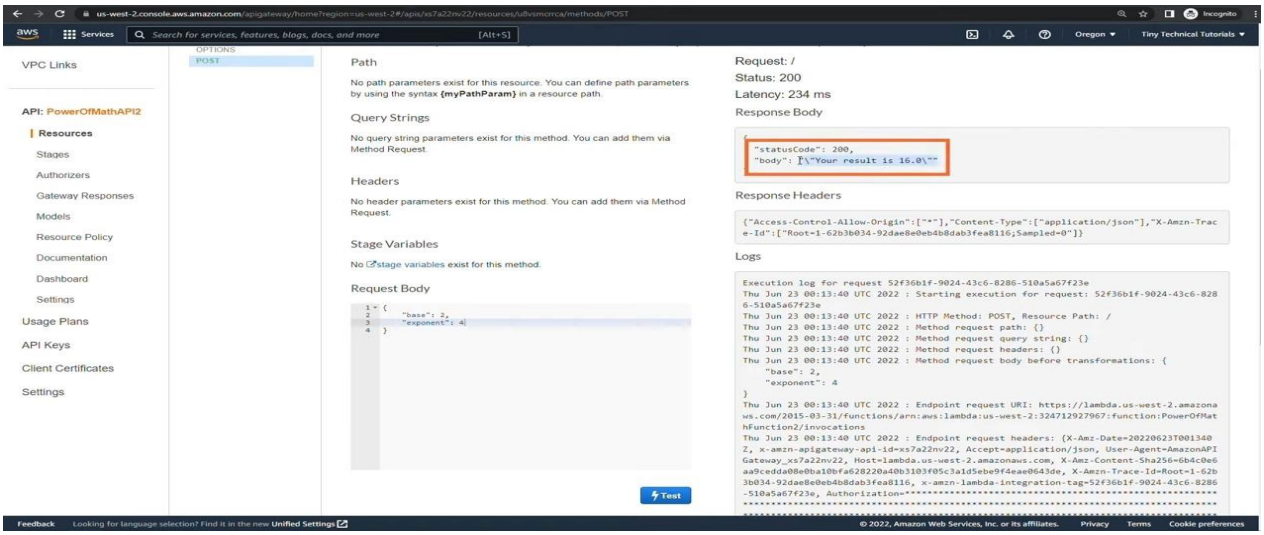
Once again this is my original API Let's create a new one by clicking on the create API button



hwe're going to be using REST API Now let's deploy the API so we can test it out so here again on the actions menu let's deploy API on set up a new stage here you might have different stages for dev tasked production and so on this one will call dev and deploy this URL



this'll API gateway URL will be used further.click on the blue lightning and bolt here givee 2and then the code number maybe we want to try with say 4 now let's test and the result "16"



everything worked yay progress now we can trigger our math function in lambda with an API call we still haven't hooked that up to our index at HTML page and amplify yet but don't worry we'll get there next though.

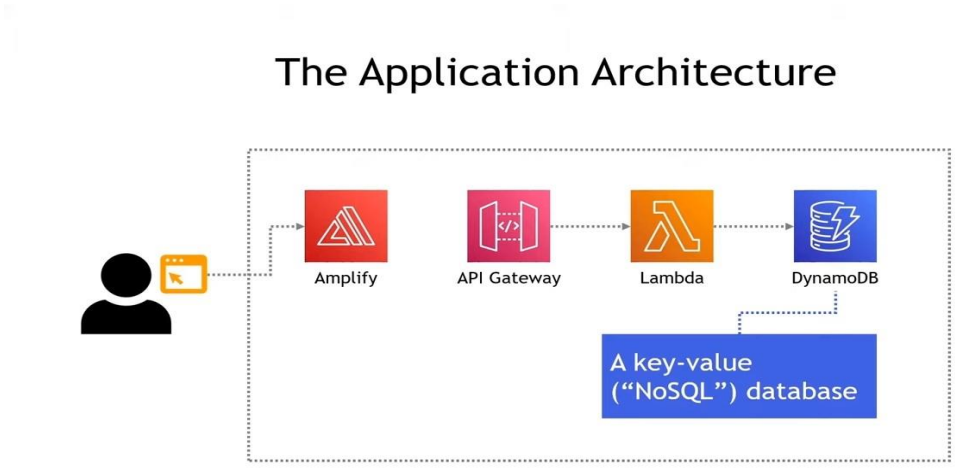
An API gateway is an API management tool that sits between a client and a collection of backend services. An API gateway acts as a reverse proxy to accept all application programming interface (API) calls, aggregate the various services result.

An API gateway is one part of an API management system. The API gateway intercepts all incoming requests and sends them through the API management system, which handles a variety of necessary functions.

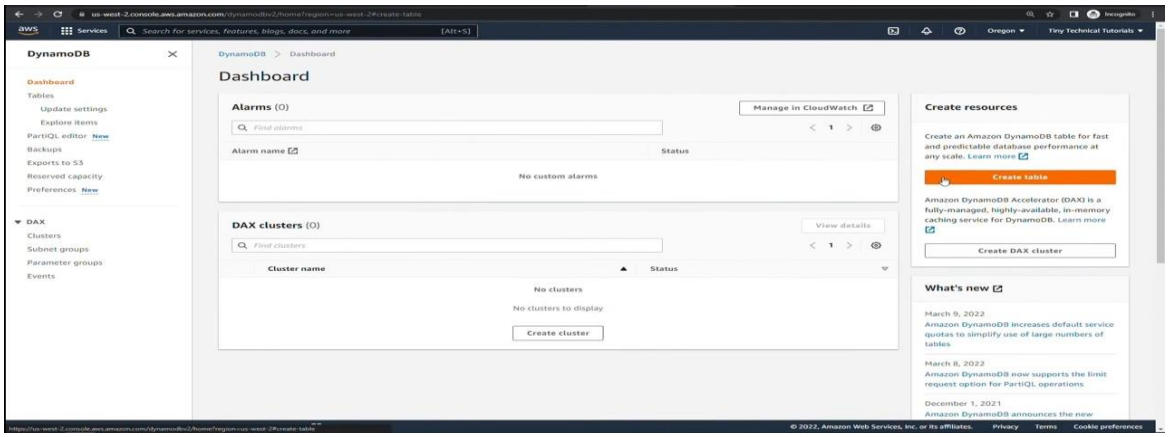
Exactly what the API gateway does will vary from one implementation to another. Some common functions include authentication, routing, rate limiting, billing, monitoring, analytics, policies, alerts, and security.

DynamoDB:

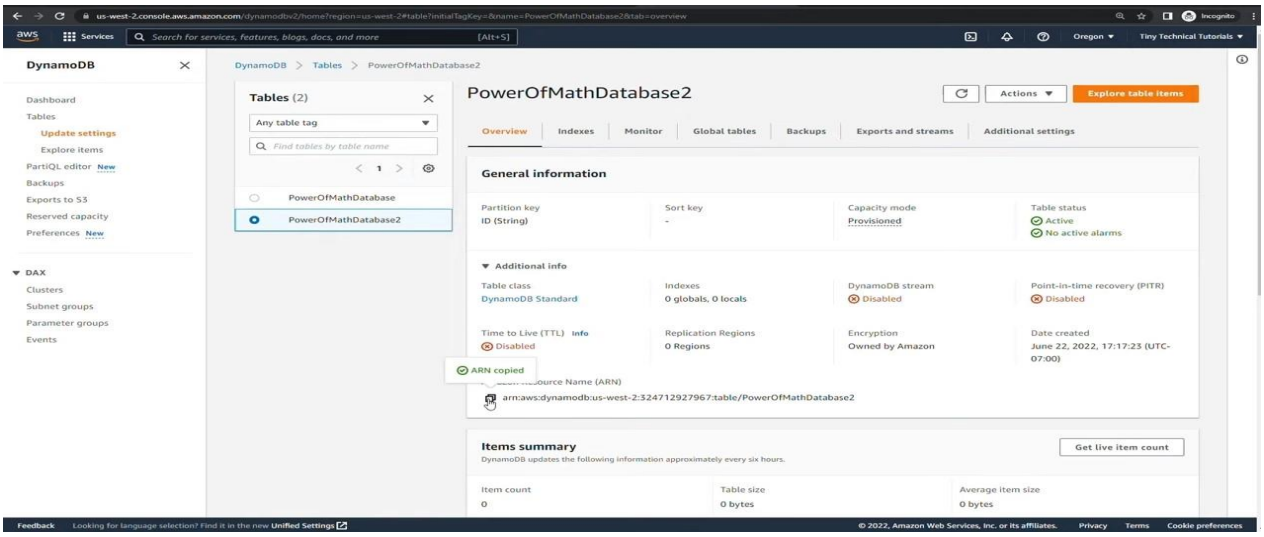
the most real-world apps these days have databases we're also going to need to handle permissions between the different parts of the application starting with the database for our purposes we're going to be using DynamoDB



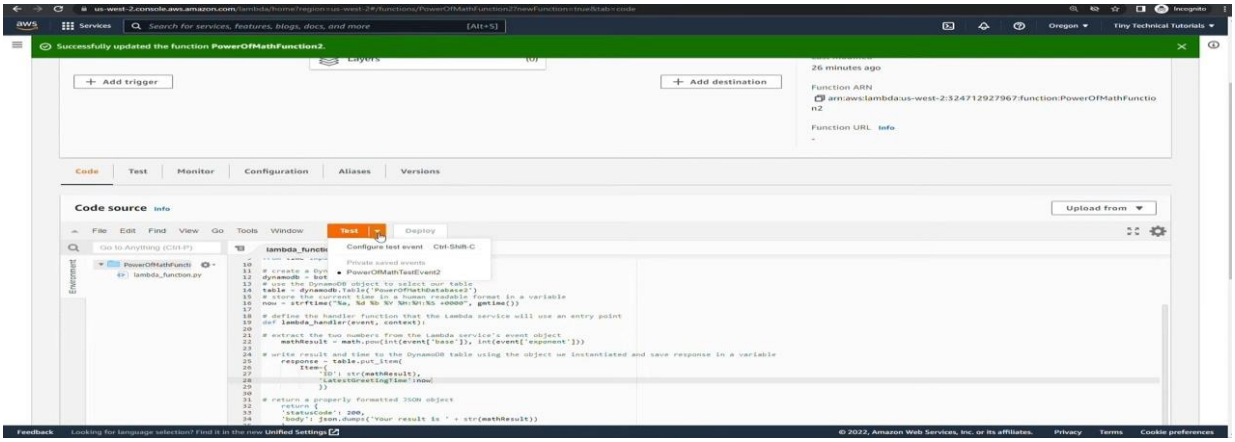
this is a key value or no sequel database it's going to be lighter weight than something like a relational database where you have to go set up your schema your relationships and then I'm interested as well specifically we're going to need to give our lambda function permission to write to the database open a new tab so we can keep this one dedicated to dynamo DB and here we want to create-table.



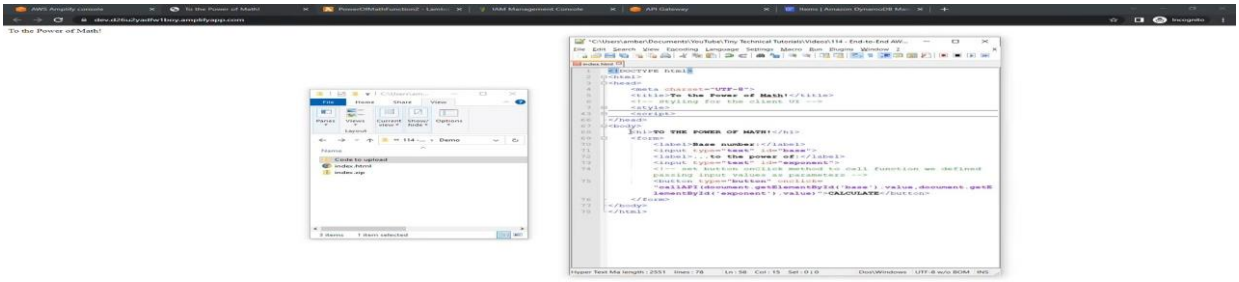
For table name I'll do power of math database 2 for partition key will say ID you can leave everything else the same and create table okay now we do need to save the Amazon resource name or the ARN for this.



click into that table and grab this ARN right here andwe'll come back and get that later Alright to that permissions discussion This has to do with our lambda function having permissions to write to this table we're getting our Bode3 resource for DynamoDB put item and then we're deploy our changes and then let's test

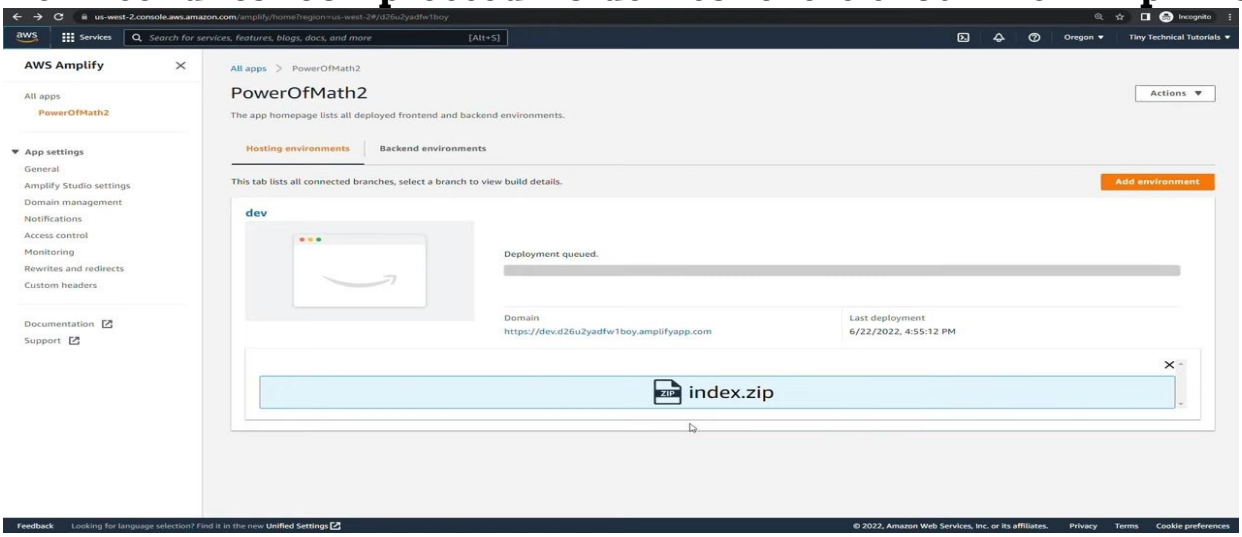


this final piece for this part need to update the index.html page just paste in the final code here.it'll just be the index on HTML the original was just a simple one



we're passing in the base and the exponent those two numbers and call APIs defined right up here .

created a dev stage save this I'll close out of that close out of that and then we need to make a zip file out of this again so delete original zip file and then this is the updated index.html we'll send to compressed folder so there's our new zip file



they're gonna need to go redeploy it using amplify.

deployment is cute and success so should be the same domain here you can open it again or just come back to the one we had opened from earlier and I'll do a refresh so this is our original one let's see what we have now and today some style all right so let's walk through

RESULT:

enter the numbers let's just say 2 to the power of 5 for something different when we click this calculate button that

script here on our HTML page is will call API gateway that's then trigger the lambda function which does the calculation that gets written to the database and then we'll get a message return to us in the browser through API gateway so here we go calculate and the result is "32" all right that's completed application