

# **Customer Attrition Forecasting (Banking Domain)**

**Rajagopal Anandan - 001**

**Nitish V.S. Ramakrishnan - 001**

**Meghana Vasanth Shettigar - 001**

**Ashutosh Kalsi - 001**

# ML CI/CD Pipeline Demo

# CodeCommit Repo

us-east-1.console.aws.amazon.com/codesuite/codecommit/repositories?region=us-east-1

aws Services Search [Option+S]

N. Virginia Rajagopal Anandan

Developer Tools **CodeCommit**

- Source • CodeCommit
  - Getting started
  - Repositories**
  - Approval rule templates
- Artifacts • CodeArtifact
- Build • CodeBuild
- Deploy • CodeDeploy
- Pipeline • CodePipeline
- Settings

Go to resource Feedback

Developer Tools > CodeCommit > Repositories

**Repositories** Info

Refresh Notify Clone URL View repository Delete repository Create repository

Search

< 1 > ⚙

	Name	Description	Last modified	Clone URL
<input type="radio"/>	churn-prediction	Repository contains churn prediction application	15 hours ago	<a href="#">HTTPS</a> <a href="#">SSH</a> <a href="#">HTTPS (GRC)</a>

# Code Migration to CC Repo

us-east-1.console.aws.amazon.com/codesuite/codecommit/repositories/churn-prediction/browse?region=us-east-1

Services Search [Option+S]

Developer Tools CodeCommit

Source • CodeCommit

- Getting started
- Repositories
- Code
- Pull requests
- Commits
- Branches
- Git tags
- Settings
- Approval rule templates

Artifacts • CodeArtifact

Build • CodeBuild

Deploy • CodeDeploy

Pipeline • CodePipeline

Settings

Go to resource

Feedback

Developer Tools > CodeCommit > Repositories > churn-prediction

## churn-prediction

Notify master Create pull request Clone URL

churn-prediction Info Add file

Name
FlaskApplication
TerraformApplication
.DS_Store
appspec.yaml
buildspec.yaml
Dockerfile
taskdef.json
terraform.tfstate

# Elastic Container Registry Repo

us-east-1.console.aws.amazon.com/ecr/repositories?region=us-east-1

Services Search [Option+S]

Amazon Elastic Container Registry

Private registry  
Public registry  
Repositories

Getting started  
Documentation  
Public gallery

Amazon ECR > Repositories

Private Public

Private repositories (1)

Find repositories

View push commands Delete Actions Create repository

	Repository name ▲	URI	Created at ▼	Tag immutability	Scan frequency	Encryption type	Pull-through cache
<input type="checkbox"/>	churn-application-repo	964597617122.dkr.ecr.us-east-1.amazonaws.com/churn-application-repo	30 April 2023, 01:27:11 (UTC-06)	Disabled	Scan on push	AES-256	Inactive

# CodeBuild Process

us-east-1.console.aws.amazon.com/codesuite/codebuild/projects?region=us-east-1&projects-meta=eyJmJp7InRleHQIOiIlC-JzaGFyZWQlOmZhbHNlSwicyl6eyJwcm9wZXJ0eSI6IkkxBU1RFTTU9ESUZJRURfVEINRSIsImRpcmVjdGlvbil6LTF9...

Developer Tools

CodeBuild

Source • CodeCommit

Artifacts • CodeArtifact

Build • CodeBuild

Getting started

Build projects

Build history

Report groups

Report history

Account metrics

Developer Tools > CodeBuild > Build projects

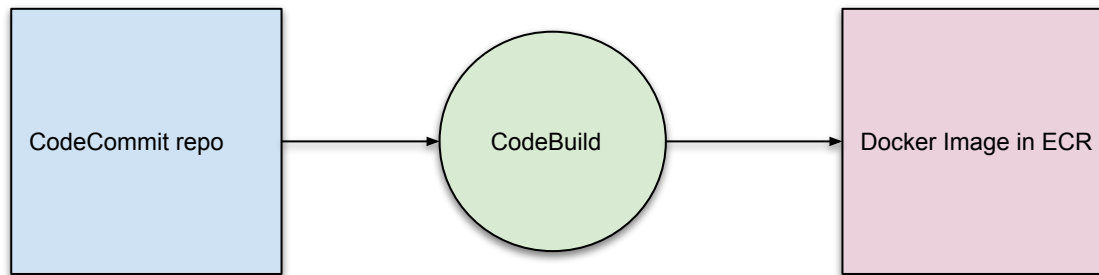
Build projects Info

Start build View details Edit Delete build project Create build project

Search

Your projects

Name	Source provider	Repository	Latest build status	Description	Last Modified
churn-application-build-project	AWS CodeCommit	churn-prediction	Succeeded	churn-application_codebuild_project	19 hours ago



# CodeBuild Process

us-east-1.console.aws.amazon.com/codesuite/codebuild/964597617122/projects/churn-application-build-project/history?region=us-east-1&builds-meta=eyJmJjI7InRleHQIOiIlIlFwcyYl6e30sm4iOjIwLCJpIjowfQ

Developer Tools

CodeBuild

Source • CodeCommit

Artifacts • CodeArtifact

Build • CodeBuild

Getting started

Build projects

Build project

Settings

Build history

Report groups

Report history

Account metrics

Deploy • CodeDeploy

Pipeline • CodePipeline

Settings

Go to resource

Feedback

churn-application-build-project

Notify Share Edit Delete build project Start build with overrides Start build

### Configuration

Source provider AWS CodeCommit	Primary repository churn-prediction	Artifacts upload location codepipeline-us-east-1-a	Build badge Disabled
Public builds Disabled			

Build history Batch history Build details Build triggers Metrics

### Build history

Stop build View artifacts View logs Delete builds Retry build

Build run	Status	Build number	Source version	Submitter	Duration	Completed
<input type="checkbox"/> churn-application-build-project:0d0a81d9-e1cc-4c0d-8c1d-3653e1579357	Succeeded	3	arn:aws:s3:::codepipeline-us-east-1-a/churn_pipeline/SourceArti/gnvwVHV	codepipeline/churn_pipeline	4 minutes 27 seconds	16 hours ago
<input type="checkbox"/> churn-application-build-project:3cb271c2-7bfe-4ac7-b38e-d754f6b411e6	Succeeded	2	arn:aws:s3:::codepipeline-us-east-1-a/churn_pipeline/SourceArti/69y5RV D	codepipeline/churn_pipeline	3 minutes 7 seconds	16 hours ago

# Docker Image in ECR Repo

us-east-1.console.aws.amazon.com/ecr/repositories/private/964597617122/churn-application-repo?region=us-east-1

Services Search [Option+S]

Amazon Elastic Container Registry

- Private registry
- Public registry
- Repositories
- Summary
- Images**
- Permissions
- Lifecycle Policy
- Repository tags

Getting started [?] Documentation [?] Public gallery [?]

Amazon ECR > Repositories > churn-application-repo

## churn-application-repo

View push commands Edit

Images (3) [Refresh] [Delete] [Details] [Scan]

Find images

<input type="checkbox"/>	Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest	Scan status	Vulnerabilities
<input type="checkbox"/>	2023-05-02, latest	Image	02 May 2023, 05:05:36 (UTC-06)	1125.80	Copy URI	sha256:dcacf4d90638a214b81f304de12d03...	Complete	1 Critical + 407 others (details)
<input type="checkbox"/>	<untagged>	Image	02 May 2023, 04:58:11 (UTC-06)	1125.80	Copy URI	sha256:382dc1c026467483e1d857981ba36...	Complete	1 Critical + 407 others (details)
<input type="checkbox"/>	<untagged>	Image	02 May 2023, 01:57:51 (UTC-06)	1125.80	Copy URI	sha256:83bb4028b148a6aac336c7346b373...	Complete	1 Critical + 407 others (details)



# Target Group

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#TargetGroup:targetGroupArn=arn:aws:elasticloadbalancing:us-east-1:964597617122:targetgroup/churn-application-group/c6939663f5d6156a

Services Search [Option+S]

Instances

- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Scheduled Instances
- Capacity Reservations

▼ Images

- AMIs
- AMI Catalog

▼ Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

▼ Network & Security

- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

▼ Load Balancing

- Load Balancers
- Target Groups

▼ Auto Scaling

- Launch Configurations

EC2 > Target groups > churn-application-group

## churn-application-group

Actions

**Details**

arn:aws:elasticloadbalancing:us-east-1:964597617122:targetgroup/churn-application-group/c6939663f5d6156a

Target type IP	Protocol : Port HTTP: 5000	Protocol version HTTP1	VPC vpc-078ca2eab9c3ec172
IP address type IPv4	Load balancer churn-load-balancer		

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
2	2	0	0	0	0

► **Distribution of targets by Availability Zone (AZ)**

Select values in this table to see corresponding filters applied to the Registered targets table below.

Targets | Monitoring | Health checks | Attributes | Tags

**Registered targets (2)**

Filter resources by property or value

	IP address	Port	Zone	Health status	Health status details
<input type="checkbox"/>	172.31.59.207	5000	us-east-1e	healthy	
<input type="checkbox"/>	172.31.13.174	5000	us-east-1d	healthy	

# Load Balancer

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LoadBalancers:loadBalancerArn=arn:aws:elasticloadbalancing:us-east-1:964597617122:loadbalancer/app/churn-load-balancer/f7140ec987090a03

churn-load-balancer

## Load balancers (1)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in demand.

Filter by property or value

<input type="checkbox"/>	Name	DNS name	State
<input type="checkbox"/>	churn-load-balancer	churn-load-balancer-7463...	Active

balancing-us-east-1:964597617122:loadbalancer/app/churn-load-balancer/f7140ec987090a03

DNS name  
churn-load-balancer-746309177.us-east-1.elb.amazonaws.com (A Record)

Scheme  
Internet-facing

Status  
Active

Availability Zones  
subnet-00c9bcb7a14f1b396 us-east-1e (use1-az3)  
subnet-0a074d6be4ea01da0 us-east-1c (use1-az6)  
subnet-09265dfbe13835049 us-east-1a (use1-az2)  
subnet-032aff34a77b9a30b us-east-1b (use1-az4)  
subnet-09e9e85489a3c4459 us-east-1f (use1-az5)  
subnet-04163f6711a7eeef7 us-east-1d (use1-az1)

Date created  
May 2, 2023, 02:03 (UTC-06:00)

Listeners (1)

A listener checks for connection requests on its port and protocol. Traffic received by the listener is routed according to its rules.

Search

<input type="checkbox"/>	Protocol:Port	Default action	Rules	ARN	Security policy	Default SSL cert
<input type="checkbox"/>	HTTP:80	Forward to target group <ul style="list-style-type: none"><li>churn-application-group: 1 (100%)</li><li>Group-level stickiness: Off</li></ul>	1 rule	ARN	Not applicable	Not applicable

# ECS Cluster

← → ↺

us-east-1.console.aws.amazon.com/ecs/v2/clusters/churn-application-cluster/tasks?region=us-east-1

🔍 Search [Option+S]

🔖 📌 ⚙️ 🗑️ 👤 N. Virginia ▾ Rajagopal Anandan ▾

New ECS Experience  
Tell us what you think

Amazon Elastic Container Service

Clusters

Namespaces [New](#)

Task definitions

Account settings [New](#)

Install AWS Copilot

Amazon ECR [Repositories](#)

AWS Batch

AWS Proton

Documentation [Discover products](#)

Subscriptions [Subscriptions](#)

Amazon Elastic Container Service > Clusters > churn-application-cluster > Tasks

churn-application-cluster

🔄 Update cluster Delete cluster

Cluster overview

ARN  
churn-application-cluster

Status  
Active

CloudWatch monitoring  
Default

Registered container instances  
-

Services  
Draining  
-

Active  
1

Tasks  
Pending  
-

Running  
2

Services Tasks Infrastructure Metrics Scheduled tasks Tags

Tasks (2)

🔄 Stop Run new task

🔍 Filter tasks by property or value Running tasks All launch types < 1 > ⚙️

<input type="checkbox"/>	Task	Last status	Desired st...	Task defi...	Revision	Health sta...	Started at	Container instan...	Launch t
<input type="checkbox"/>	1a22c50c35154d3494a964695726bc43	Running	Running	churn-appli...	9	Unknown	16 hours ago	-	FARGATE
<input type="checkbox"/>	feef30ee785f4166aa2a7fcd3c186013	Running	Running	churn-appli...	9	Unknown	16 hours ago	-	FARGATE

- Developer Tools
- CodePipeline
- Source • CodeCommit
  - Artifacts • CodeArtifact
  - Build • CodeBuild
  - Deploy • CodeDeploy
  - Pipeline • CodePipeline
    - Getting started
    - Pipelines
    - Pipeline
    - History
    - Settings
  - Settings
- Go to resource
- Feedback

Developer Tools > CodePipeline > Pipelines > churn\_pipeline

# churn\_pipeline

Notify Edit Stop execution Clone pipeline Release

Source Succeeded  
Pipeline execution ID: 1e9acdbc-631f-43cd-aec9-9ae4f36a8501

Source

AWS CodeCommit

Succeeded - 16 hours ago

d4c5ae82

d4c5ae82 Source: changes to file

Disable transition

Build Succeeded  
Pipeline execution ID: 1e9acdbc-631f-43cd-aec9-9ae4f36a8501

Build

AWS CodeBuild

Succeeded - 16 hours ago

Details

d4c5ae82 Source: changes to file

Disable transition

Deploy Succeeded  
Pipeline execution ID: 1e9acdbc-631f-43cd-aec9-9ae4f36a8501

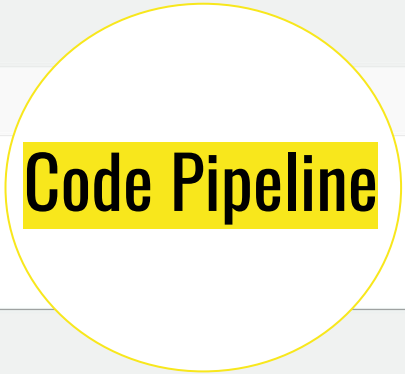
Deploy

Amazon ECS

Succeeded - 16 hours ago

Details

d4c5ae82 Source: changes to file



# S3 Buckets

← → ↺

s3.console.aws.amazon.com/s3/buckets?region=us-east-1&region=us-east-1

🏠 ☆ ⚙️ 📄 👤 A

aws

Services

🔍 Search

[Option+S]

📧 🔔 ⓘ Global ▾ Rajagopal Anandan ▾

Amazon S3

Buckets

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

IAM Access Analyzer for S3

Block Public Access settings for this account

Storage Lens

Dashboards

AWS Organizations settings

Feature spotlight

Amazon S3 > Buckets

► Account snapshot

Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

View Storage Lens dashboard

Buckets (5) [Info](#)

Buckets are containers for data stored in S3. [Learn more](#)

🔍 Find buckets by name

🔄

📋 Copy ARN

Empty

Delete

Create bucket

< 1 > ⚙️

	Name ▾	AWS Region ▾	Access ▾
<input type="radio"/>	codepipeline-us-east-1-a	US East (N. Virginia) us-east-1	<a href="#">Bucket and objects not public</a>
<input type="radio"/>	sagemaker-us-east-2-964597617122	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>
<input type="radio"/>	ramn	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>
<input type="radio"/>	sagemaker-us-west-2-964597617122	US West (Oregon) us-west-2	<a href="#">Bucket and objects not public</a>
<input type="radio"/>	sagemaker-studio-964597617122-3fbqve5y71v	US West (Oregon) us-west-2	<a href="#">Bucket and objects not public</a>

- Home
- Billing
- Bills
- Payments
- Credits
- Purchase orders
- Cost & usage reports
- Cost categories
- Cost allocation tags
- Free tier
- Billing Conductor
- Cost Management
- Cost explorer
- Budgets
- Budgets reports
- Savings Plans
- Preferences
- Billing preferences
- Payment preferences
- Consolidated billing
- Tax settings
- Permissions
- Affected policies

AWS Billing Dashboard

## AWS Billing Dashboard

Page refresh time: Wednesday, 3 May 2023 at 12:11:40 GMT-6

Unhide

### AWS summary

Current month's total forecast

USD 90.47

Total number of active services

15

Current MTD balance

USD 12.67

Total number of active AWS accounts

1

Prior month for the same period with trend

No data to display + 0.0%

Total number of active AWS Regions

5

### Highest account spend

Account name

Rajagopal Anandan

Trend compared to prior month

↓ 0.0%

Current MTD balance

USD 12.67

Prior month for the same period

No data to display

[View your bill](#)

### Highest AWS Region spend

Region name

US East (Ohio)

Trend compared to prior month

No data to display

Current MTD balance

USD 7.26

Prior month for the same period

No data to display

[View your bill](#)

### Account cost trend

Viewing data over a period of 3 months.

Line Last 3 months by account

Total cost in USD

0.04

0.03

0.02

0.01

0

Feb 2023

Mar 2023

Apr 2023

Rajagopal Anandan

AWS Anomaly Detection

AWS Cost Management

AWS Organizations