Final Presentation CSCD 396- Azure

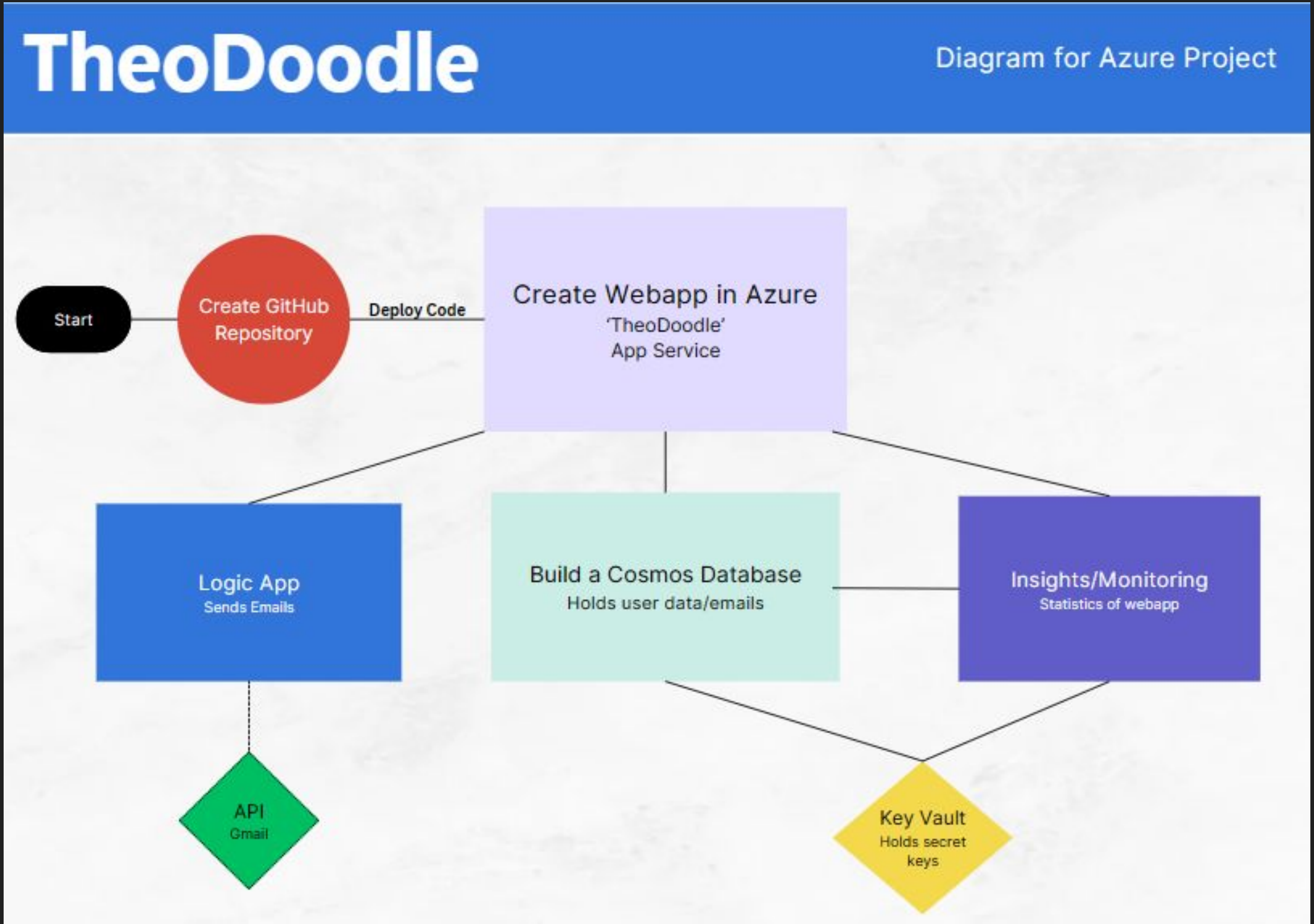
Fall Quarter 2023
By Beighlor Martinez

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 pdf.

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

Start

Create GitHub Repository

Deploy Code

Create Webapp in Azure
'TheoDoodle'
App Service

Logic App
Sends Emails

Build a Cosmos Database
Holds user data/emails

Insights/Monitoring
Statistics of webapp

API
Gmail

Key Vault
Holds secret keys

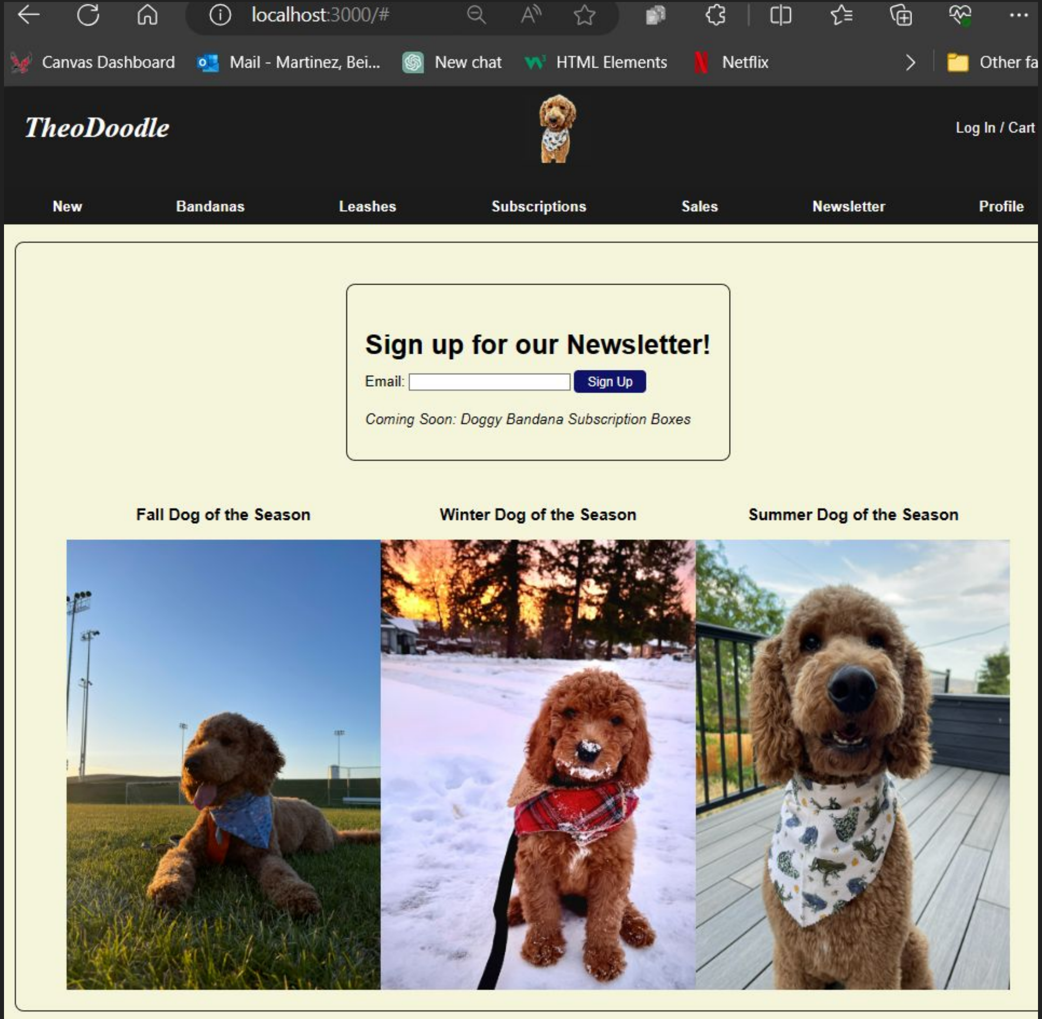
- ★ Github deploys code to web-app
- ★ Web-app is connected to logic app, cosmos db, and insights
- ★ Key-vault stores secrets for insights and cosmos
- ★ Insights is connected to monitor cosmos and webapp
- ★ Logic App is connected to API and web app

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.



Sign up for our Newsletter!

Email: Sign Up

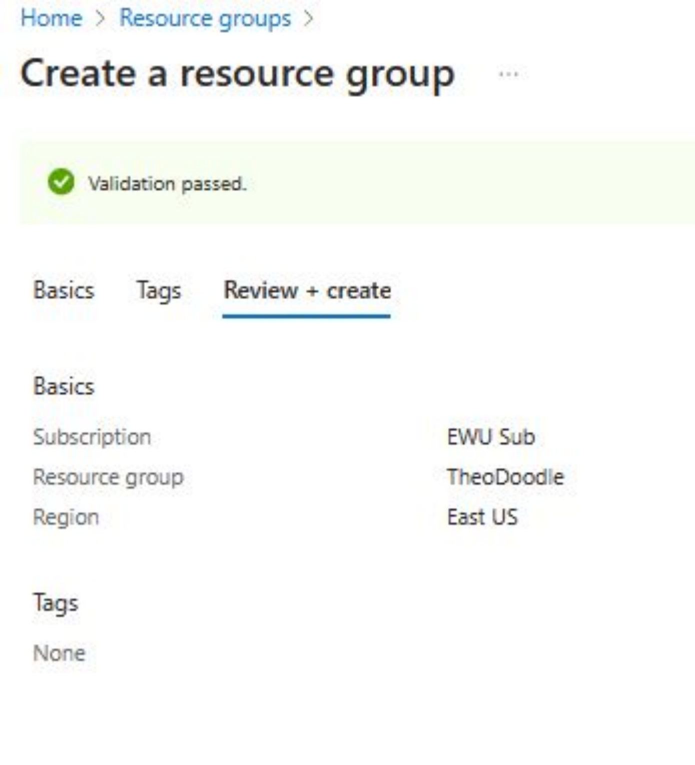
Coming Soon: Doggy Bandana Subscription Boxes

Fall Dog of the Season

Winter Dog of the Season

Summer Dog of the Season

Step 1: Create a Resource Group



Create a resource group

Validation passed.

Basics

Subscription	EWU Sub
Resource group	TheoDoodle
Region	East US

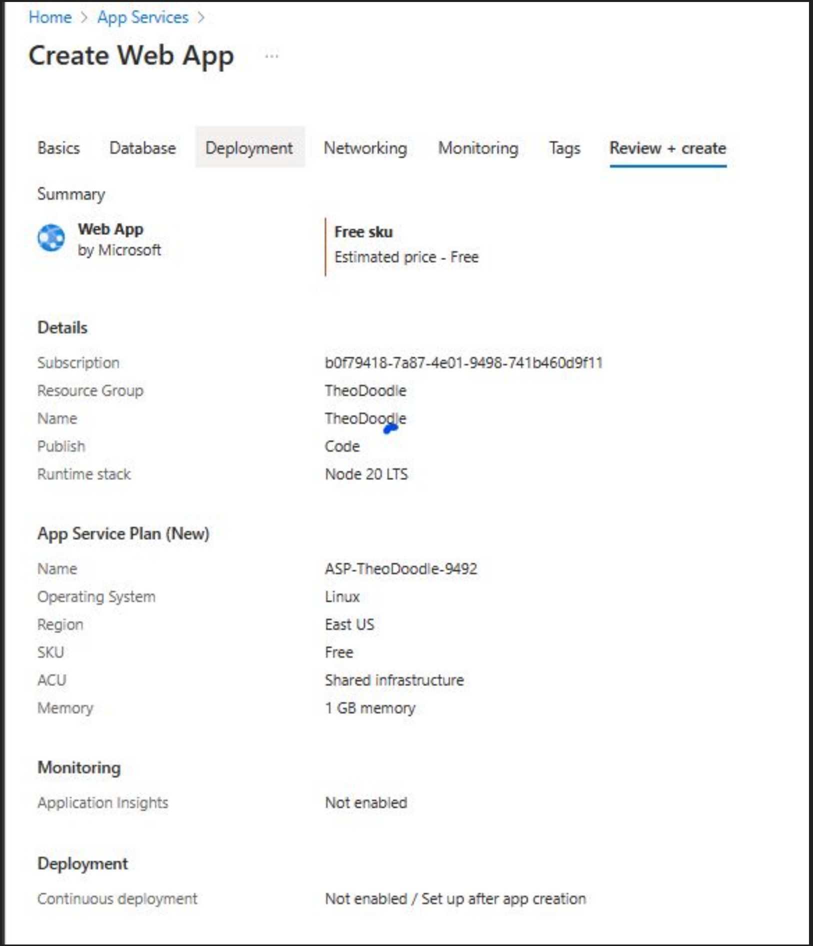
Tags

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



Create Web App

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

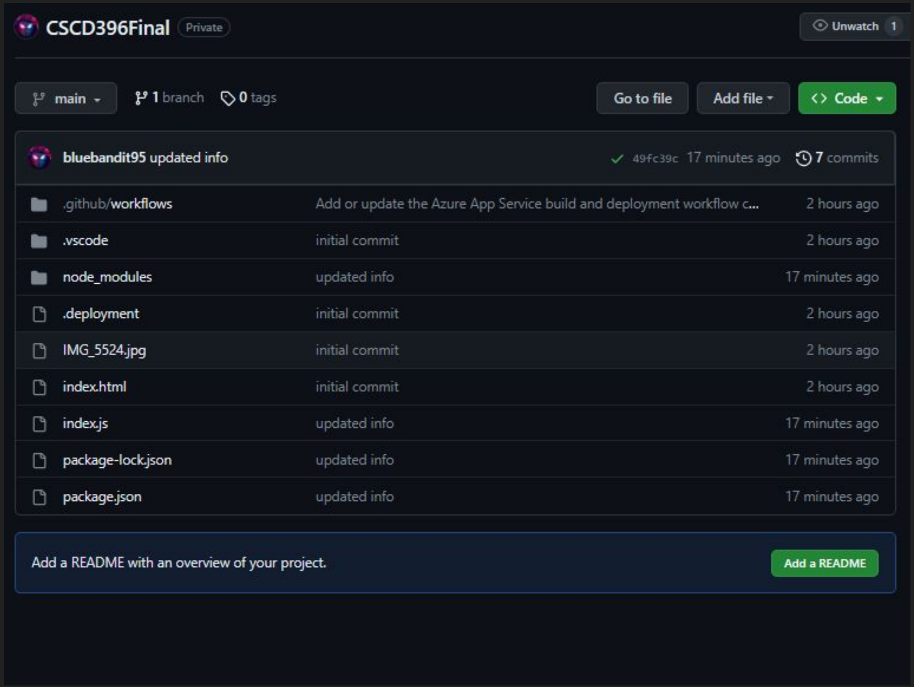
Monitoring

Application Insights	Not enabled

Deployment

Continuous deployment	Not enabled / Set up after app creation

Step 2a: Deploy Code Using Github

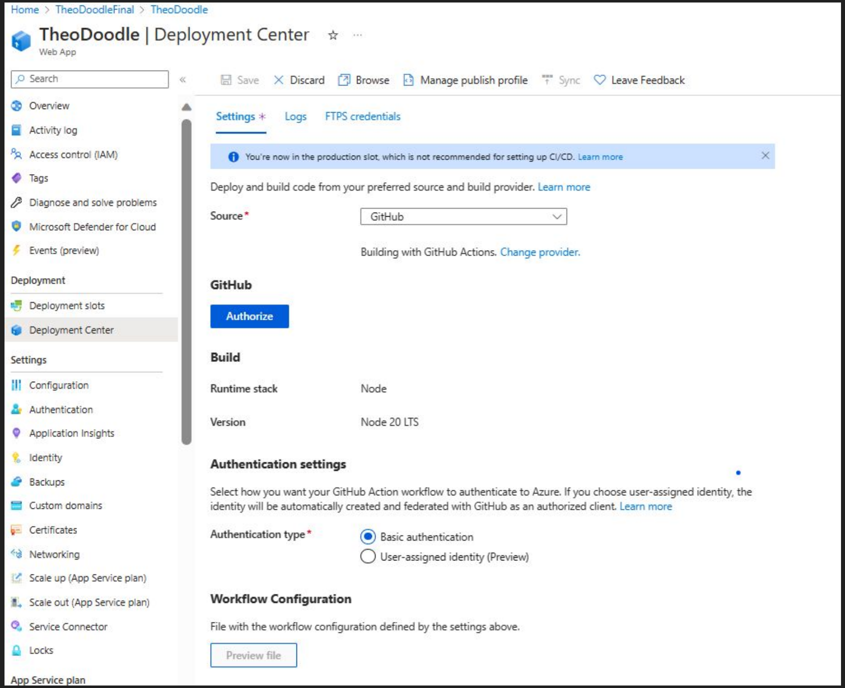


CSCD396Final Private

bluebandit95 updated info ✓ 49fc39c 17 minutes ago 7 commits

.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

Add a README with an overview of your project.



Home > TheoDoodleFinal > TheoDoodle

TheoDoodle | Deployment Center
Web App

You're now in the production slot, which is not recommended for setting up CI/CD. Learn more

Deploy and build code from your preferred source and build provider. Learn more

Source * GitHub

Building with GitHub Actions. Change provider.

GitHub

Build

Runtime stack Node

Version Node 20 LTS

Authentication settings

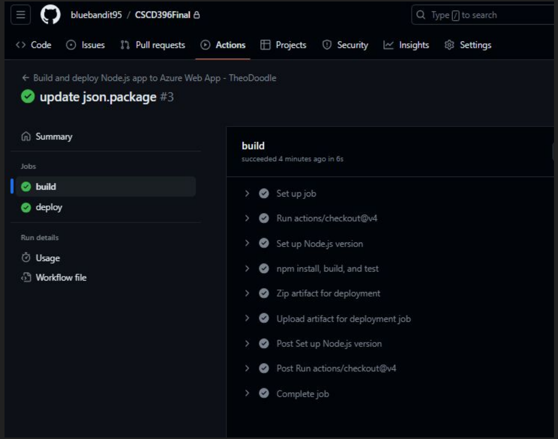
Select how you want your GitHub Action workflow to authenticate to Azure. If you choose user-assigned identity, the identity will be automatically created and federated with GitHub as an authorized client. Learn more

Authentication type * ● Basic authentication ○ User-assigned identity (Preview)

Workflow Configuration

File with the workflow configuration defined by the settings above.

Step 2b: Check if everything is working properly



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

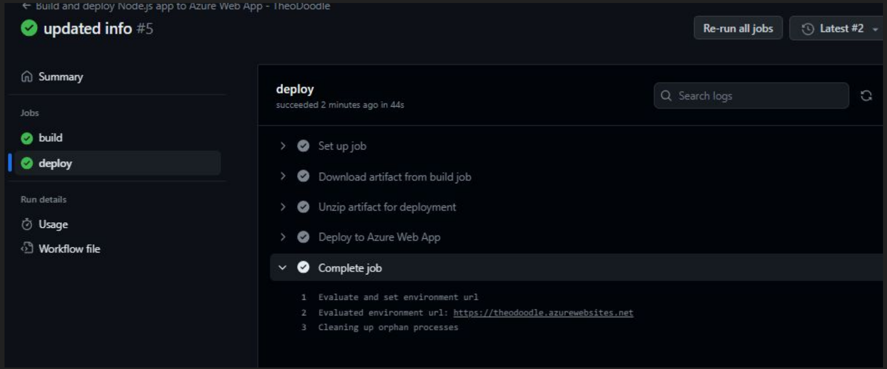
update json.package #3

- build
- deploy

build

succeeded 4 minutes ago in 6s

- 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 - TheoDoodle

updated info #5

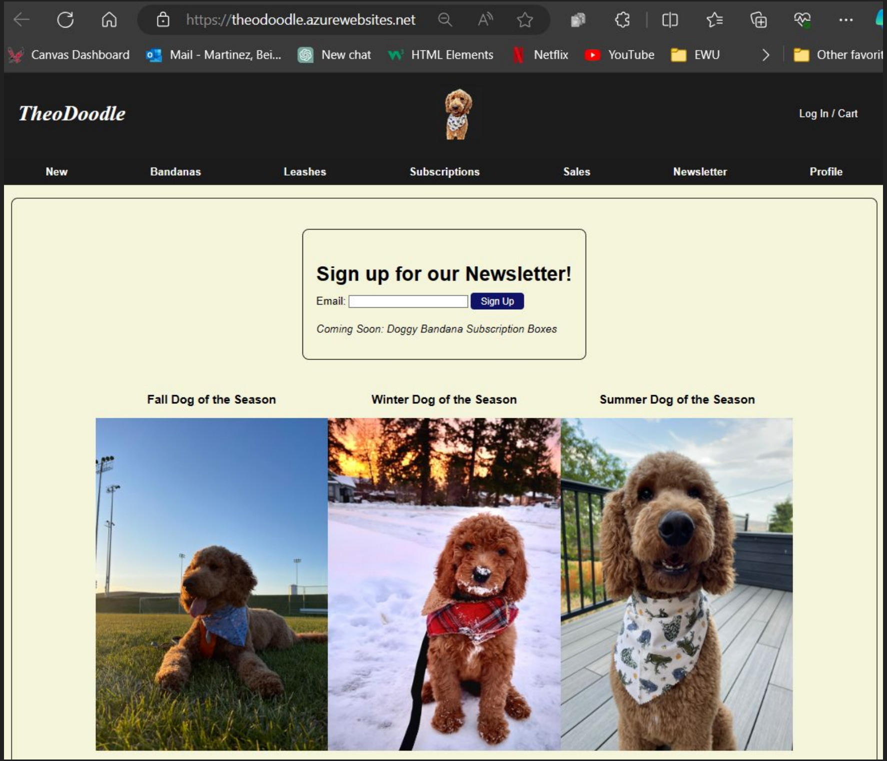
- build
- deploy

deploy

succeeded 2 minutes ago in 44s

- 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://theodoodle.azurewebsites.net
Cleaning up orphan processes
```



Sign up for our Newsletter!

Email:

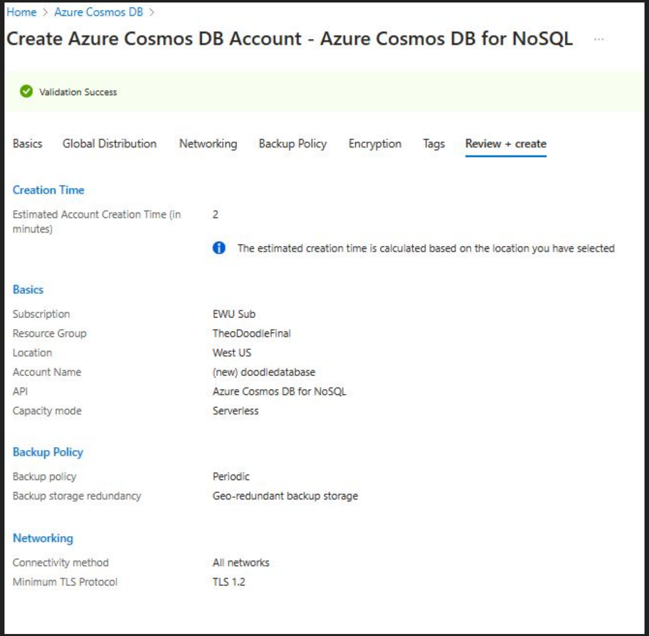
Coming Soon: Doggy Bandana Subscription Boxes

Fall Dog of the Season

Winter Dog of the Season

Summer Dog of the Season

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

Creation Time

Estimated Account Creation Time (in minutes): 2

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

Basics

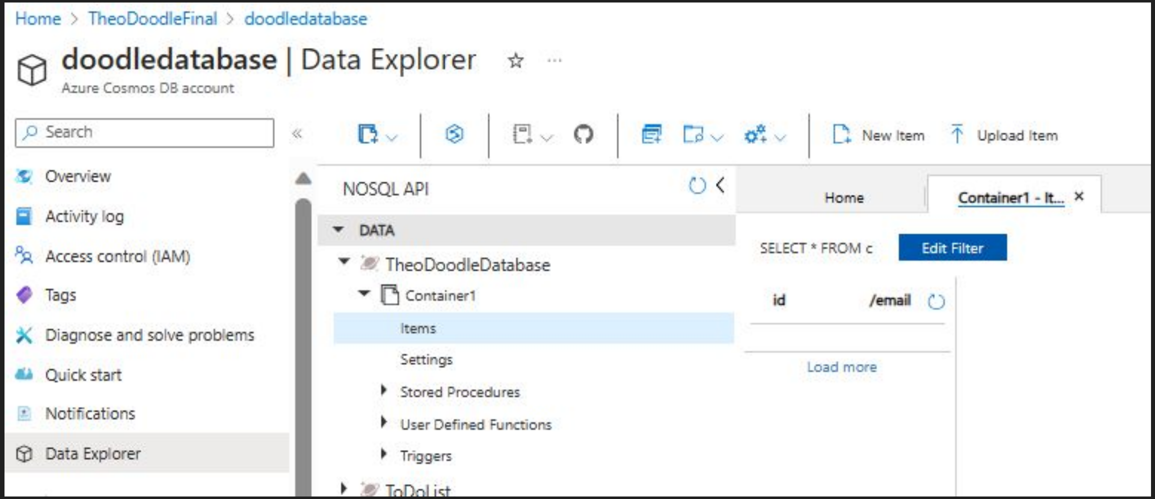
Subscription	EWU Sub
Resource Group	TheoDoodleFinal
Location	West US
Account Name	(new) doodledatabase
API	Azure Cosmos DB for NoSQL
Capacity mode	Serverless

Backup Policy

Backup policy	Periodic
Backup storage redundancy	Geo-redundant backup storage

Networking

Connectivity method	All networks
Minimum TLS Protocol	TLS 1.2



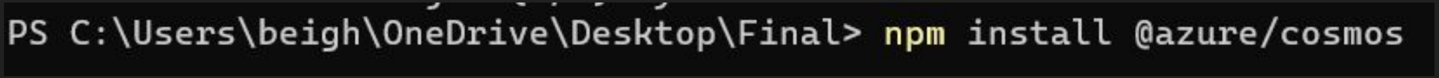
Home > TheoDoodleFinal > doodledatabase

doodledatabase | Data Explorer

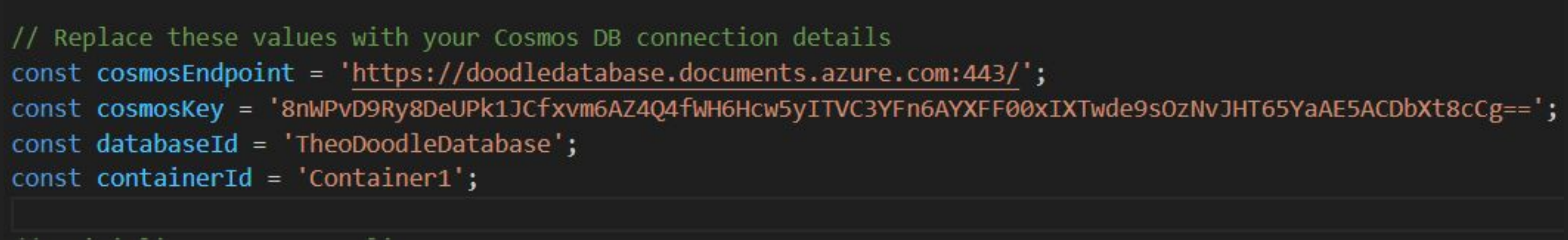
Azure Cosmos DB account

SELECT * FROM c

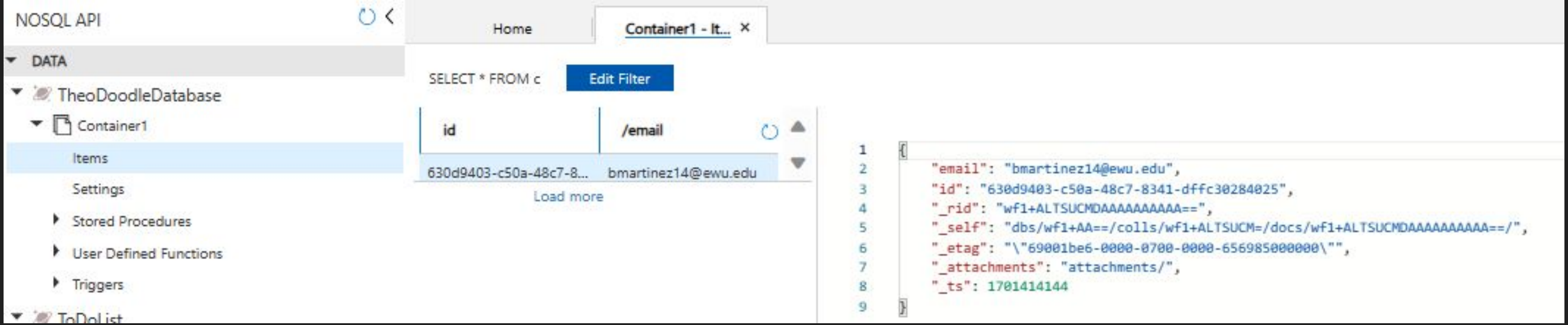
Step 3a: Connect Database to my web app



```
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 = '8nWPvD9Ry8DeUPk1JCfxvm6AZ4Q4fWH6Hcw5yITVC3YFn6AYXFF00xIXTwde9sOzNvJHT65YaAE5ACDbXt8cCg==';
const databaseId = 'TheoDoodleDatabase';
const containerId = 'Container1';
```

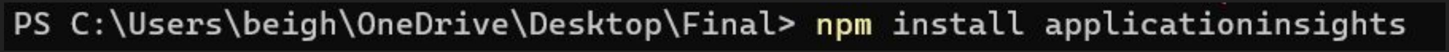


SELECT * FROM c

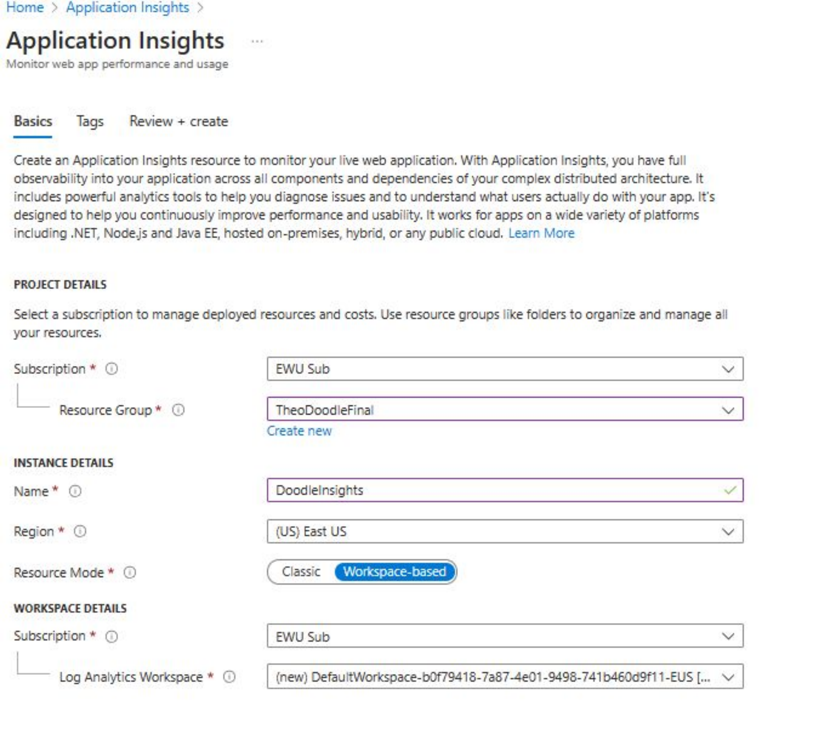
id	/email
630d9403-c50a-48c7-8...	bmartinez14@ewu.edu

```
{
    "email": "bmartinez14@ewu.edu",
    "id": "630d9403-c50a-48c7-8341-dffc30284025",
    "_rid": "wf1+ALTSUCMDAAAAAAAAAA==",
    "_self": "dbs/wf1+AA==/colls/wf1+ALTSUCM=/docs/wf1+ALTSUCMDAAAAAAAAAA==/",
    "_etag": "\"69001be6-0000-0700-0000-656985000000\"",
    "_attachments": "attachments/",
    "_ts": 1701414144
}
```

Step 4: Application Insights and Monitoring



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



Application Insights

Monitor web app performance and usage

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.

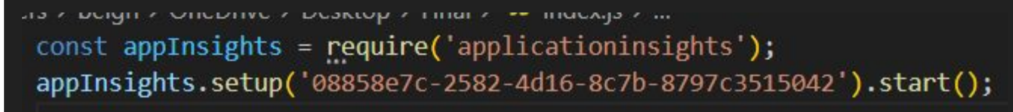
Subscription *	EWU Sub
Resource Group *	TheoDoodleFinal Create new

INSTANCE DETAILS

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

WORKSPACE DETAILS

Subscription *	EWU Sub
Log Analytics Workspace *	(new) DefaultWorkspace-b0f79418-7a87-4e01-9498-741b460d9f11-EUS [...

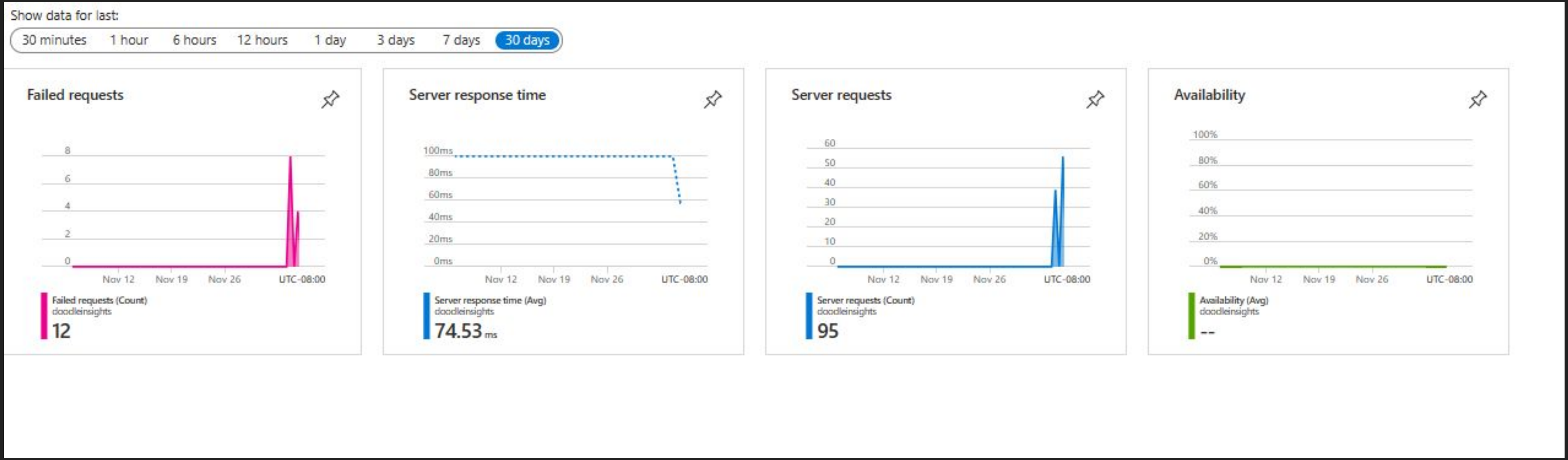


```
const appInsights = require('applicationinsights');
appInsights.setup('08858e7c-2582-4d16-8c7b-8797c3515042').start();
```

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


Show data for last:

30 minutes | 1 hour | 6 hours | 12 hours | 1 day | 3 days | 7 days | [✓ 30 days]

Failed requests

Failed requests (Count)
doodleinsights
12

Server response time

Server response time (Avg)
doodleinsights
74.53 ms

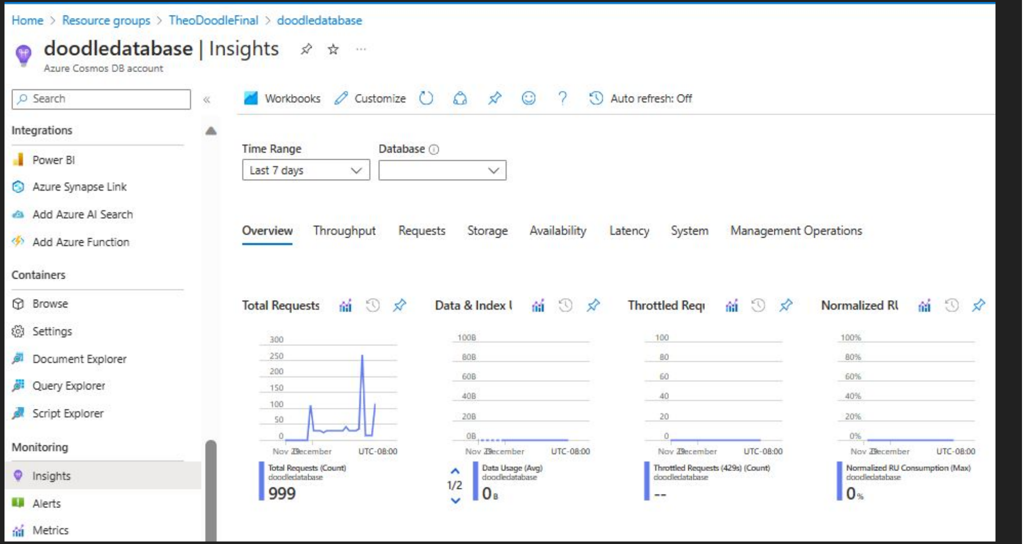
Server requests

Server requests (Count)
doodleinsights
95

Availability

Availability (Avg)
doodleinsights
--

Step 4b: Application Map & insight on database



Home > Resource groups > TheoDoodleFinal > doodledatabase

doodledatabase | Insights

Azure Cosmos DB account

Time Range: Last 7 days

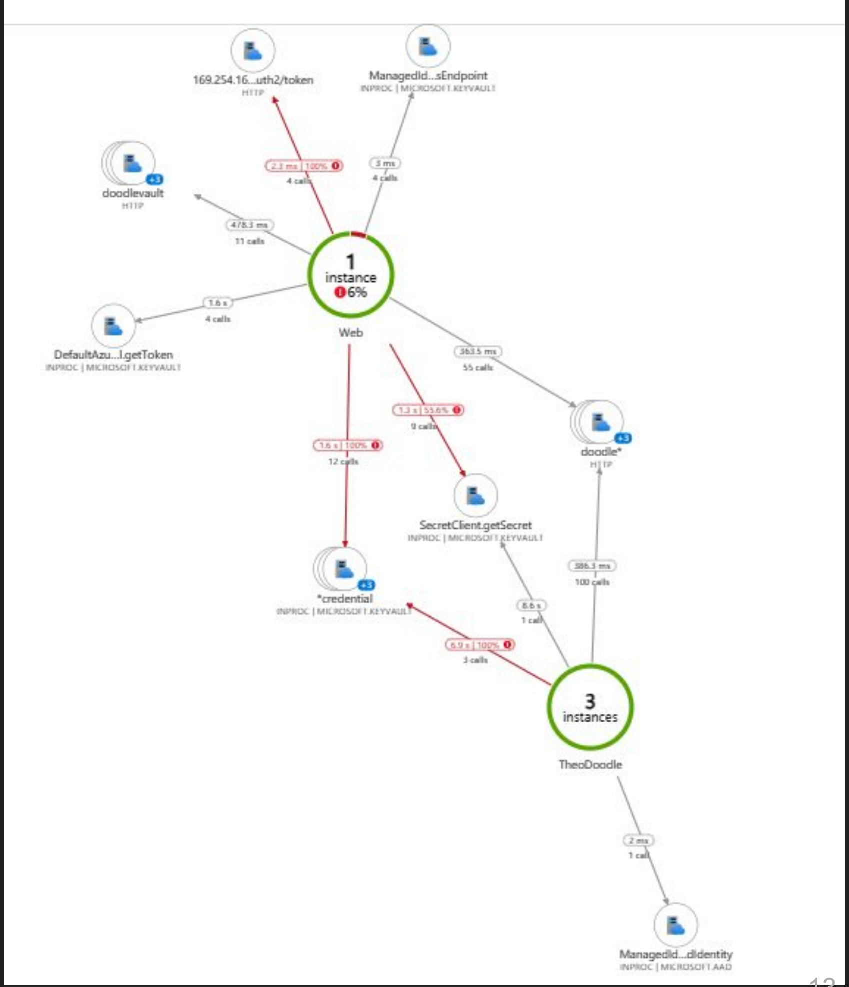
Database:

Total Requests (Count) doodledatabase 999

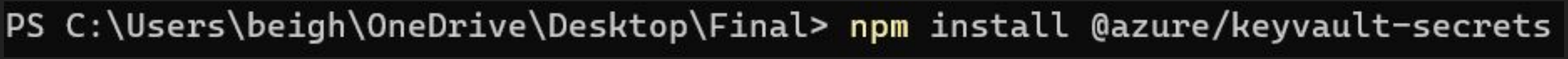
Data Usage (Avg) doodledatabase 0B

Throttled Requests (429s) (Count) doodledatabase --

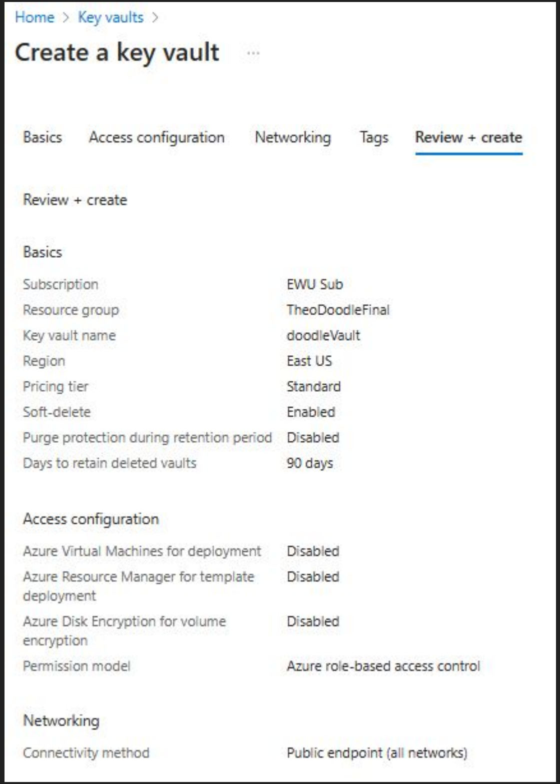
Normalized RU Consumption (Max) doodledatabase 0%



Step 5: Key Vault Set-up



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



Create a key vault

Review + create

Basics

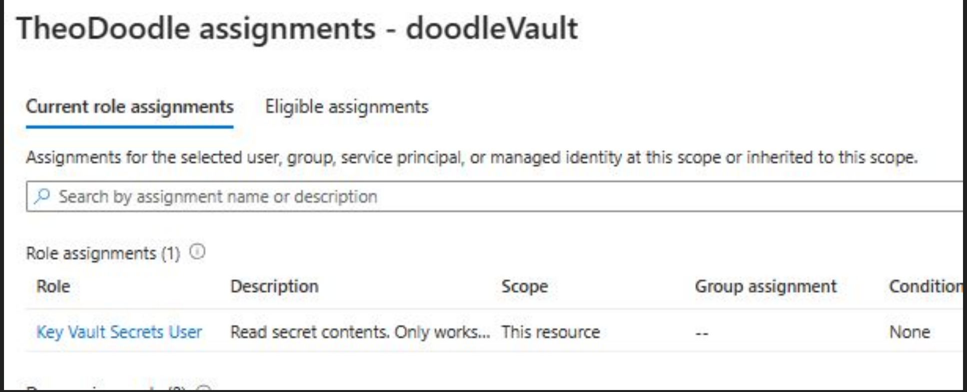
Subscription	EWU Sub
Resource group	TheoDoodleFinal
Key vault name	doodleVault
Region	East US
Pricing tier	Standard
Soft-delete	Enabled
Purge protection during retention period	Disabled
Days to retain deleted vaults	90 days

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

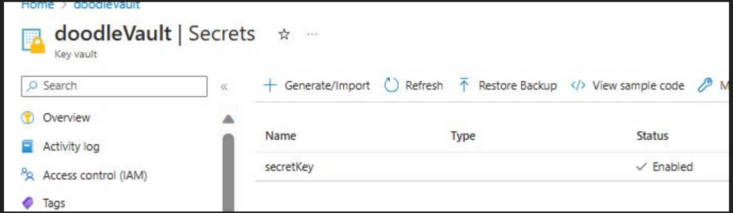
Assignments for the selected user, group, service principal, or managed identity at this scope or inherited to this scope.

Role assignments (1)

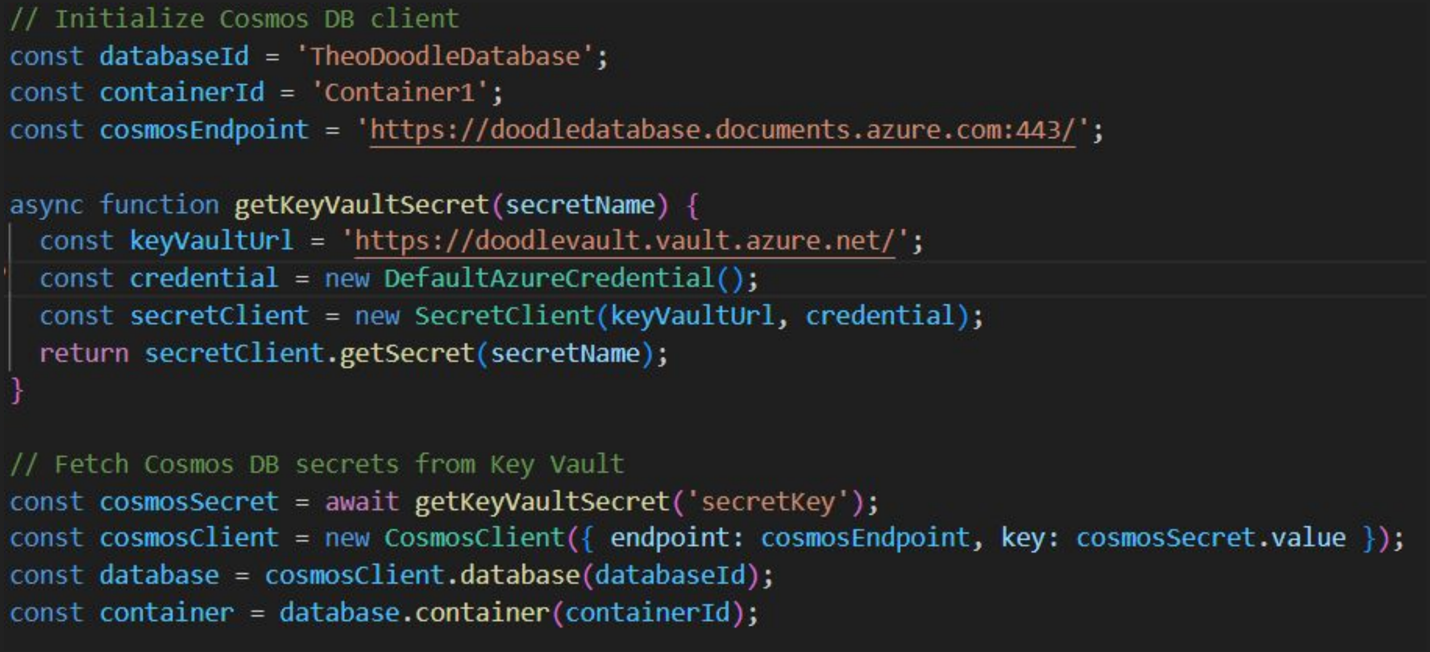
Role	Description	Scope	Group assignment	Condition
Key Vault Secrets User	Read secret contents. Only works...	This resource	--	None

- 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



Name	Type	Status
secretKey		✓ Enabled

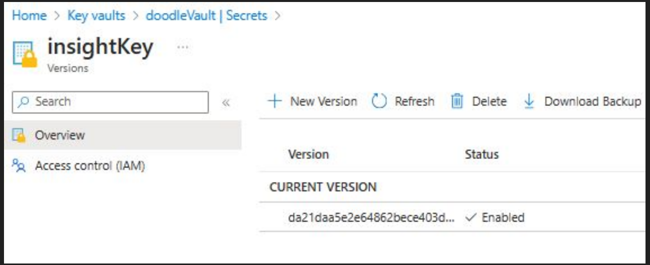


```
// Initialize Cosmos DB client
const databaseId = 'TheoDoodleDatabase';
const containerId = 'Container1';
const cosmosEndpoint = 'https://doodledatabase.documents.azure.com:443/';

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

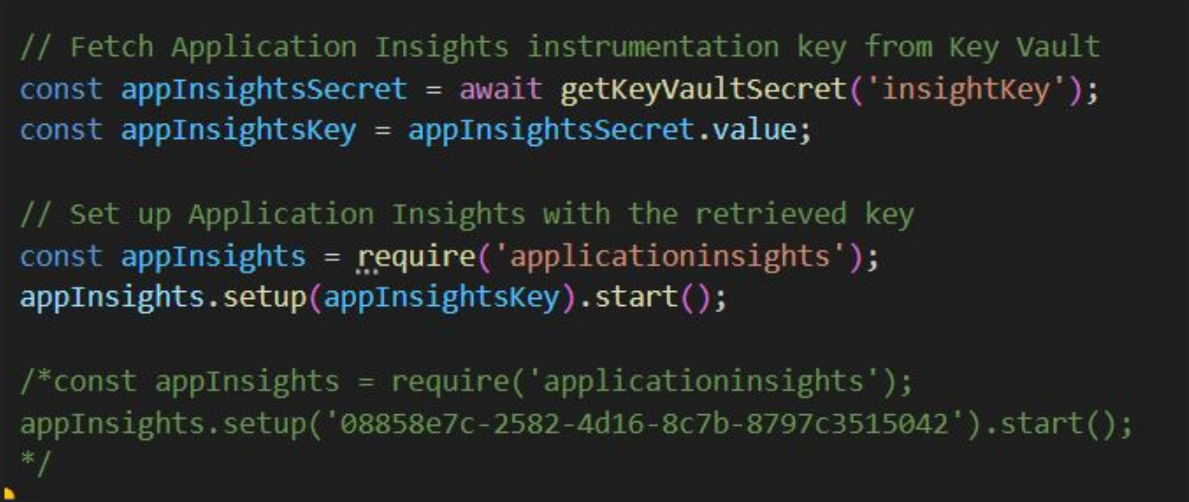


Home > Key vaults > doodleVault | Secrets >

insightKey

Versions

Version	Status
CURRENT VERSION	
da21daa5e2e64862bece403d...	✓ Enabled

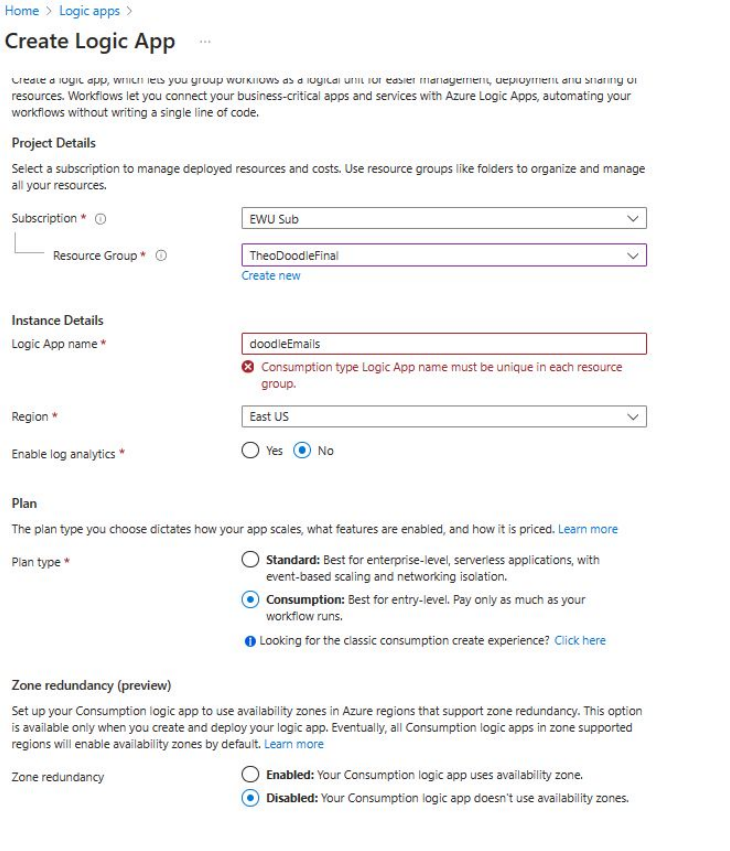


```
// Fetch Application Insights instrumentation key from Key Vault
const appInsightsSecret = await getKeyVaultSecret('insightKey');
const appInsightsKey = appInsightsSecret.value;

// 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 * : EWU Sub

Resource Group * : TheoDoodleFinal

Create new

Instance Details

Logic App name * : doodleEmails

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

Region * : East US

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

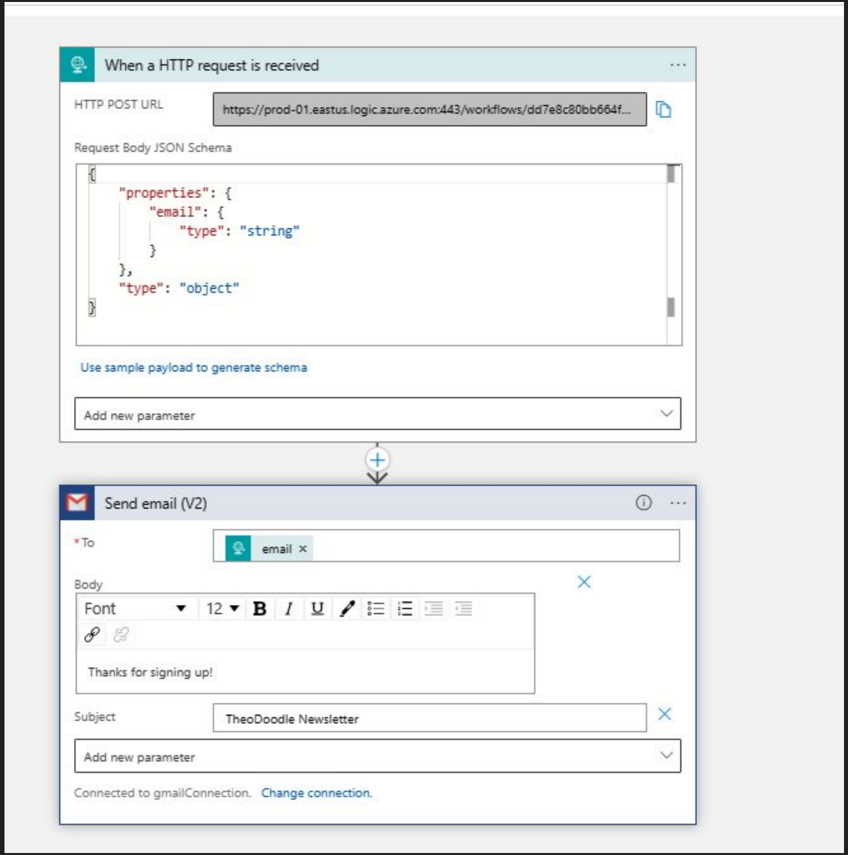
Zone redundancy (preview)

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: https://prod-01.eastus.logic.azure.com:443/workflows/dd7e8c80bb664f...

Request Body JSON Schema

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

Use sample payload to generate schema

Add new parameter

Send email (V2) ···

*To: email ×

Body

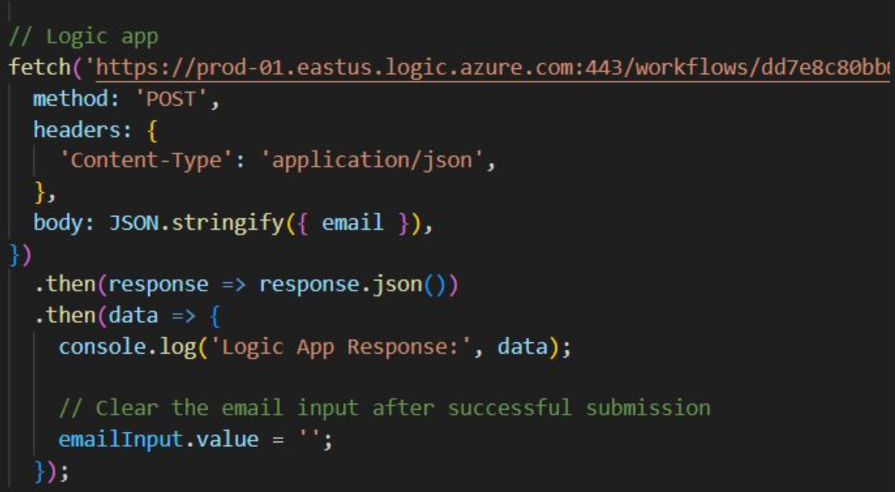
Thanks for signing up!

Subject: TheoDoodle Newsletter

Add new parameter

Connected to gmailConnection. Change connection.

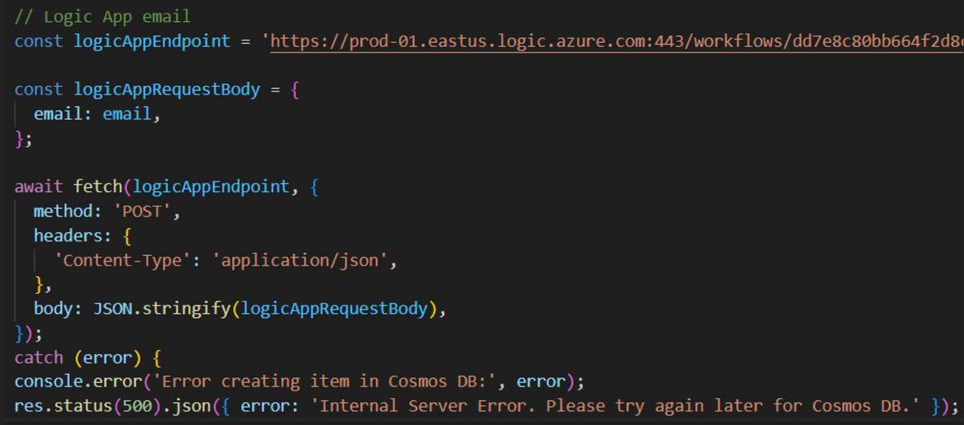
Step 6a: Code Implementation:



```
// Logic app
fetch('https://prod-01.eastus.logic.azure.com:443/workflows/dd7e8c80bb
  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



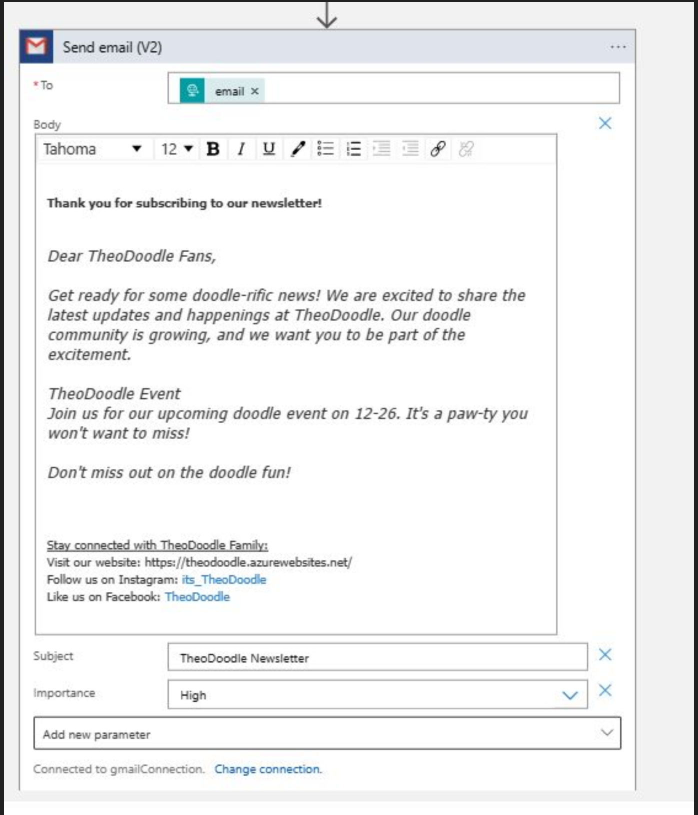
```
// Logic App email
const logicAppEndpoint = 'https://prod-01.eastus.logic.azure.com:443/workflows/dd7e8c80bb664f2d8

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



*To: email

Body

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.

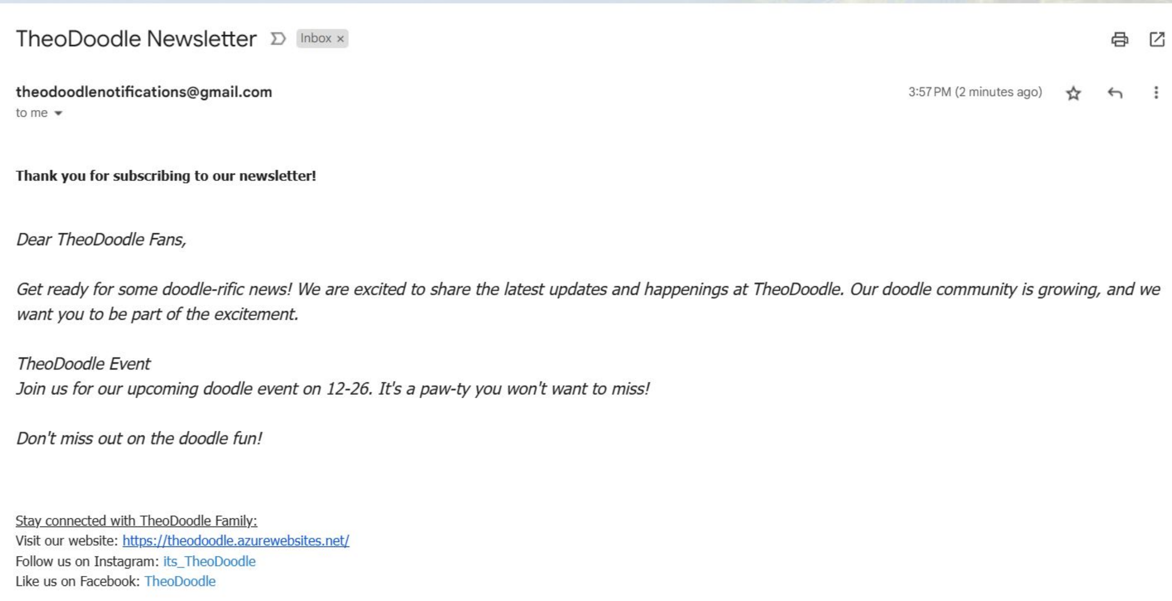
TheoDoodle Event
Join us for our upcoming doodle event on 12-26. It's a paw-ty you won't want to miss!

Don't miss out on the doodle fun!

Stay connected with TheoDoodle Family:
Visit our website: https://theodoodle.azurewebsites.net/
Follow us on Instagram: its_TheoDoodle
Like us on Facebook: TheoDoodle

Subject: TheoDoodle Newsletter

Importance: High



TheoDoodle Newsletter

theodoodlenotifications@gmail.com
to me

3:57 PM (2 minutes ago)

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:
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