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AWS S3 static web site hosting
&
CICD Pipeline using GitHub

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AWS cloud technology enthusiast
Technology Program Manager

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http://girishbhatia.tech

About Girish Bhatia

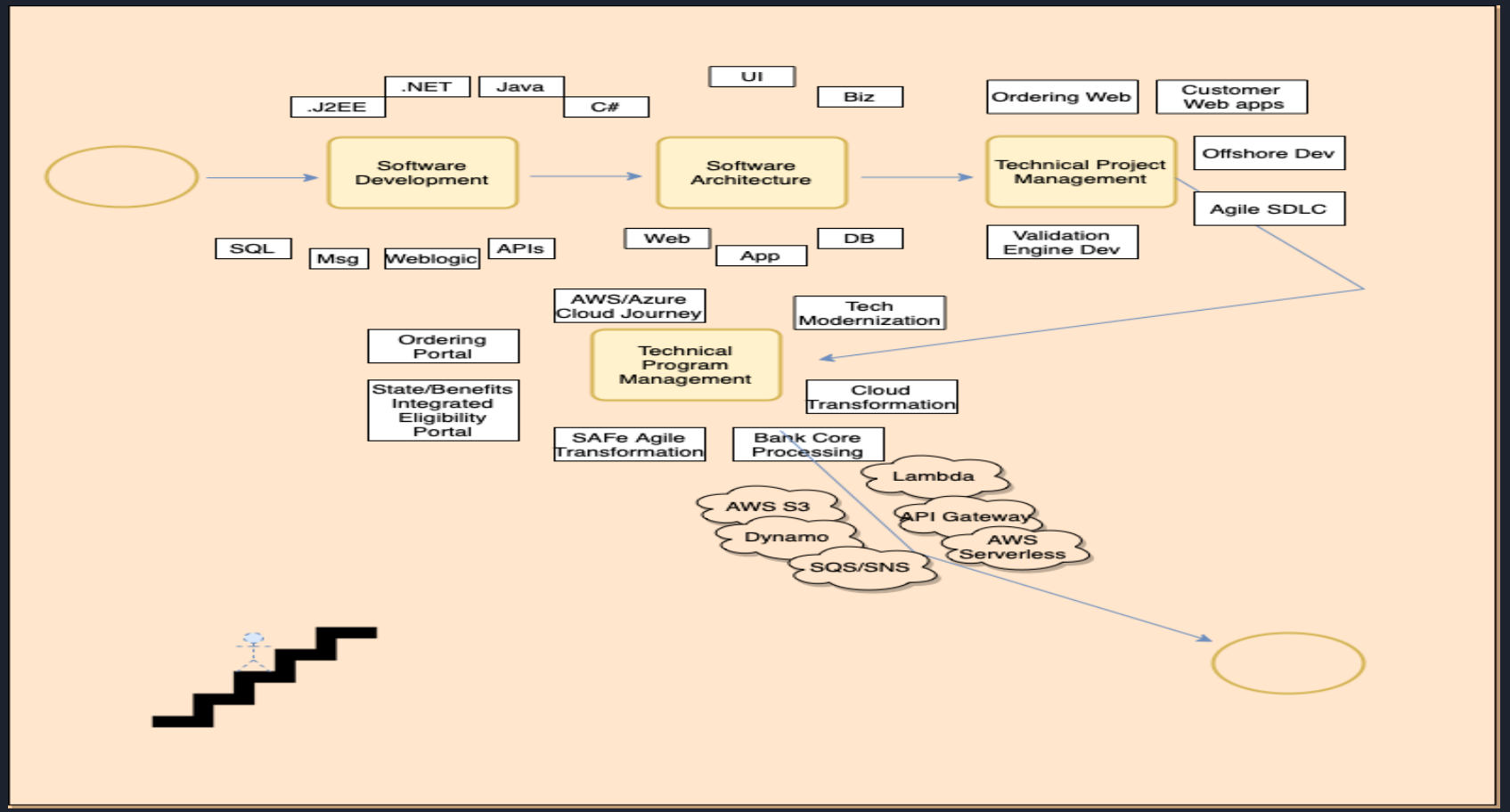
Qualifications:

- Master of Science in Computer Information Systems
- AWS Certified Developer Associate | Amazon Web Services
- AWS Certified Solution Architect: Associate I Amazon Web Services
- AWS Certified Cloud Practitioner I Amazon Web Services
- AWS badges: Serverless, Solution Architecture
- Microsoft Certified: Azure Fundamentals I Microsoft
- Microsoft Certified Professional: Solution Architecture I Microsoft
- Microsoft Certified .NET Solutions Developer I Microsoft
- Project Management Professional (PMP) | Project Management Institute
- Certified Scrum Master | Scrum Alliance)

IT Experience:

- 20+ years in IT
- Software Development using Java, .NET, Oracle, APIs, BI tools in telecom, public/state system, banking/finance domain.
- Onshore/offshore software delivery
- Tech Program/Project Management
- Journey to Cloud, Tech Modernization
- On Prim to Cloud Migration
- Cloud/API integration B2B
- Data center planning/Mainframe Relocation

Girish's Tech Journey



AWS S3 Static Website Hosting & CICD Pipeline using GitHub

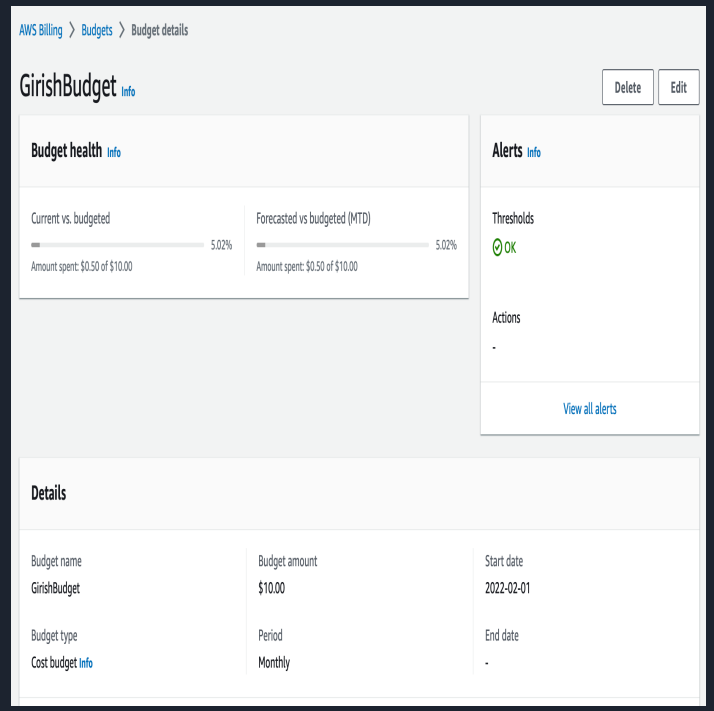
- AWS S3 Static Website Hosting
- CICD Pipeline using GitHub
- Update S3 Website using CICD Pipeline

AWS S3 Static Website Hosting

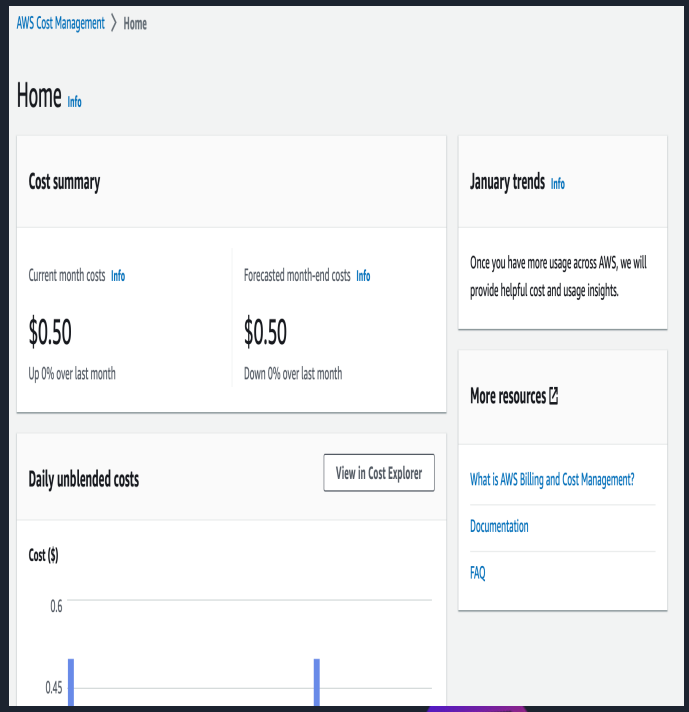
- What is S3?
  - Simple Storage Service
  - Object Storage
  - 99.99% availability
- Setup Budget
- Familiarize yourself with cost explorer

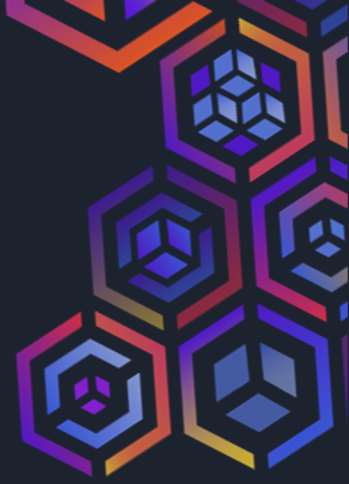
S3 Bucket

AWS Budget



AWS Cost Explorer





Steps for S3 Web Site Hosting

- Create S3 bucket for static contents
- Enable static web site hosting
- Upload site contents
- Organize html, CSS, image and other contents files
- Identify index and error pages.

See it in action!

- Create S3 bucket for static contents
- Enable static web site hosting
- Upload site contents
- Organize html, CSS, image and other contents files
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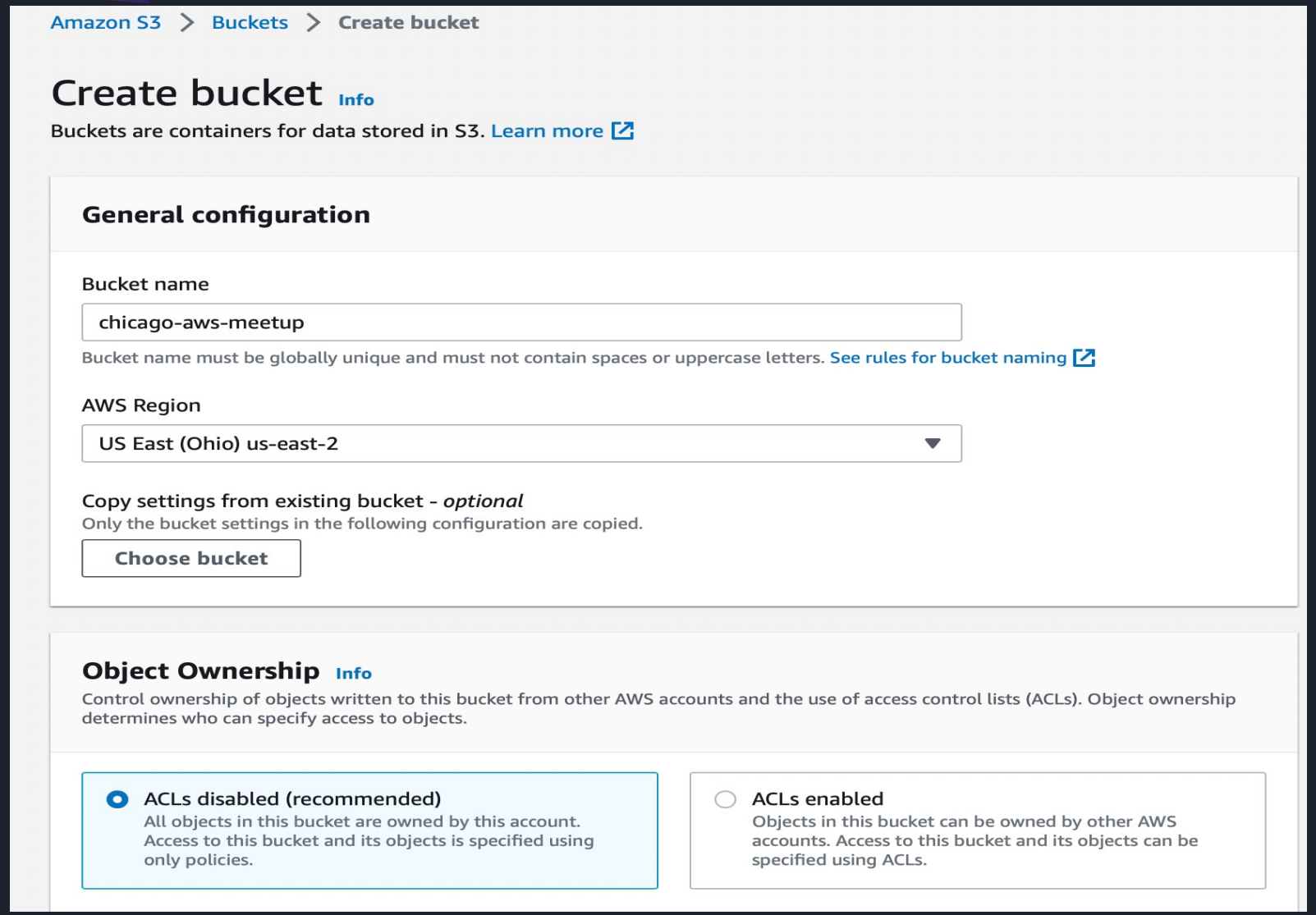

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Amazon S3 > Buckets > chicago-aws-meetup > Edit Block public access (bucket settings)

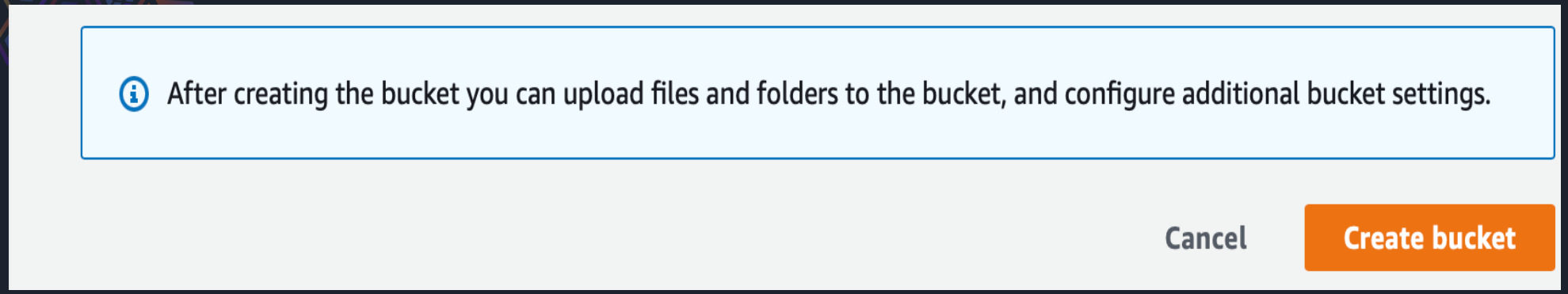
Edit Block public access (bucket settings) Info

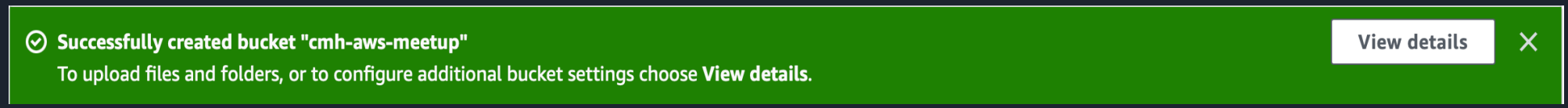
Block public access (bucket settings)

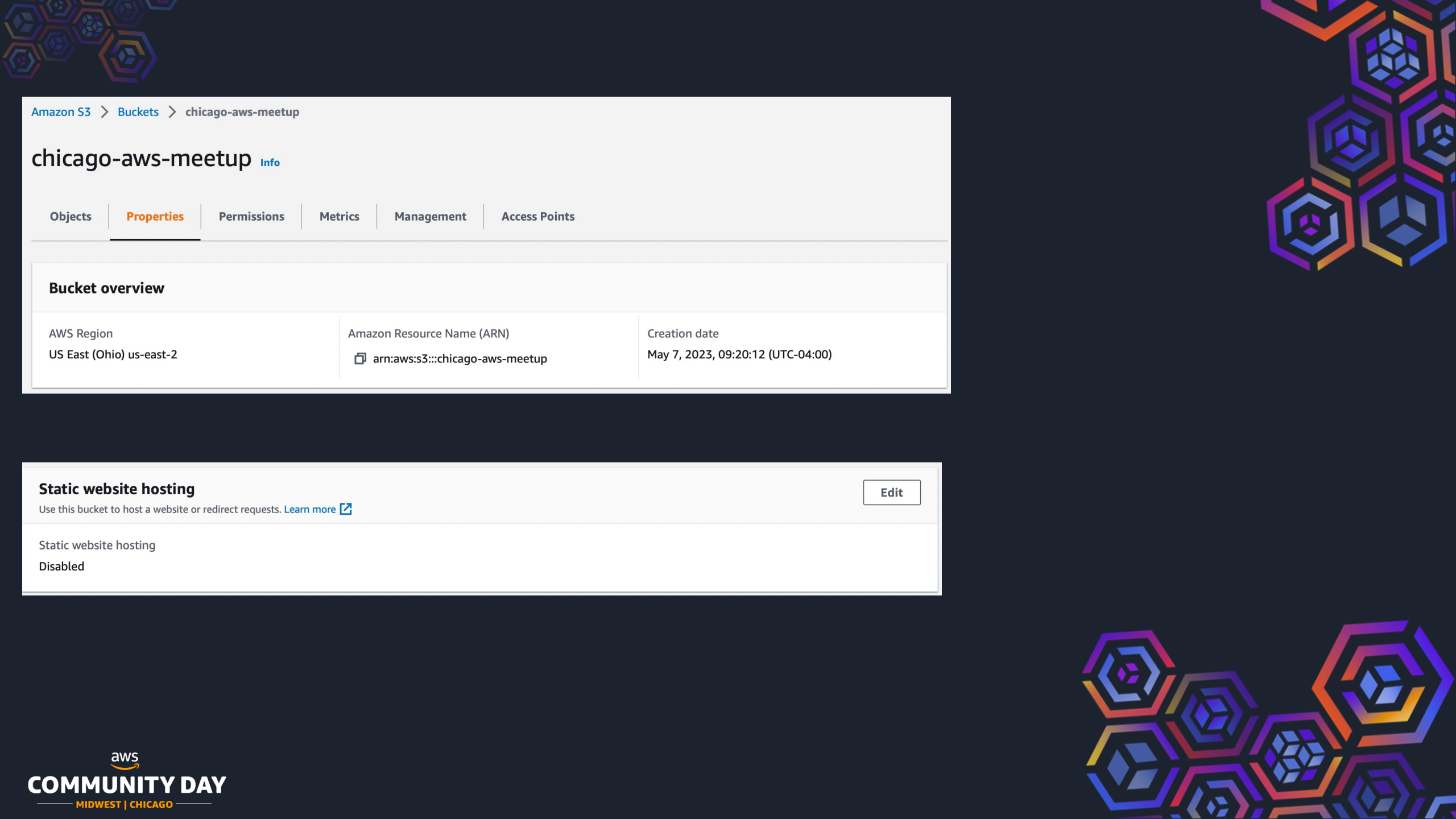
Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to all your S3 buckets and objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to your buckets or objects within, you can customize the individual settings below to suit your specific storage use cases. Learn more

- [ ] **Block *all* public access**
  Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.
  - [ ] **Block public access to buckets and objects granted through *new* access control lists (ACLs)**
    S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.
  - [ ] **Block public access to buckets and objects granted through *any* access control lists (ACLs)**
    S3 will ignore all ACLs that grant public access to buckets and objects.
  - [ ] **Block public access to buckets and objects granted through *new* public bucket or access point policies**
    S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.
  - [ ] **Block public and cross-account access to buckets and objects through *any* public bucket or access point policies**
    S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects.

Cancel Save changes


After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.
Cancel
Create bucket


Successfully created bucket "cmh-aws-meetup"
To upload files and folders, or to configure additional bucket settings choose View details.
View details



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Static website hosting

Use this bucket to host a website or redirect requests. Learn more

Static website hosting

- ○ Disable
- ◉ Enable

Hosting type

- ◉ Host a static website
  Use the bucket endpoint as the web address. Learn more
- ○ Redirect requests for an object
  Redirect requests to another bucket or domain. Learn more

> For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see Using Amazon S3 Block Public Access

Index document

Specify the home or default page of the website.

index.html

Error document - *optional*

This is returned when an error occurs.

error.html

Redirection rules – *optional*

Redirection rules, written in JSON, automatically redirect webpage requests for specific content. Learn more

Bucket website endpoint

When you configure your bucket as a static website, the website is available at the AWS Region-specific website endpoint of the bucket. Learn more

http://chicago-aws-meetup.s3-website.us-east-2.amazonaws.com

403 Forbidden

- Code: AccessDenied
- Message: Access Denied
- RequestId: 40R3NCNYTXQ9QA05
- HostId: q6AaR+0rkzQlLebua2vCMGKSUeZfBoiO2TF4It3KI4iUKA0yCm3hUt/hgC8OYiVCqgAoLYb4Yrc=

An Error Occurred While Attempting to Retrieve a Custom Error Document

- Code: AccessDenied
- Message: Access Denied

Bucket policy

The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by

Policy examples | Policy generator

Bucket ARN

arn:aws:s3:::chicago-aws-meetup

Policy

```
1  {
2      "Version": "2012-10-17",
3      "Statement": [
4          {
5              "Sid": "PublicReadGetObject",
6              "Effect": "Allow",
7              "Principal": "*",
8              "Action": [
9                  "s3:GetObject"
10             ],
11             "Resource": [
12                 "arn:aws:s3:::chicago-aws-meetup/*"
13             ]
14         }
15     ]
16 }
```

Hello Chicago AWS Meetup!!!

http://chicago-aws-meetup.s3-website.us-east-2.amazonaws.com

Hello Chicago AWS Meetup!!!

Got the website endpoint, what's next?

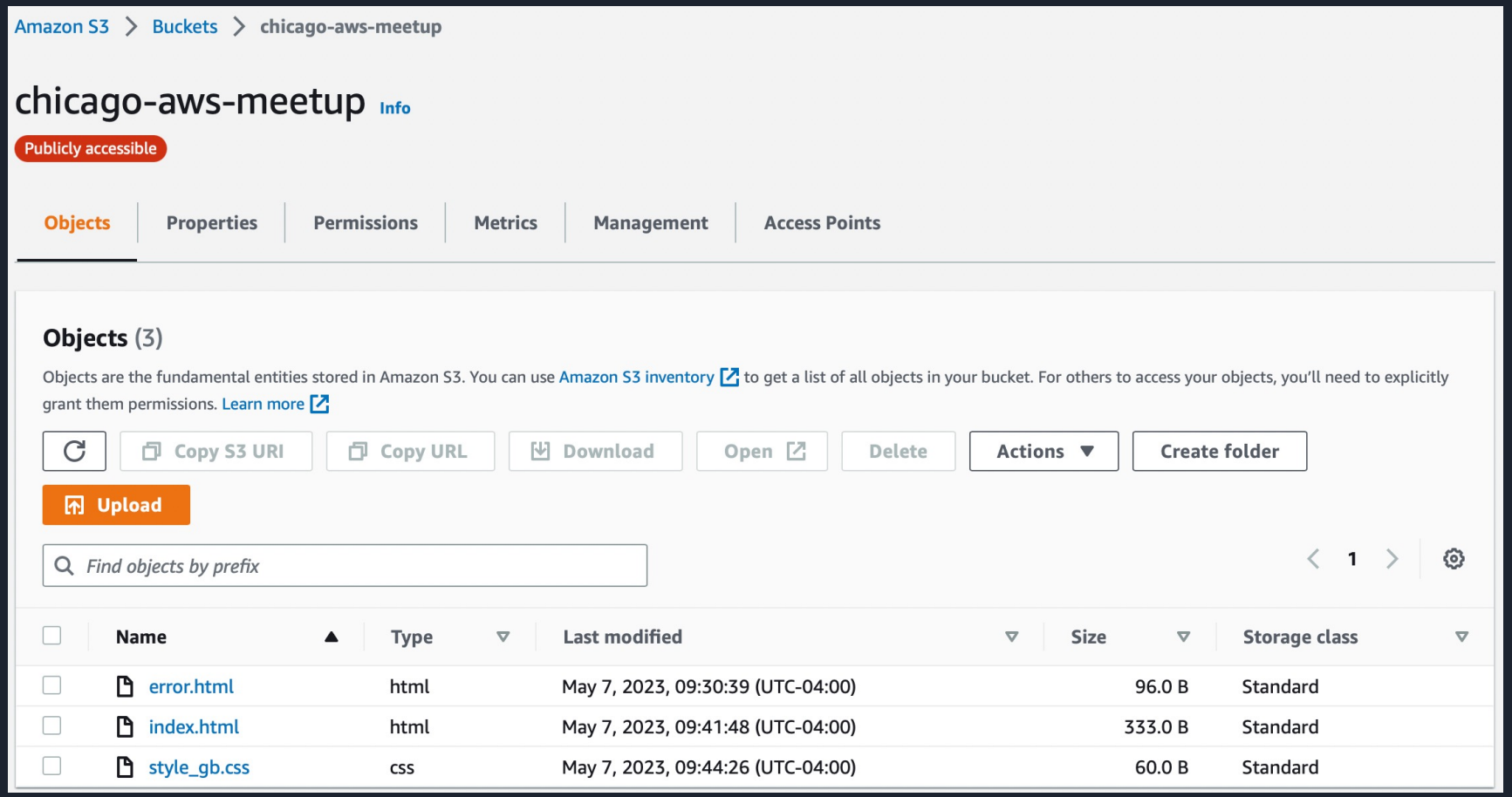
- Buy a Domain (use Route 53 or similar service)
- Configure S3 bucket end point for your domain. Configure CNAME entry
  - **Public Hosted Zones are meant to be used for people requesting your website through the Internet. Finally, NS records must be updated on the 3rd party Registrar.**
- Optional: Use ACM to generate SSL/TLS Certificate
  - Install certificate to enable HTTPS
  - Use CloudFront (you cannot use https/certificate directly with S3 static web site)

AWS Services used thus far:

- AWS Budget
- AWS Cost Explorer
- AWS S3
- AWS Route 53
- AWS ACM
- AWS CloudFront

Upload site contents - Multiple Way to upload contents

- Use AWS Console to load the contents
- Use IDE/AWS tools like VS Code. (this is my preferred way)
- Use CLI



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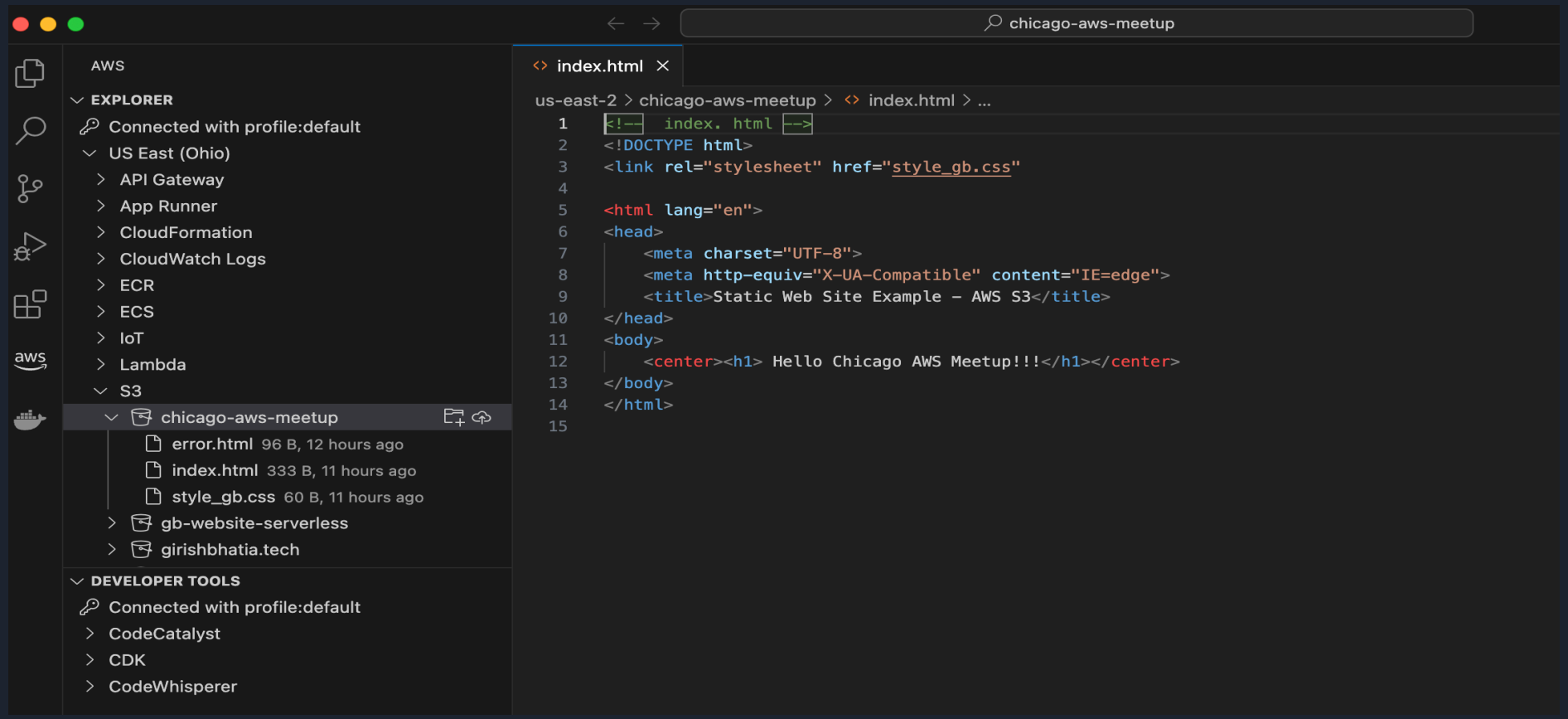
VS Code + AWS Toolkit Extension

- VS Code View
- Updating the content via VS Code
- Refresh the site

VS Code + AWS Toolkit Extension



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Backup your website code in your local folder

- CLI Command to backup/fetch contents to your local folder

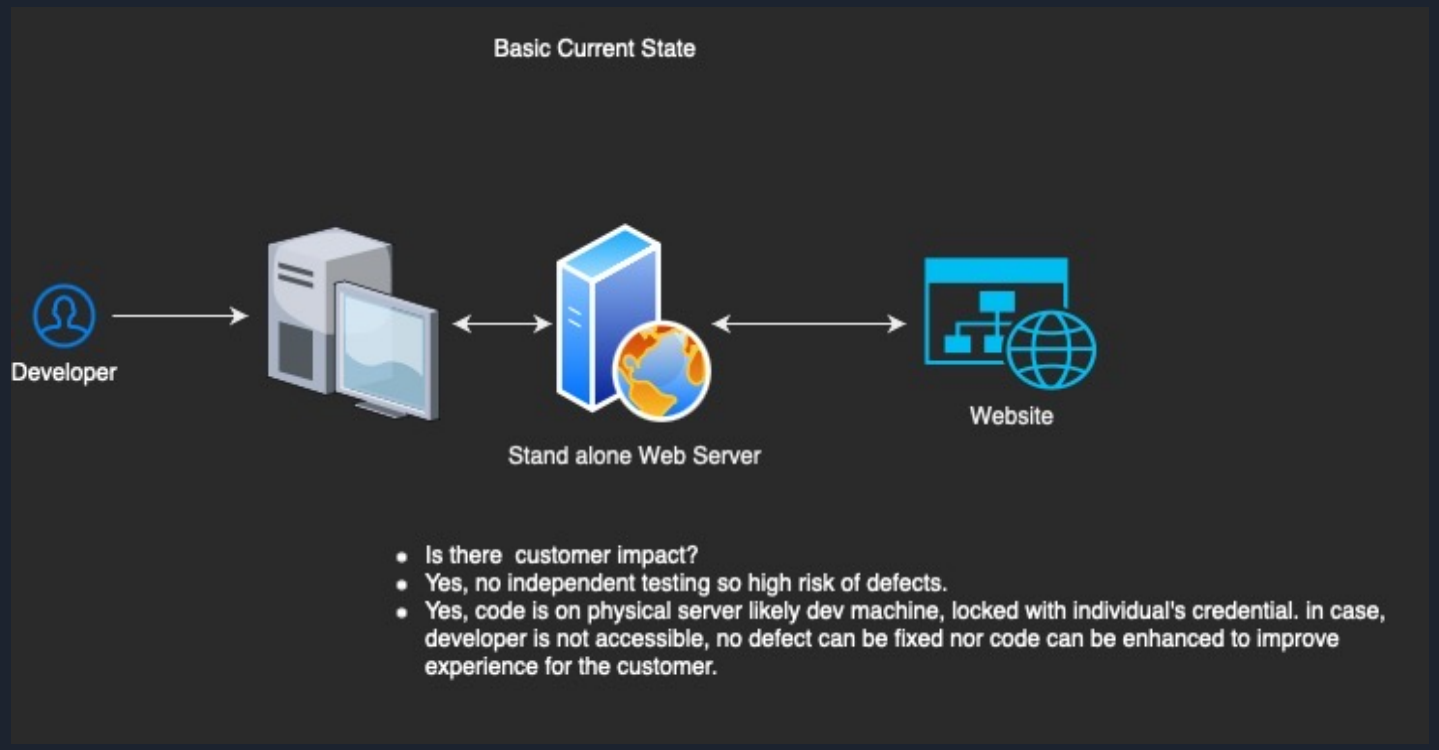
- aws s3 cp s3://chicago-aws-meetup/ ./ --recursive

CICD Pipeline

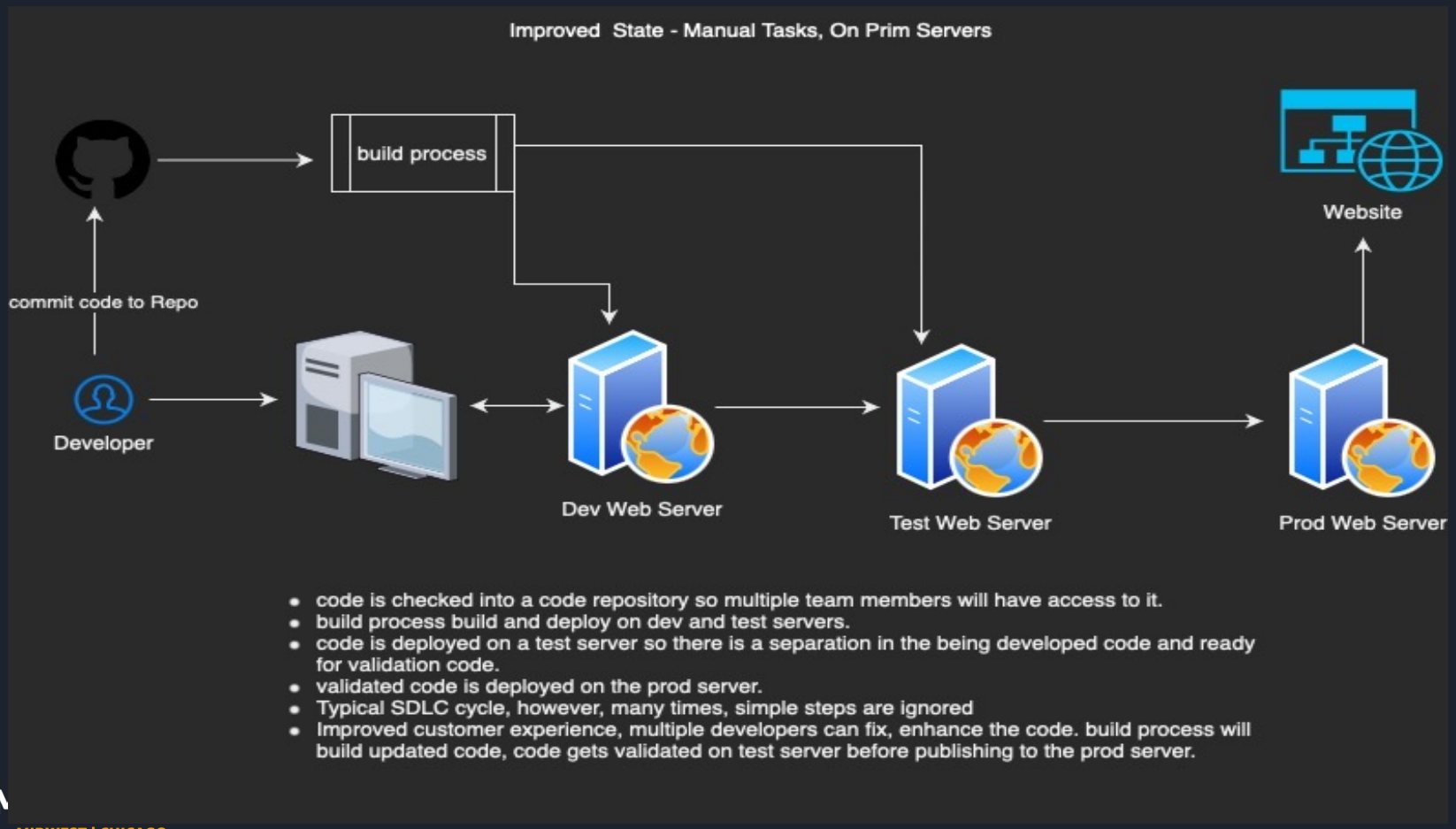
CICD Pipeline using GitHub

- VS Code + GitHub
- *AWS Code Commit*
- *AWS Code Build*
- AWS Code Deploy
- AWS Code Pipeline
- AWS S3

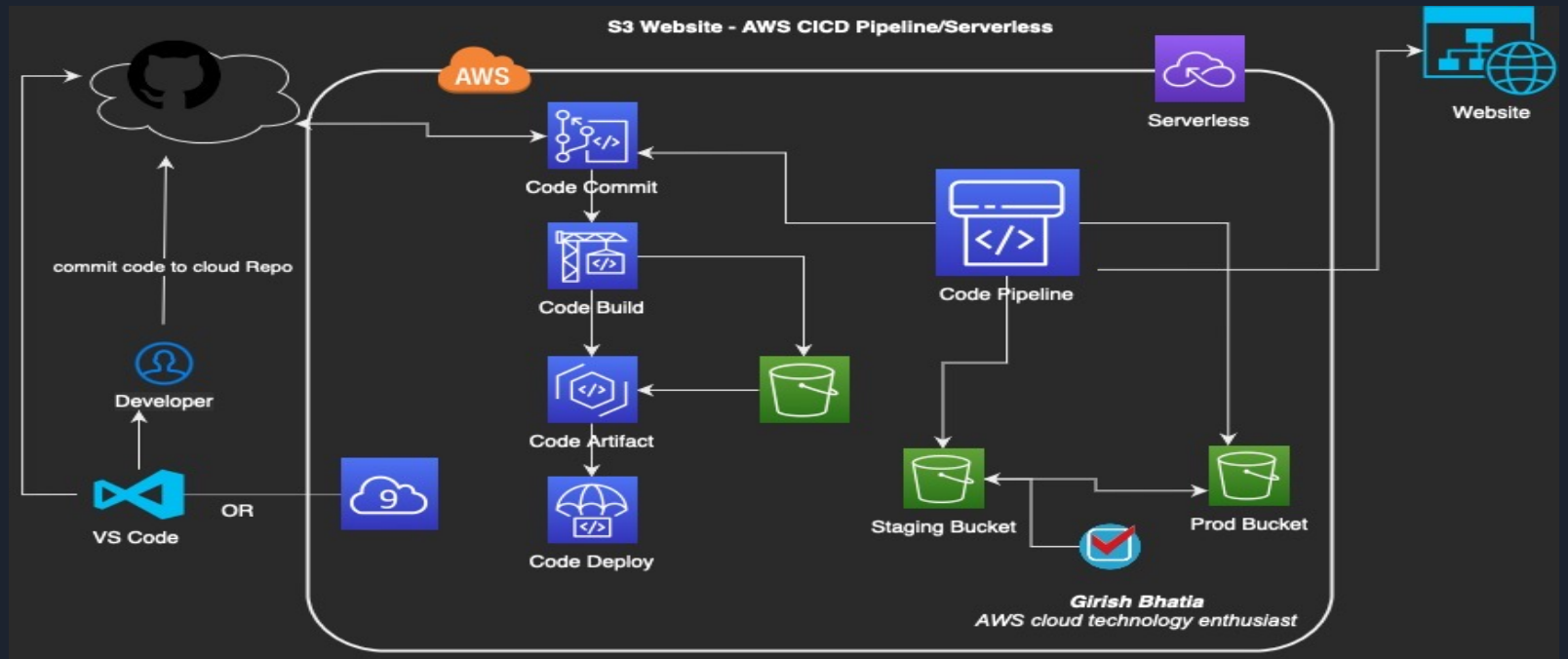
Current State: Basic Architecture (on prim)



Current State: Improved Architecture (on prim)



Future State: AWS Cloud enabled Architecture

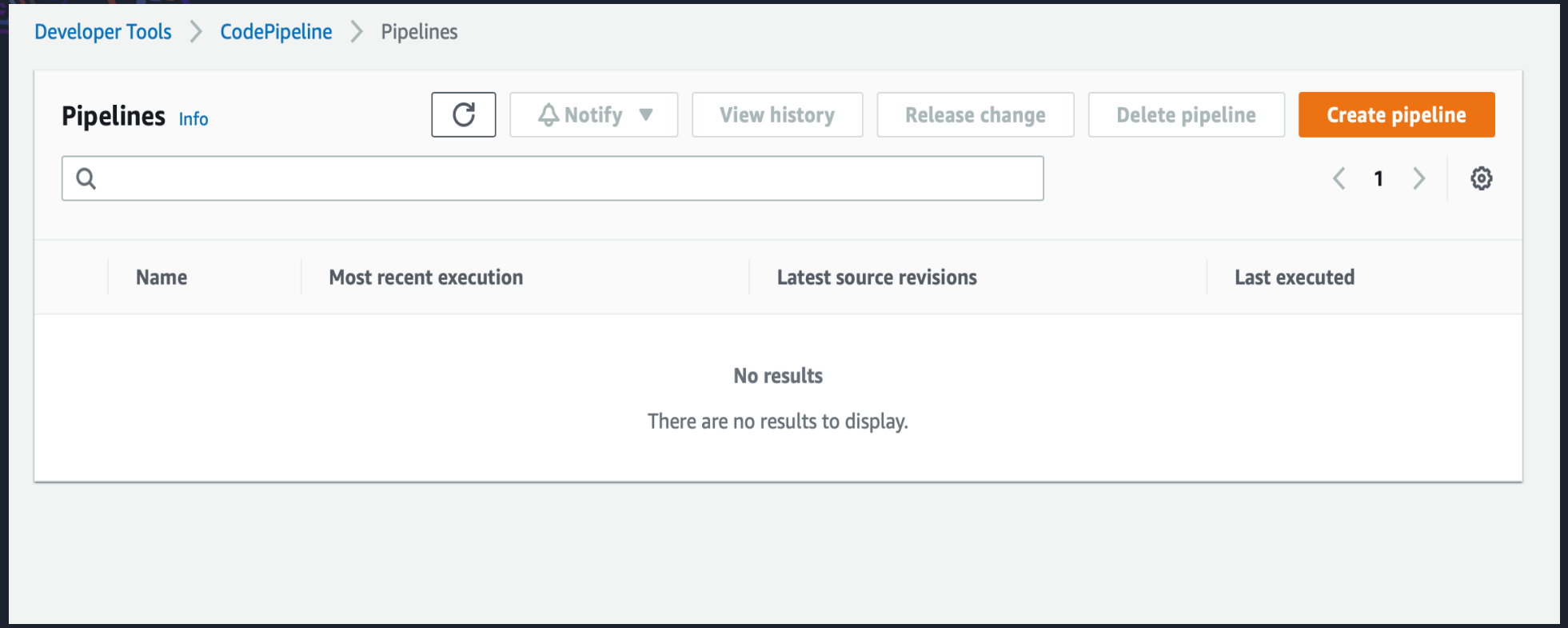


- VS code or Cloud9 IDE is used
- IDE is integrated with GitHub or Code Commit
- Code pipeline is built so that code is built and deploy every time developer commit a change to the repo.
- Code artifact is built and deploy in a staging S3 bucket.
- Manual review/approval task
- Once manual task is approved, code is promoted from staging bucket to prod bucket.
- revised website is published and live!
- All Serverless, No EC2 instance or on prim server!
- code guru service can be used for code review.

See it in action!

- Create Code Pipeline
- Commit change
- Push to GitHub
- Code Pipeline gets triggered and update S3 Bucket
- Updated website is published!

Create Code Pipeline



Create Code Pipeline

Choose pipeline settings Info

Pipeline settings

Pipeline name
Enter the pipeline name. You cannot edit the pipeline name after it is created.

chicago-aws-pipeline

No more than 100 characters

Service role

- (•) New service role
  Create a service role in your account
- ( ) Existing service role
  Choose an existing service role from your account

Role name

AWSCodePipelineServiceRole-us-east-2-chicago-aws-pipeline

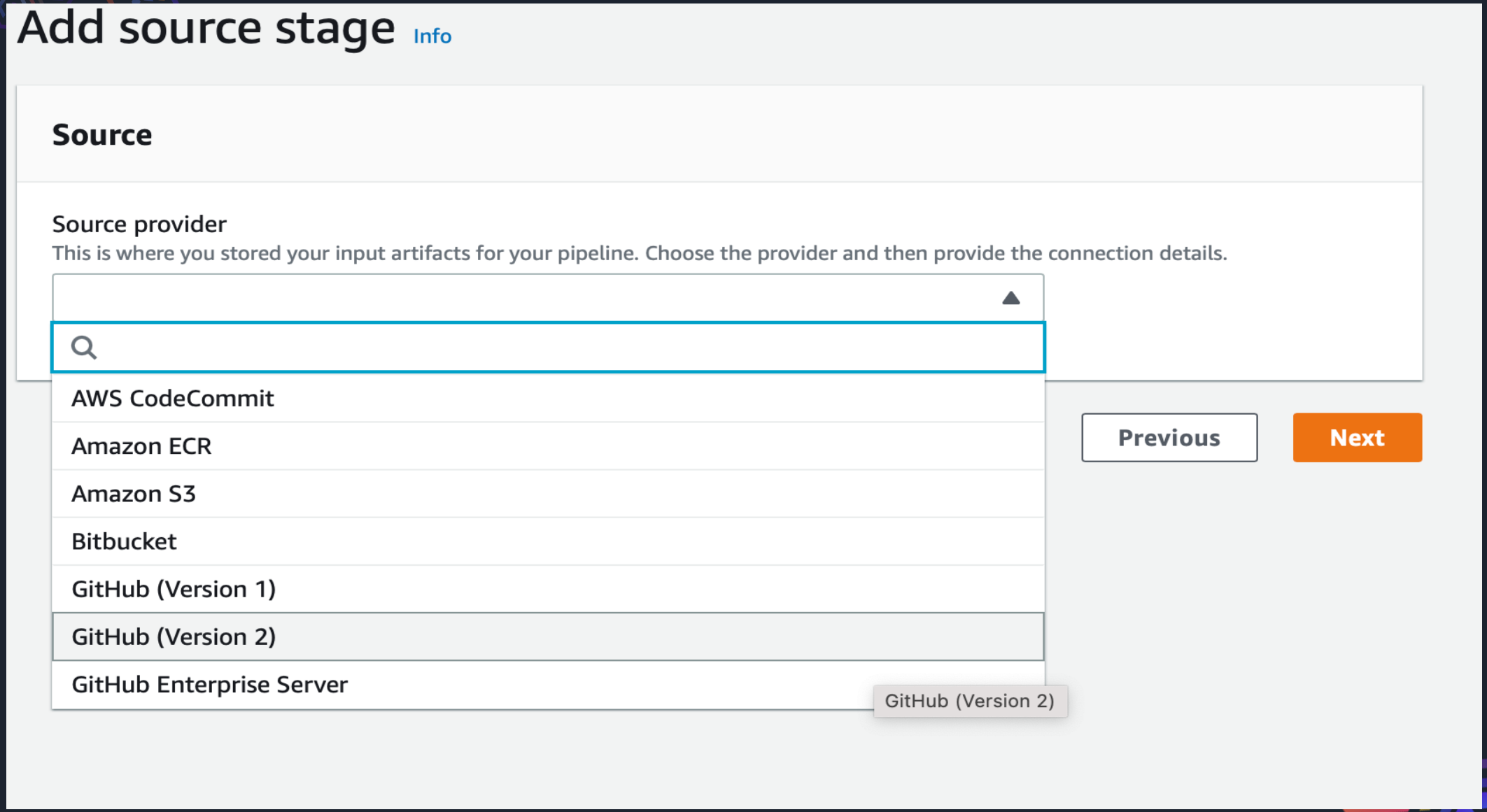
Type your service role name

[x] Allow AWS CodePipeline to create a service role so it can be used with this new pipeline

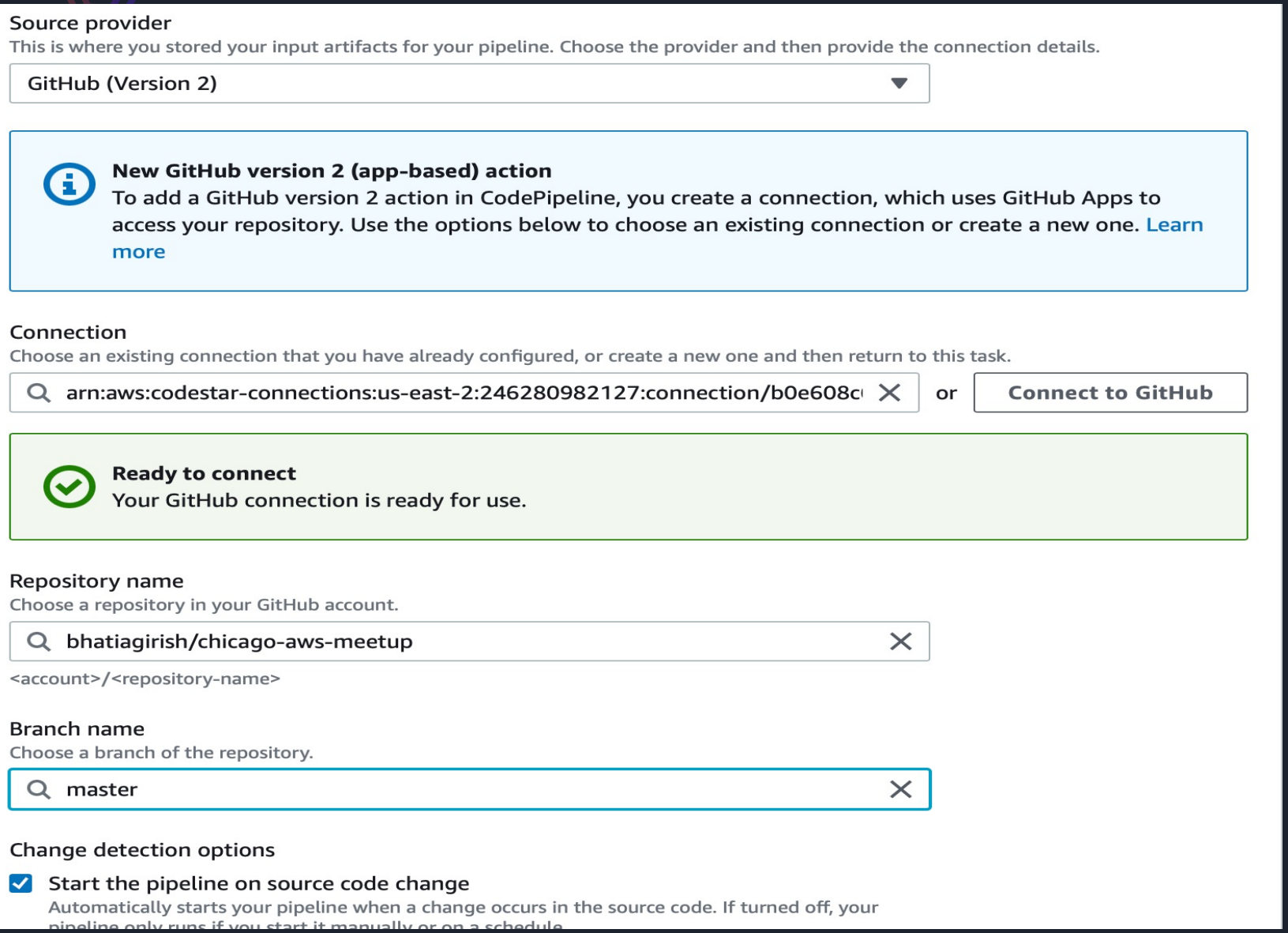
▶ Advanced settings

Cancel Next

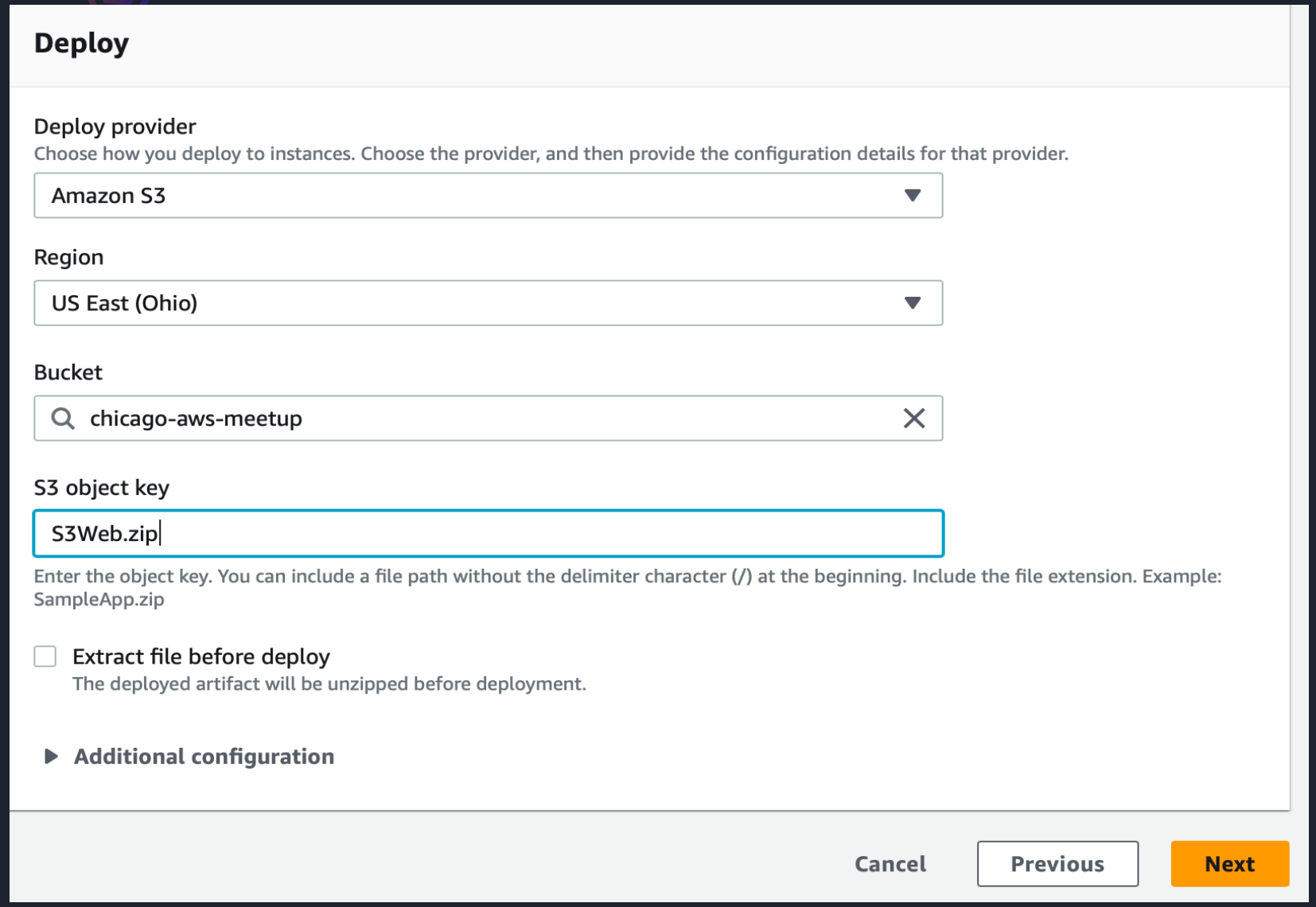
Add source Repo



Connect to GitHub



Code pipeline deploy stage



Code pipeline Review before creation

Pipeline settings

Pipeline name

chicago-aws-pipeline

Artifact location

A new Amazon S3 bucket will be created as the default artifact store for your pipeline

Service role name

AWSCodePipelineServiceRole-us-east-2-chicago-aws-pipeline

Step 2: Add source stage

Source action provider

Source action provider

GitHub (Version 2)

OutputArtifactFormat

CODE_ZIP

ConnectionArn

arn:aws:codestar-connections:us-east-2:246280982127:connection/b0e608c6-ed7c-405c-94c7-2b76722ed5aa

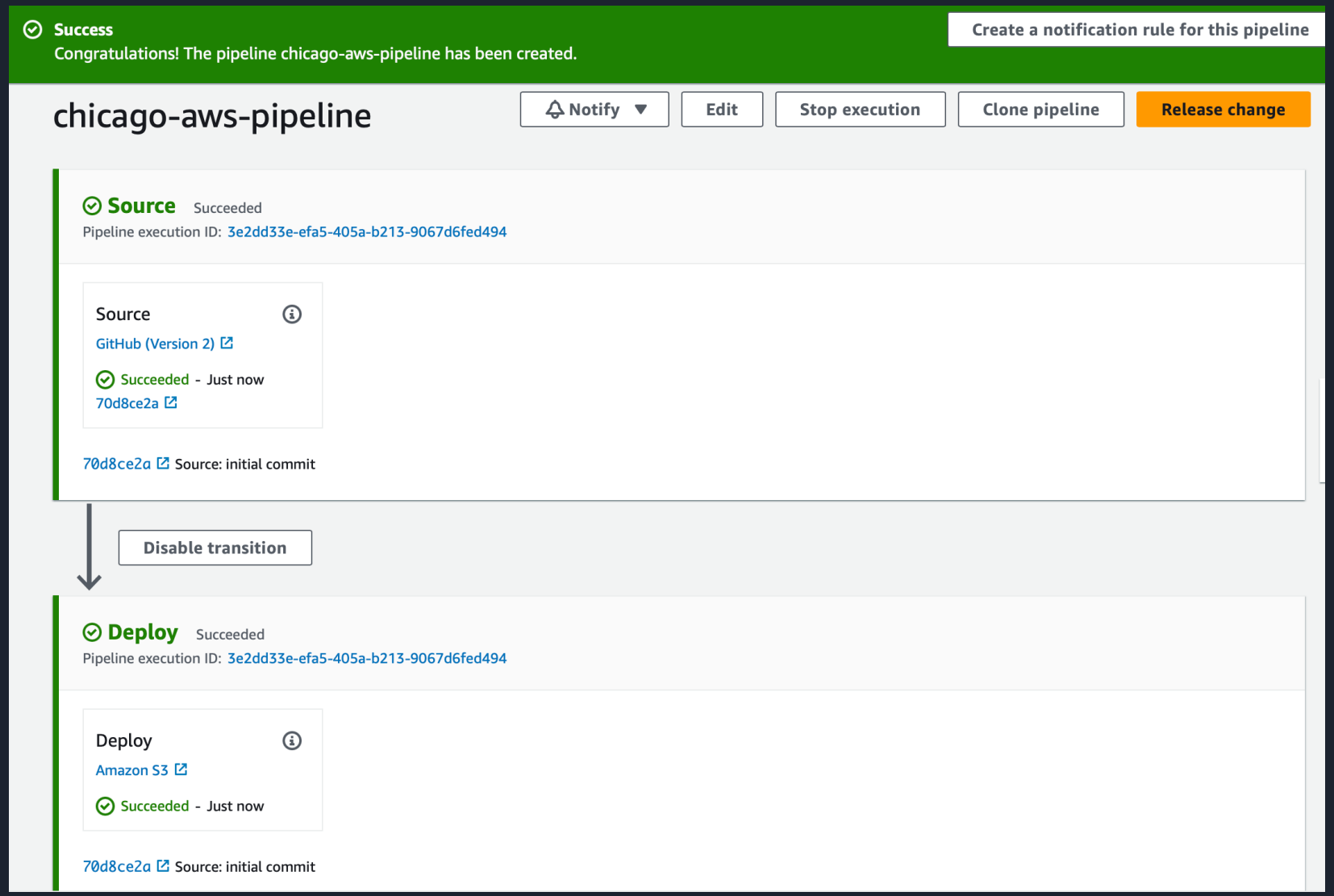
FullRepositoryId

bhatiagirish/chicago-aws-meetup

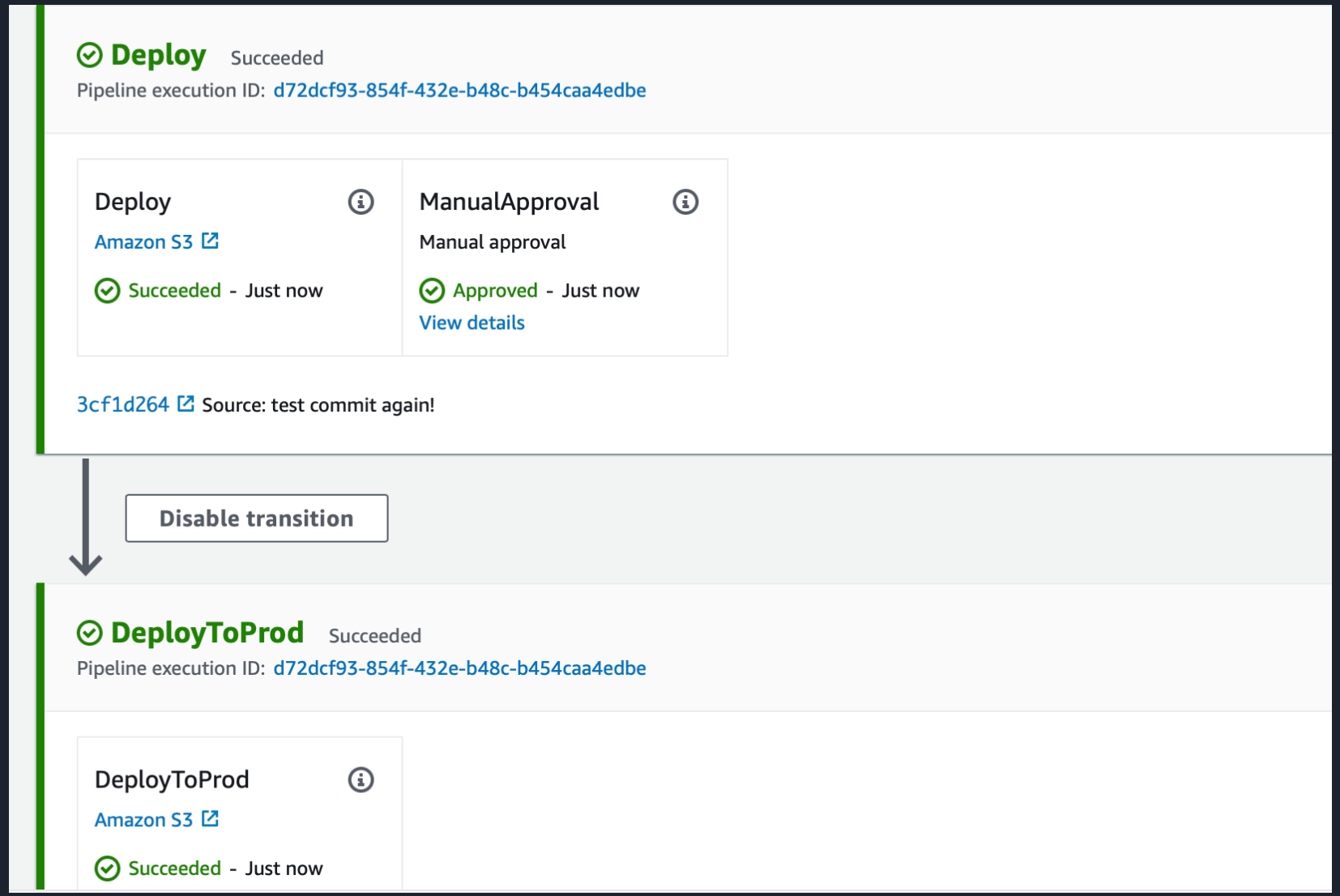
BranchName

master

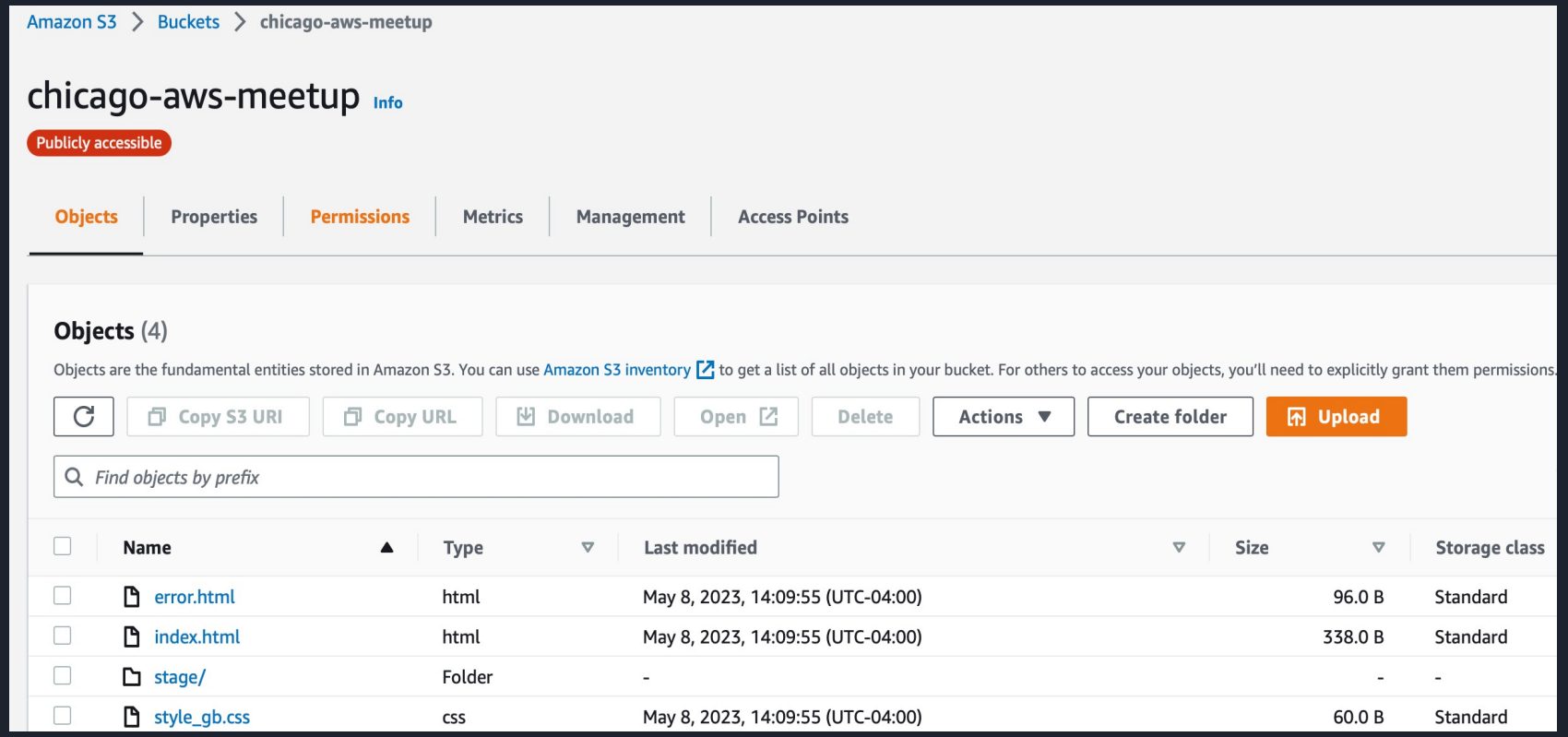
Code pipeline Created!



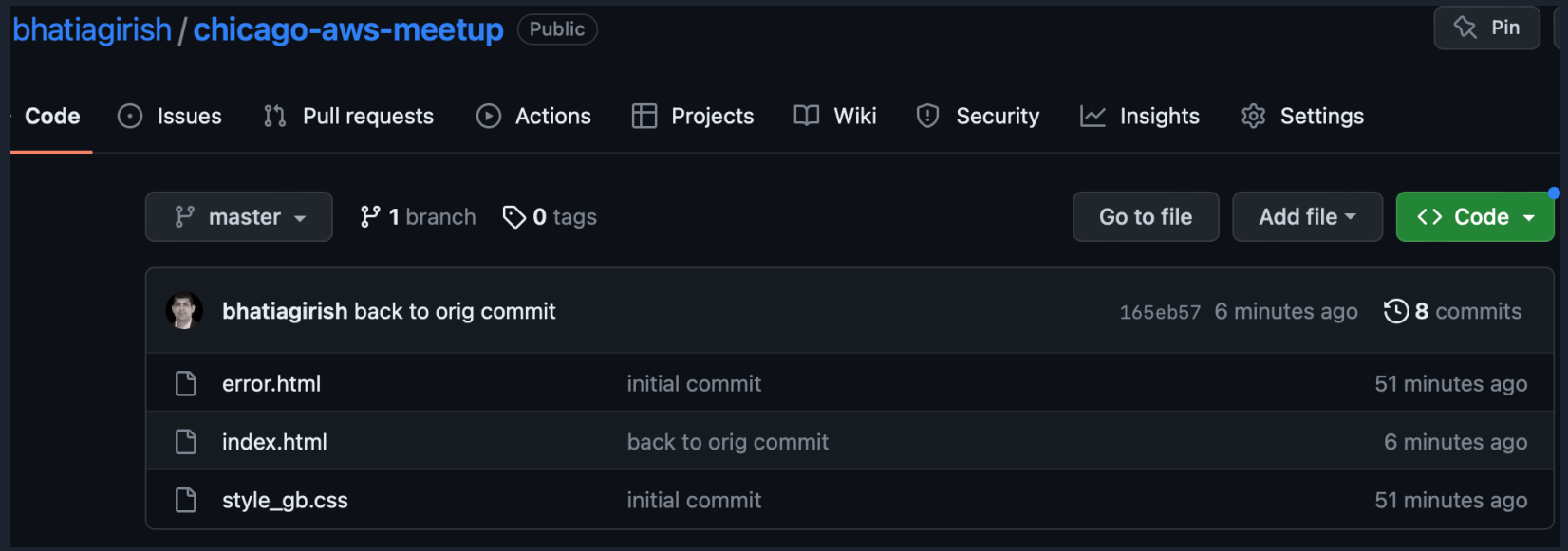
Code pipeline Manual Approval Action



S3 Bucket


Amazon S3 > Buckets > chicago-aws-meetup
chicago-aws-meetup Info
Publicly accessible
Objects
Properties
Permissions
Metrics
Management
Access Points
Objects (4)
Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions.
Copy S3 URI
Copy URL
Download
Open
Delete
Actions
Create folder
Upload
Find objects by prefix
Name
Type
Last modified
Size
Storage class
error.html
html
May 8, 2023, 14:09:55 (UTC-04:00)
96.0 B
Standard
index.html
html
May 8, 2023, 14:09:55 (UTC-04:00)
338.0 B
Standard
stage/
Folder
-
-
-
style_gb.css
css
May 8, 2023, 14:09:55 (UTC-04:00)
60.0 B
Standard

GitHub


bhatiagirish / chicago-aws-meetup
Public
Pin
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
master
1 branch
0 tags
Go to file
Add file
Code
bhatiagirish back to orig commit
165eb57 6 minutes ago
8 commits
error.html
initial commit
51 minutes ago
index.html
back to orig commit
6 minutes ago
style_gb.css
initial commit
51 minutes ago

AWS Services used:

- AWS Budget
- AWS Cost Explorer
- AWS S3
- AWS Route 53
- AWS ACM
- AWS CloudFront
- AWS Code Deploy
- AWS Code Pipeline
- VS Code
- GitHub

Thank you!

LinkedIn: https://www.linkedin.com/in/girishbhatia/
Website: http://girishbhatia.tech
Twitter: https://twitter.com/BhatiaGirish/

Code/slide available: GitHub