

Final Presentation

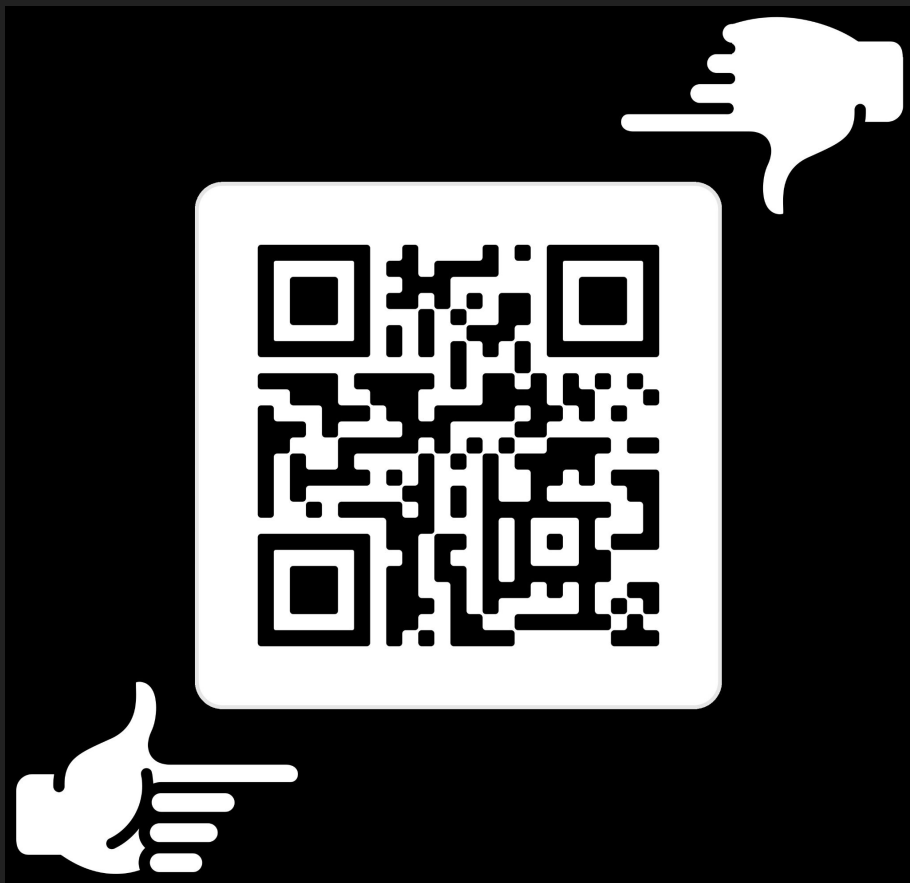
CSCD 396- Azure

Fall Quarter 2023
By Beighlor Martinez

Github: <https://github.com/bludbandit95/CSCD396Final>

Website: <https://theodoodle.azurewebsites.net>

Website



Github Repo



Summary

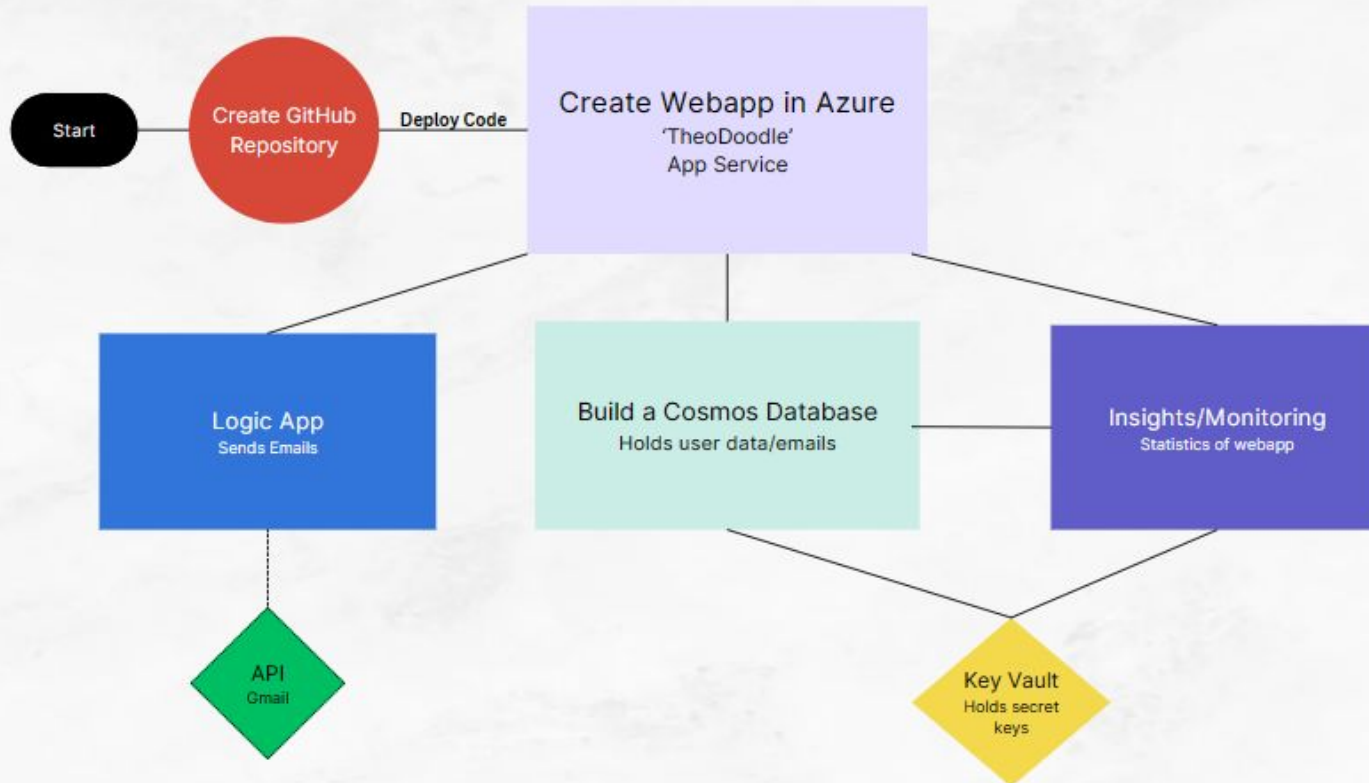
- For this project I tried to do everything through the Azure portal.
- I created a simple web application that allows a user to enter in their email.
- Once the email is entered it gets saved into the cosmos database
- Simultaneously this triggers the logic app to send the user an automated email with a welcome message.

Services used:

- App Services (Create a website)
- Cosmos Database (stores user data)
- Application Insights/Monitoring
- Key Vault (stores secret keys)
- Logic App (sends email)

TheoDoodle

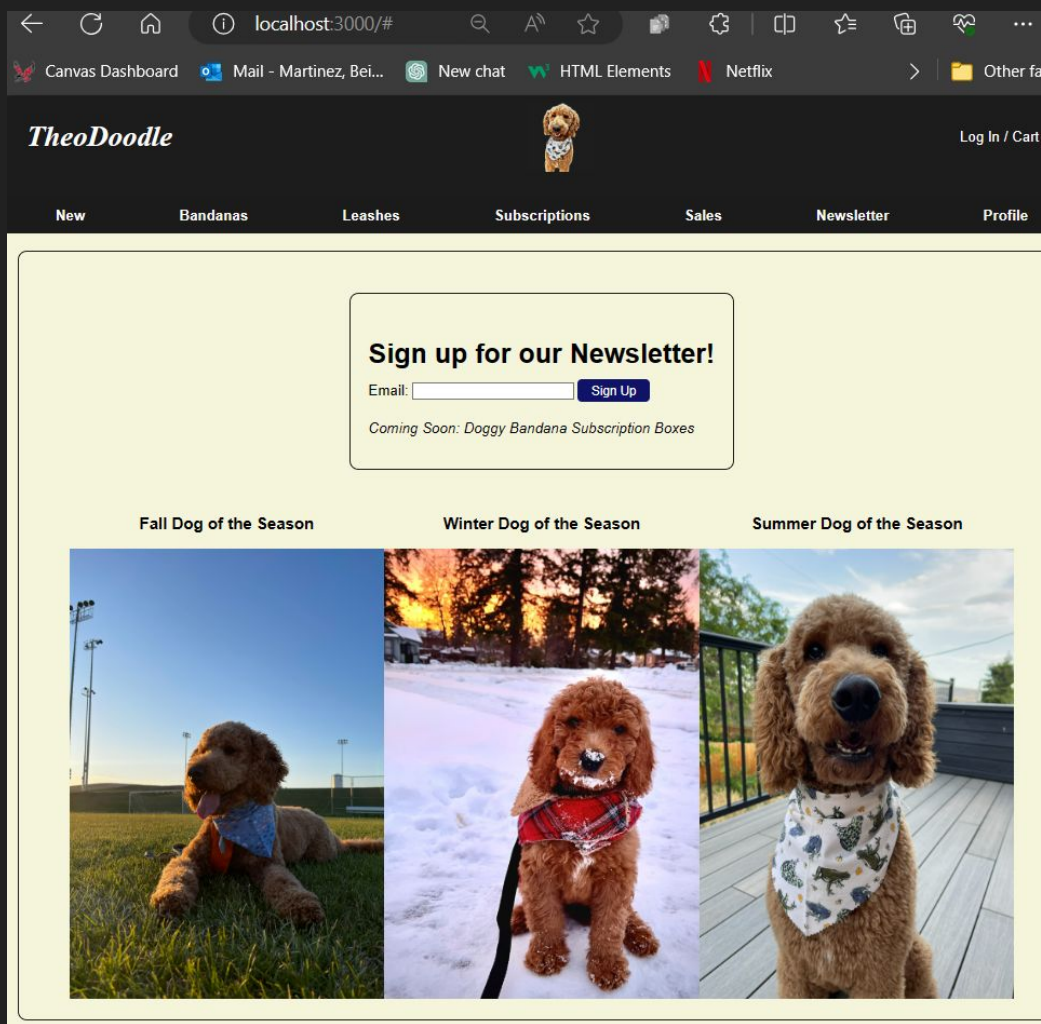
Diagram for Azure Project



- ★ Github deploys code to web-app
- ★ Web-app is connected to logic app, cosmos db, and insights
- ★ Key-vault stores secrets for insights and cosmos
- ★ Insights is connected to monitor cosmos and webapp
- ★ Logic App is connected to API and web app

Here is the website

- Designed using javascript and html
- Used a local host to test everything and ran through node.js
- If it worked locally I would push it through my github repo which deployed it to my azure app.



Step 1: Create a Resource Group

Home > Resource groups >

Create a resource group

✓ Validation passed.

Basics Tags Review + create

Basics

Subscription	EWU Sub
Resource group	TheoDoodle
Region	East US

Tags

None

- Step #1, Create a resource group to hold everything.


Step 2: Create a Web App

- Name = TheoDoodle
- Publish = code
- Runtime stack = node 20 LTS for javascript
- SKU = Free so they don't charge me
- OS = linux

Home > App Services > Create Web App ...

Basics Database **Deployment** Networking Monitoring Tags Review + create

Summary

 **Web App**
by Microsoft

Free sku
Estimated price - Free

Details

Subscription	b0f79418-7a87-4e01-9498-741b460d9f11
Resource Group	TheoDoodle
Name	TheoDoodle
Publish	Code
Runtime stack	Node 20 LTS

App Service Plan (New)

Name	ASP-TheoDoodle-9492
Operating System	Linux
Region	East US
SKU	Free
ACU	Shared infrastructure
Memory	1 GB memory

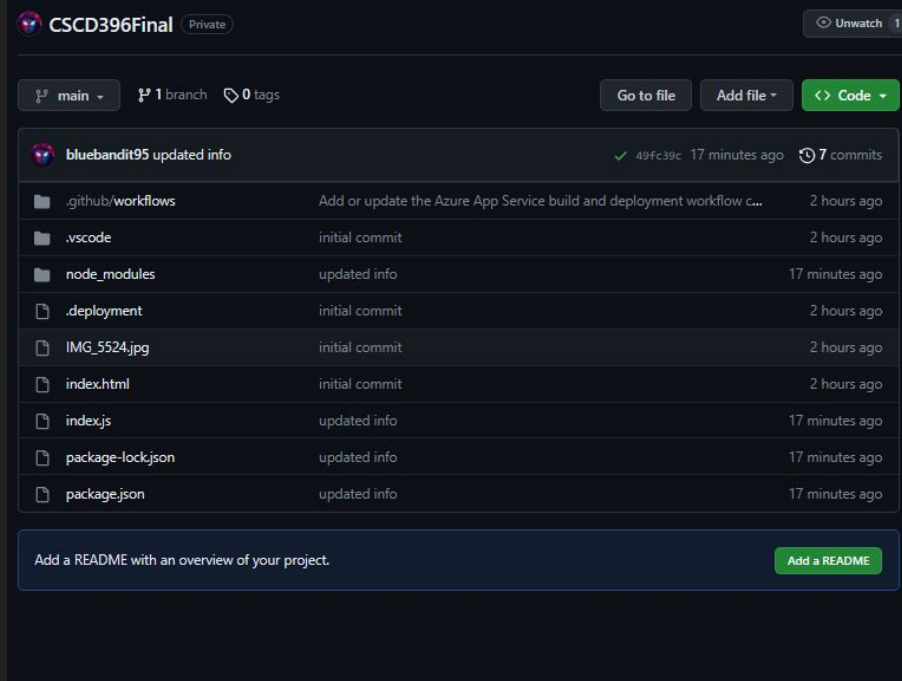
Monitoring

Application Insights	Not enabled
----------------------	-------------

Deployment

Continuous deployment	Not enabled / Set up after app creation
-----------------------	---

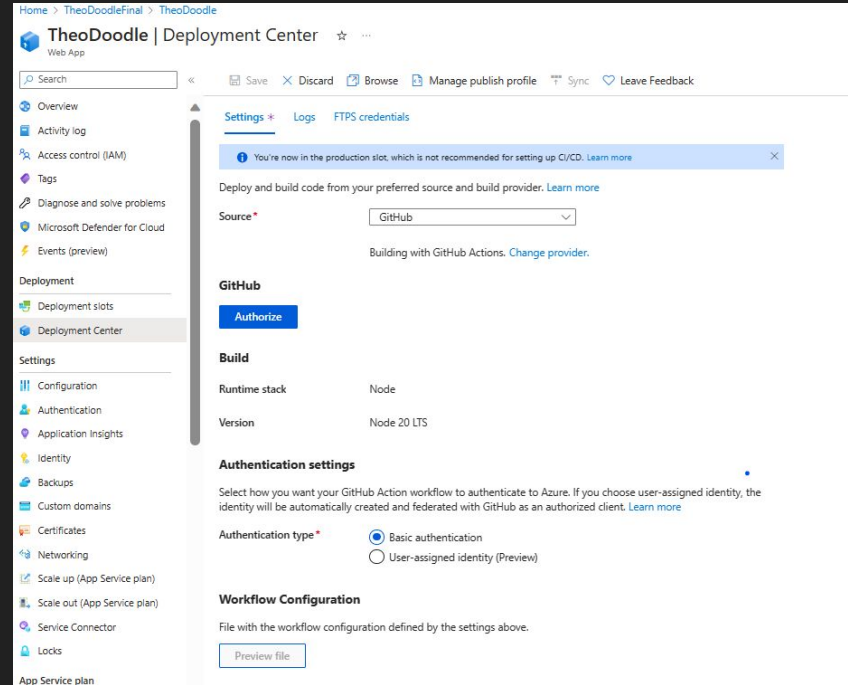
Step 2a: Deploy Code Using Github



The screenshot shows a GitHub repository named 'CSCD396Final' (Private). The repository has 1 branch (main) and 0 tags. The commit history shows a recent update by 'bluebandit95' 17 minutes ago, with 7 commits. The file list includes:

File	Commit	Time
.github/workflows	Add or update the Azure App Service build and deployment workflow c...	2 hours ago
.vscode	initial commit	2 hours ago
node_modules	updated info	17 minutes ago
.deployment	initial commit	2 hours ago
IMG_5524.jpg	initial commit	2 hours ago
index.html	initial commit	2 hours ago
index.js	updated info	17 minutes ago
package-lock.json	updated info	17 minutes ago
package.json	updated info	17 minutes ago

At the bottom, there is a button to 'Add a README with an overview of your project.'



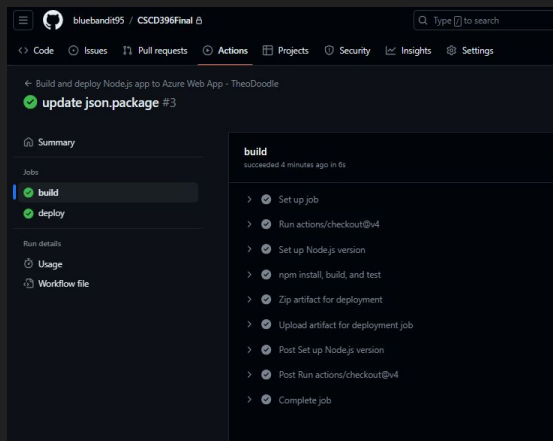
The screenshot shows the 'TheoDoodle | Deployment Center' settings page. The page is for a 'Web App' and includes a sidebar with navigation options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Deployment, Deployment slots, Deployment Center, Settings, Configuration, Authentication, Application Insights, Identity, Backups, Custom domains, Certificates, Networking, Scale up (App Service plan), Scale out (App Service plan), Service Connector, and Locks.

The main content area shows the 'Settings' tab, which includes a warning: 'You're now in the production slot, which is not recommended for setting up CI/CD. Learn more'. Below this, the 'Source' is set to 'GitHub', and the 'Build' section shows 'Runtime stack' as 'Node' and 'Version' as 'Node 20 LTS'.

The 'Authentication settings' section includes a note: 'Select how you want your GitHub Action workflow to authenticate to Azure. If you choose user-assigned identity, the identity will be automatically created and federated with GitHub as an authorized client. Learn more'. The 'Authentication type' is set to 'Basic authentication'.

The 'Workflow Configuration' section includes a button to 'Preview file'.

Step 2b: Check if everything is working properly



bluebandit95 / CSCD396Final

Build and deploy Node.js app to Azure Web App - TheDoodle

update json.package #3

Summary

Jobs

- build
- deploy

Run details

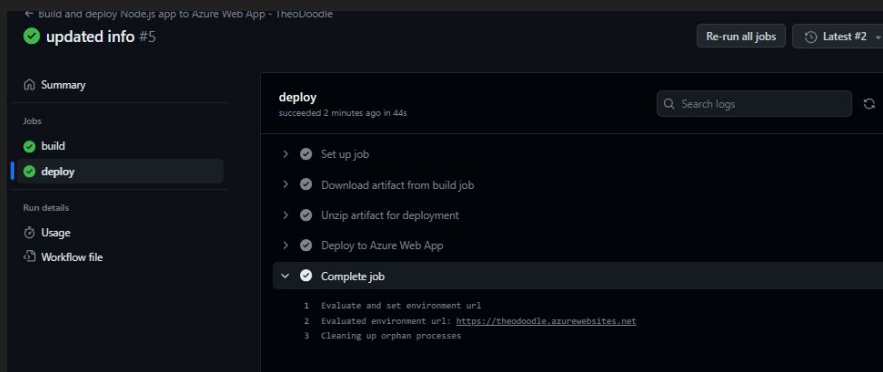
Usage

Workflow file

build

succeeded 4 minutes ago in 11s

- Set up job
- Run actions/checkout@v4
- Set up Node.js version
- npm install, build, and test
- Zip artifact for deployment
- Upload artifact for deployment job
- Post Set up Node.js version
- Post Run actions/checkout@v4
- Complete job



Build and deploy Node.js app to Azure Web App - TheDoodle

updated info #5

Re-run all jobs

Latest #2

Summary

Jobs

- build
- deploy

Run details

Usage

Workflow file

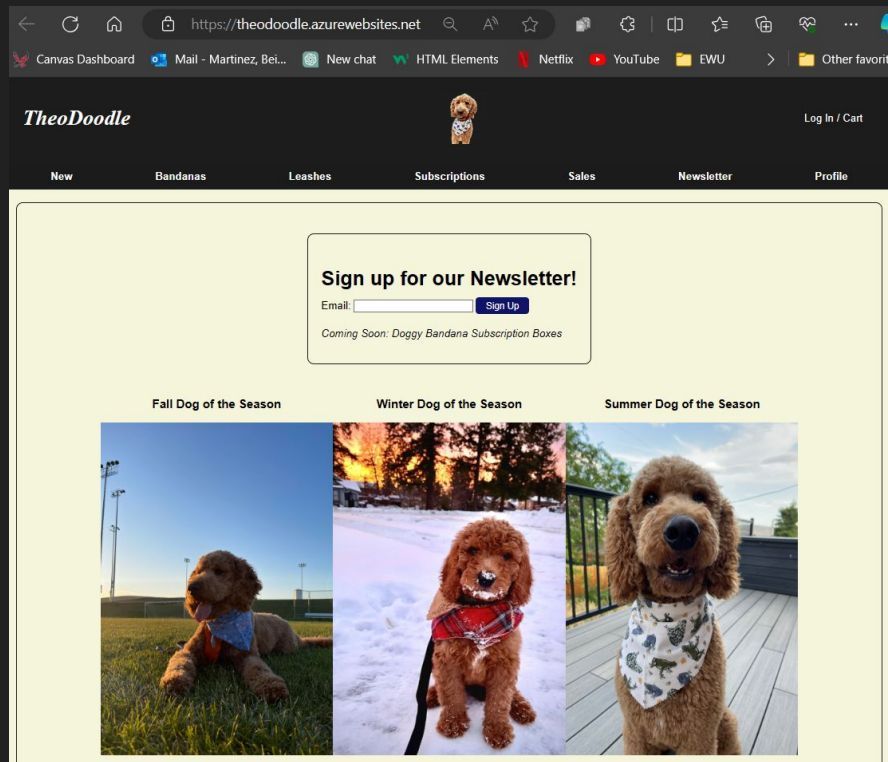
deploy

succeeded 2 minutes ago in 44s

Search logs

- Set up job
- Download artifact from build job
- Unzip artifact for deployment
- Deploy to Azure Web App
- Complete job

- Evaluate and set environment url
- Evaluated environment url: <https://thedoodle.azurewebsites.net>
- Cleaning up orphan processes



https://thedoodle.azurewebsites.net

Canvas Dashboard Mail - Martinez, Bei... New chat HTML Elements Netflix YouTube EWU Other favorite

TheDoodle

Log In / Cart

New Bandanas Leashes Subscriptions Sales Newsletter Profile

Sign up for our Newsletter!

Email: Sign Up

Coming Soon: Doggy Bandana Subscription Boxes

Fall Dog of the Season Winter Dog of the Season Summer Dog of the Season

Fall Dog of the Season: A brown dog wearing a blue bandana, sitting on grass.

Winter Dog of the Season: A brown dog wearing a red bandana, sitting in the snow.

Summer Dog of the Season: A brown dog wearing a patterned bandana, sitting on a wooden deck.

Step 3: Create A Cosmos DB Account/Database/Container

Home > Azure Cosmos DB >

Create Azure Cosmos DB Account - Azure Cosmos DB for NoSQL

Validation Success

Basics Global Distribution Networking Backup Policy Encryption Tags Review + create

Creation Time

Estimated Account Creation Time (in minutes) 2

The estimated creation time is calculated based on the location you have selected

Basics

Subscription	EWU Sub
Resource Group	TheoDoodleFinal
Location	West US
Account Name	(new) doodledatabase
API	Azure Cosmos DB for NoSQL
Capacity mode	Serverless

Backup Policy

Backup policy	Periodic
Backup storage redundancy	Geo-redundant backup storage

Networking

Connectivity method	All networks
Minimum TLS Protocol	TLS 1.2

Home > TheoDoodleFinal > doodledatabase

doodledatabase | Data Explorer

Azure Cosmos DB account

Search

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Quick start Notifications Data Explorer

NOSQL API

DATA

- TheoDoodleDatabase
 - Container1
 - Items
 - Settings
 - Stored Procedures
 - User Defined Functions
 - Triggers

SELECT * FROM c

id /email

Load more

Step 3a: Connect Database to my web app

```
PS C:\Users\beigh\OneDrive\Desktop\Final> npm install @azure/cosmos
```

```
// Replace these values with your Cosmos DB connection details
```

```
const cosmosEndpoint = 'https://doodledatabase.documents.azure.com:443/';
```

```
const cosmosKey = '8nWPvD9Ry8DeUPk1JCfxvm6AZ4Q4fWH6Hcw5yITVC3YFn6AYXF00xIXTwde9sOzNvJHT65YaAE5ACDbXt8cCg==';
```

```
const databaseId = 'TheoDoodleDatabase';
```

```
const containerId = 'Container1';
```

The screenshot shows the Azure Cosmos DB NOSQL API interface. On the left, a sidebar lists the database structure: 'DATA' > 'TheoDoodleDatabase' > 'Container1' > 'Items'. The main area displays a query result for 'SELECT * FROM c'. The result is a table with two columns: 'id' and '/email'. The first row shows the document ID '630d9403-c50a-48c7-8341-dffc30284025' and the email 'bmartinez14@ewu.edu'. A 'Load more' button is visible below the table. On the right, the raw JSON document is displayed, showing the email, id, _rid, _self, _etag, _attachments, and _ts fields.

id	/email
630d9403-c50a-48c7-8341-dffc30284025	bmartinez14@ewu.edu

```
1 {
2   "email": "bmartinez14@ewu.edu",
3   "id": "630d9403-c50a-48c7-8341-dffc30284025",
4   "_rid": "wf1+ALTSUCMDAAAAAAAAA==",
5   "_self": "dbs/wf1+AA==/colls/wf1+ALTSUCM=/docs/wf1+ALTSUCMDAAAAAAAAA==/",
6   "_etag": "\"69001be6-0000-0700-0000-656985000000\"",
7   "_attachments": "attachments/",
8   "_ts": 1701414144
9 }
```

Step 4: Application Insights and Monitoring

```
PS C:\Users\beigh\OneDrive\Desktop\Final> npm install applicationinsights
```

Home > Application Insights >

Application Insights

Monitor web app performance and usage

Basics Tags Review + create

Create an Application Insights resource to monitor your live web application. With Application Insights, you have full observability into your application across all components and dependencies of your complex distributed architecture. It includes powerful analytics tools to help you diagnose issues and to understand what users actually do with your app. It's designed to help you continuously improve performance and usability. It works for apps on a wide variety of platforms including .NET, Node.js and Java EE, hosted on-premises, hybrid, or any public cloud. [Learn More](#)

PROJECT DETAILS

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ EWU Sub
Resource Group * ⓘ TheoDoodleFinal
[Create new](#)

INSTANCE DETAILS

Name * ⓘ DoodleInsights ✓
Region * ⓘ (US) East US
Resource Mode * ⓘ Classic **Workspace-based**

WORKSPACE DETAILS

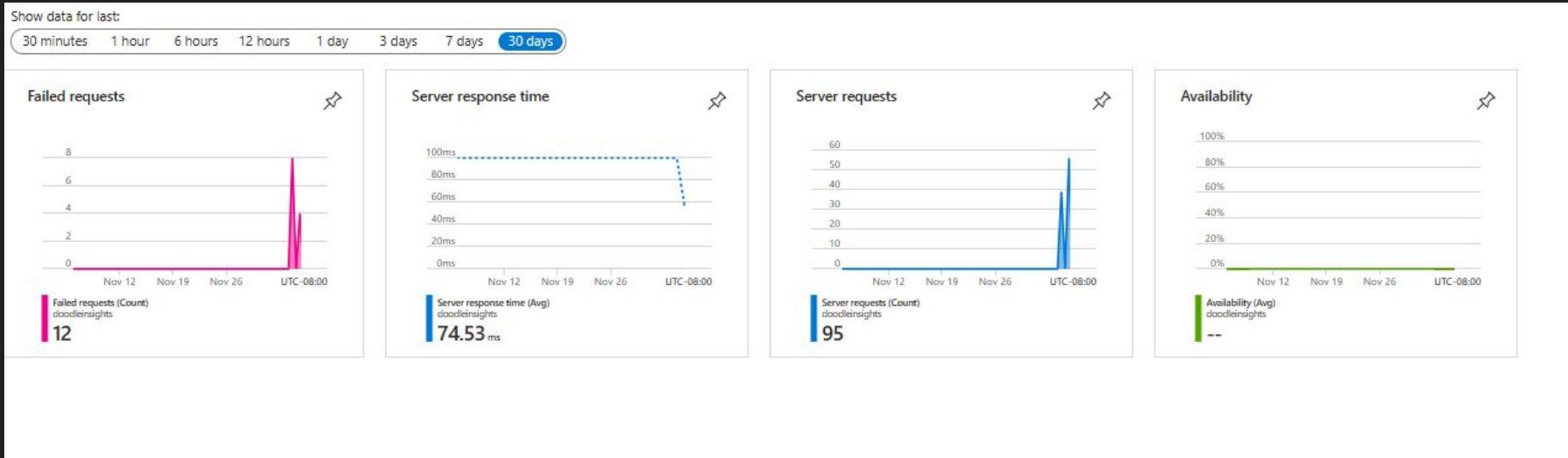
Subscription * ⓘ EWU Sub
Log Analytics Workspace * ⓘ (new) DefaultWorkspace-b079418-7a87-4e01-9498-741b460d9f11-EUS [...]

```
const appInsights = require('applicationinsights');  
appInsights.setup('08858e7c-2582-4d16-8c7b-8797c3515042').start();
```

Why Insights and Monitoring?

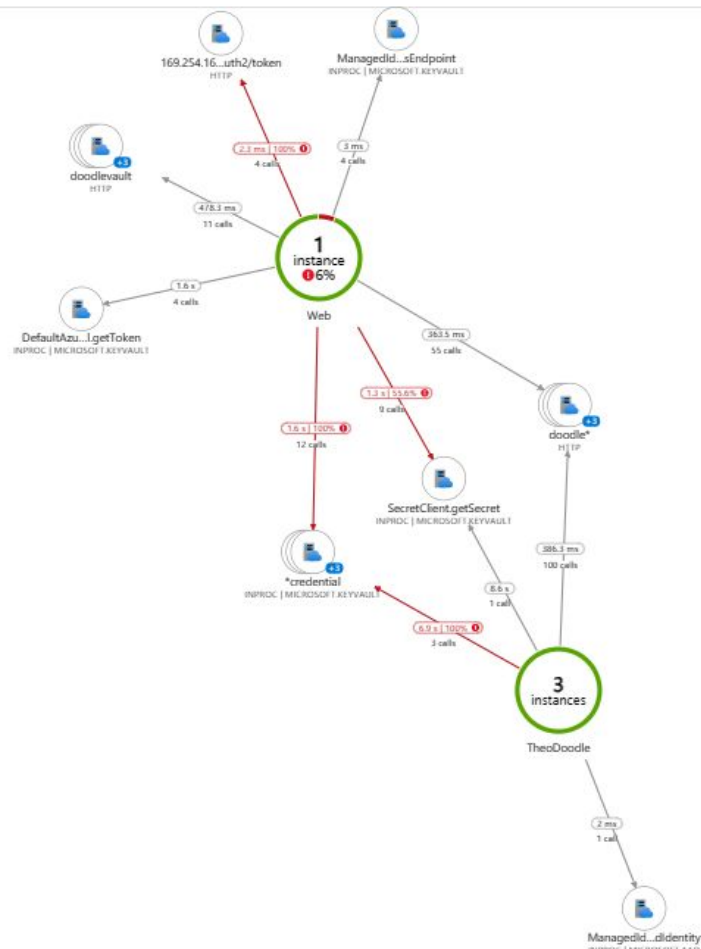
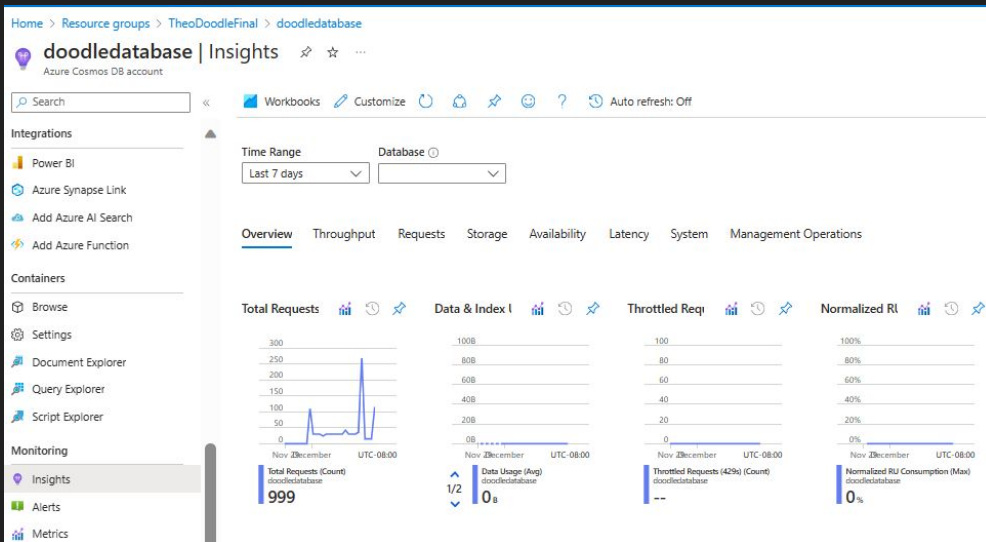
- Good for real time visibility into application performance
- Detects and troubleshoots issues
- Helps optimize resource usage
- Enhances Security

Step 4a: Application Insights and Monitoring



Step 4b:

Application Map & insight on database



Step 5: Key Vault Set-up

```
PS C:\Users\beigh\OneDrive\Desktop\Final> npm install @azure/keyvault-secrets
```

Home > Key vaults >

Create a key vault

Basics Access configuration Networking Tags Review + create

Review + create

Basics

Subscription	EWU Sub
Resource group	TheoDoodleFinal
Key vault name	doodleVault
Region	East US
Pricing tier	Standard
Soft-delete	Enabled
Purge protection during retention period	Disabled
Days to retain deleted vaults	90 days

Access configuration

Azure Virtual Machines for deployment	Disabled
Azure Resource Manager for template deployment	Disabled
Azure Disk Encryption for volume encryption	Disabled
Permission model	Azure role-based access control

Networking

Connectivity method	Public endpoint (all networks)
---------------------	--------------------------------

TheoDoodle assignments - doodleVault

Current role assignments

Eligible assignments

Assignments for the selected user, group, service principal, or managed identity at this scope or inherited to this scope.

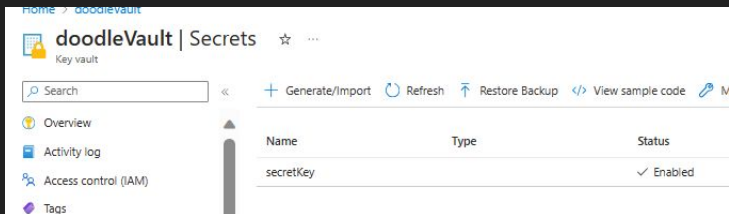
Search by assignment name or description

Role assignments (1)

Role	Description	Scope	Group assignment	Condition
Key Vault Secrets User	Read secret contents. Only works...	This resource	--	None

- Was Hard coding keys into my backend so I decided to add a key vault and use secrets for security purposes.

Step 5a: Key Vault Setup Cosmos

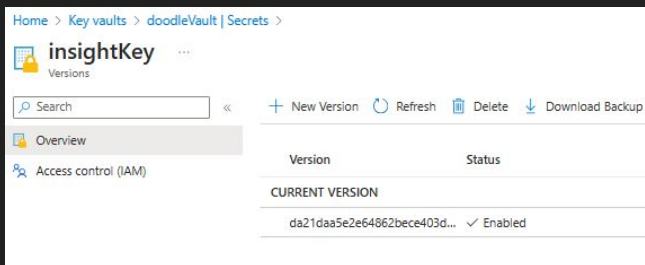


```
// Initialize Cosmos DB client
const databaseId = 'TheoDoodleDatabase';
const containerId = 'Container1';
const cosmosEndpoint = 'https://doodledatabase.documents.azure.com:443/';
```

```
async function getKeyVaultSecret(secretName) {
  const keyVaultUrl = 'https://doodlevault.vault.azure.net/';
  const credential = new DefaultAzureCredential();
  const secretClient = new SecretClient(keyVaultUrl, credential);
  return secretClient.getSecret(secretName);
}
```

```
// Fetch Cosmos DB secrets from Key Vault
const cosmosSecret = await getKeyVaultSecret('secretKey');
const cosmosClient = new CosmosClient({ endpoint: cosmosEndpoint, key: cosmosSecret.value });
const database = cosmosClient.database(databaseId);
const container = database.container(containerId);
```


Step 5B: Key Vault Set-up App Insight Key



```
// Fetch Application Insights instrumentation key from Key Vault
const appInsightsSecret = await getKeyVaultSecret('insightKey');
const appInsightsKey = appInsightsSecret.value;
```

```
// Set up Application Insights with the retrieved key
const appInsights = require('applicationinsights');
appInsights.setup(appInsightsKey).start();
```

```
/*const appInsights = require('applicationinsights');
appInsights.setup('08858e7c-2582-4d16-8c7b-8797c3515042').start();
*/
```

Step 6: Logic App for subscription Email

Home > Logic apps >

Create Logic App

Create a logic app, which lets you group workflows as a logical unit for easier management, deployment and sharing of resources. Workflows let you connect your business-critical apps and services with Azure Logic Apps, automating your workflows without writing a single line of code.

Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource Group *
[Create new](#)

Instance Details

Logic App name *
✖ Consumption type Logic App name must be unique in each resource group.

Region *

Enable log analytics * ☐ Yes ☒ No

Plan

The plan type you choose dictates how your app scales, what features are enabled, and how it is priced. [Learn more](#)

Plan type *

- ☐ **Standard:** Best for enterprise-level, serverless applications, with event-based scaling and networking isolation.
- ☒ **Consumption:** Best for entry-level. Pay only as much as your workflow runs.
- ☐ Looking for the classic consumption create experience? [Click here](#)

Zone redundancy (preview)

Set up your Consumption logic app to use availability zones in Azure regions that support zone redundancy. This option is available only when you create and deploy your logic app. Eventually, all Consumption logic apps in zone supported regions will enable availability zones by default. [Learn more](#)

Zone redundancy

- ☐ **Enabled:** Your Consumption logic app uses availability zone.
- ☒ **Disabled:** Your Consumption logic app doesn't use availability zones.

When a HTTP request is received

HTTP POST URL

Request Body JSON Schema

```
{  "properties": {    "email": {      "type": "string"    }  },  "type": "object"}
```

[Use sample payload to generate schema](#)

+

Send email (V2)

*To

Body

Font 12 B I U

Thanks for signing up!

Subject

Connected to gmailConnection. [Change connection.](#)

Step 6a: Code Implementation:

```
// Logic app
fetch('https://prod-01.eastus.logic.azure.com:443/workflows/dd7e8c80bb1
method: 'POST',
headers: {
  'Content-Type': 'application/json',
},
body: JSON.stringify({ email }),
})
.then(response => response.json())
.then(data => {
  console.log('Logic App Response:', data);

  // Clear the email input after successful submission
  emailInput.value = '';
}));
```

HTML/front-end

```
// Logic App email
const logicAppEndpoint = 'https://prod-01.eastus.logic.azure.com:443/workflows/dd7e8c80bb664f2d8';

const logicAppRequestBody = {
  email: email,
};


await fetch(logicAppEndpoint, {
  method: 'POST',
  headers: {
    'Content-Type': 'application/json',
  },
  body: JSON.stringify(logicAppRequestBody),
});

catch (error) {
  console.error('Error creating item in Cosmos DB:', error);
  res.status(500).json({ error: 'Internal Server Error. Please try again later for Cosmos DB.' });
}
```

Javascript/backend







Step 6B: Sending Email



 Send email (V2) ...

* To

Body

Tahoma 12 B I U      

Thank you for subscribing to our newsletter!

Dear TheoDoodle Fans,

Get ready for some doodle-rific news! We are excited to share the latest updates and happenings at TheoDoodle. Our doodle community is growing, and we want you to be part of the excitement.

TheoDoodle Event
Join us for our upcoming doodle event on 12-26. It's a paw-ty you won't want to miss!

Don't miss out on the doodle fun!

Stay connected with TheoDoodle Family:
Visit our website: <https://thedoodle.azurewebsites.net/>
Follow us on Instagram: [its_TheoDoodle](#)
Like us on Facebook: [TheoDoodle](#)

Subject

Importance

Connected to gmailConnection. [Change connection.](#)

TheoDoodle Newsletter inbox x

thedoodlenotifications@gmail.com

to me

3:57 PM (2 minutes ago)



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