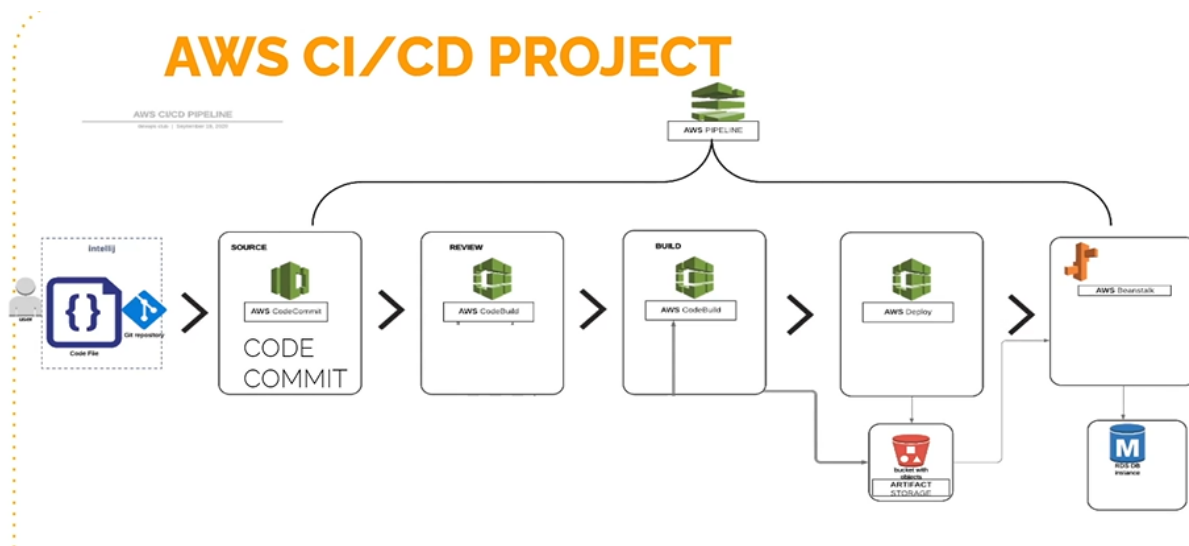


AWS CI/CD Project

This project demonstrates the AWS CI/CD pipeline from committing code to deploy the application in Elastic beanstalk. A pipeline is setup to consume the code from AWS Code commit (repository + branch – this is based on CloudWatch logs), build the code using Maven on AWS code build (build spec, db details are in application. Prop file) and the artifacts to be uploaded in the S3 Bucket. All logs will be streamed to CloudWatch logs. The next step in the pipeline is to deploy the application in elastic beanstalk. Whenever a code commit happened on AWS code commit, a new pipeline will get triggered.



1. Create an Elasticbeanstalk service

Modify instances

Root volume (boot device)

Root volume type

General Purpose (SSD)

Size

The number of gigabytes of the root volume attached to each instance.

8

GB

IOPS

Input/output operations per second for a provisioned IOPS (SSD) volume.

IOPS

Throughput

The desired throughput to provision for the Amazon EBS root volume attached to your environment's EC2 instance

MiB/s

Instance metadata service (IMDS)

Your environment's platform supports both IMDSv1 and IMDSv2. To enforce IMDSv2, disable IMDSv1. [Learn more](#)

Disable IMDSv1

With the current setting, the environment enables only IMDSv2.

☒ Disabled

EC2 security groups

	Group name	Group ID	Name
<input type="checkbox"/>	Ans_SG	sg-04ec08f2f36963c2f	-
<input type="checkbox"/>	CentOS 7 (x86_64) - with Updates HVM- CentOS-7.2009-20220825.1- AutogenByAWSMP--1	sg-0fff7dff5312bb93e	-

[Elastic Beanstalk](#) > Getting started

Modify capacity

Configure the compute capacity of your environment and auto scaling settings to optimize the number of instances used.

Auto scaling group

Environment type

Load balanced

Instances

Min

1

Max

2

Fleet composition

Choose a mix of On-Demand and Spot Instances with multiple instance types. Spot Instances are automatically launched at the lowest available price. [Learn more](#)

☒ On-Demand instances

☐ Combine purchase options and instances

Maximum spot price

recommend you include at least two instance types. [Learn more](#)

-- Choose instance types --

t2.micro X

AMI ID

ami-0d1b64d60913b0b4c

Availability Zones

Number of Availability Zones (AZs) to use.

Any 3

Placement

Specify Availability Zones (AZs) to use.

-- Choose Availability Zones (AZs) --

us-east-1a X us-east-1b X

us-east-1c X us-east-1d X

AWS Graviton now supported
AWS Graviton, an arm64-based processor, can offer up to 40% better price performance over the comparable x86 processor. To upgrade to an arm64 instance

Elastic Beanstalk > Getting started

Modify rolling updates and deployments

Application deployments

Choose how Amazon Elastic Beanstalk propagates source code changes and software configuration updates. [Learn more](#)

Deployment policy

Rolling

Batch size:

☒ Percentage

☐ Fixed

50 % of instances at a time

Traffic split

10 % to new application version

Traffic splitting evaluation time

5 minutes

Configuration updates

Changes to virtual machine settings and VPC configuration trigger rolling updates to replace the instances in your environment without downtime. [Learn more](#)

Rolling update type

Disabled

2. Create a key pair to use login ELB instance

aws

Services

Search

[Alt+S]

EC2 > Key pairs > Create key pair

Create key pair

Info

Key pair

A key pair, consisting of a private key and a public key, is a set of security credentials that you use to prove your identity when connecting to an instance.

Name

Elbkeypair

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

Info

☒ RSA

☐ ED25519

Private key file format

☒ .pem

For use with OpenSSH

☐ .ppk

For use with PuTTY

Tags - optional

No tags associated with the resource.

Add new tag

You can add up to 50 more tags.

Cancel

Create key pair

3. Create a RDS database

aws

Services

Q Search

[Alt+S]

We listened to your feedback!

Now, create a database with a single click using our pre-built configurations! Or choose your own configurations.

RDS > Create database

Create database


Choose a database creation method [Info](#)


☒ Standard create
You set all of the configuration options, including ones for availability, security, backups, and maintenance.


☐ Easy create
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.


Engine options


Engine type [Info](#)


☐ Amazon Aurora


☒ MySQL


☐ MariaDB


☐ PostgreSQL


☐ Oracle



☐ Microsoft SQL Server


Edition

☒ MySQL Community

Edition


☒ MySQL Community



Known issues/limitations
Review the [Known issues/limitations](#) to learn about potential compatibility issues with specific database versions.

Engine Version

MySQL 5.7.33



MySQL engine versions earlier than 8.0.17 don't support the newest m6g or r6g generation instance classes.

Templates

Choose a sample template to meet your use case.

☐ Production
Use defaults for high availability and fast, consistent performance.

☐ Dev/Test
This instance is intended for development use outside of a production environment.

☒ Free tier
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS.
[Info](#)

DB instance identifier [Info](#)

Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username [Info](#)

Type a login ID for the master user of your DB instance.

1 to 16 alphanumeric characters. First character must be a letter.

☒ Auto generate a password

Amazon RDS can generate a password for you, or you can specify your own password.

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

- ☐ Standard classes (includes m classes)
- ☐ Memory optimized classes (includes r and x classes)
- ☒ Burstable classes (includes t classes)

1 vCPUs 1 GiB RAM Not EBS Optimized

☐ Include previous generation classes

Storage

Storage type [Info](#)

Baseline performance determined by volume size

Allocated storage

Public access [Info](#)

- ☐ Yes
RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
- ☒ No
RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) [Info](#)

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

☐ Choose existing
Choose existing VPC security groups

☒ Create new
Create new VPC security group

New VPC security group name

satzprofile-bean-rds-sg

Availability Zone [Info](#)

No preference ▼

RDS Proxy

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

- ☐ Create an RDS Proxy [Info](#)
RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

▼ Additional configuration

Database port [Info](#)

TCP/IP port that the database will use for application connections.

3306

▼ Additional configuration

Database options, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Database options

Initial database name [Info](#)

accounts

If you do not specify a database name, Amazon RDS does not create a database.

DB parameter group [Info](#)

default.mysql5.7 ▼

Option group [Info](#)

default:mysql-5-7 ▼

Backup

- ☒ Enable automated backups
Creates a point-in-time snapshot of your database

Make sure to Store the credentials

- Make sure to remove the inbound rule, that allow 22 traffic from anywhere. And allow only your

- Now edit the inbound rule of RDS security group, and add ELB instance security group.

EC2 > Security Groups > sg-0ed06ab7e775d6d7e - satzprofile-bean-rds-sg > Edit inbound rules

Edit inbound rules

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules

sg-0ed06ab7e775d6d7e

Security group rule ID

sg-0a772c2356ca359e

Type

MySQL/Aurora

Protocol

TCP

Port range

3306

Source

Custom

Description - optional

CL

sg-048bce1688bc3738

X

Add rule

Cancel

Preview changes

Save rules

- We are logging to an instance, download the code from git, and connect to the RDS instance..

Can use any instance in the same VPC. It is not required to do it in ELB instance.

```

satzw@LAPTOP-C4RG1671 MINGW64 ~/Downloads
$ ssh -i Elbkeypair.pem ec2-user@100.26.47.220
ElasticBeanstalk
Amazon Linux 2 AMI

This EC2 instance is managed by AWS Elastic Beanstalk. Changes made via SSH
WILL BE LOST if the instance is replaced by auto-scaling. For more information
on customizing your Elastic Beanstalk environment, see our documentation here:
http://docs.aws.amazon.com/elasticbeanstalk/latest/dg/customize-containers-ec2.
html

[ec2-user@ip-172-31-31-138 ~]$

```


Become root and install git, mysql

```
http://docs.aws.amazon.com/elasticbeanstalk/latest/dg/customize-containers-ec2.html
[ec2-user@ip-172-31-31-138 ~]$ sudo -i
[root@ip-172-31-31-138 ~]# yum install git mysql -y
```

Clone the repo,

```
Complete!
[root@ip-172-31-31-138 ~]# git clone https://github.com/devopshydc1ub/vprofile-repo.git
```

```
Complete!
[root@ip-172-31-31-138 ~]# git clone https://github.com/devopshydc1ub/vprofile-repo.git
Cloning into 'vprofile-repo'...
remote: Enumerating objects: 1707, done.
remote: Counting objects: 100% (213/213), done.
remote: Compressing objects: 100% (70/70), done.
remote: Total 1707 (delta 176), reused 143 (delta 143), pack-reused 1494
Receiving objects: 100% (1707/1707), 42.34 MiB | 27.54 MiB/s, done.
Resolving deltas: 100% (615/615), done.
[root@ip-172-31-31-138 ~]# cd vprofile-repo/
[root@ip-172-31-31-138 vprofile-repo]# ls
ansible      Jenkinsfile  README.md   tomcat-setup.sh
context.xml  pom.xml      src          tomcat-users.xml
[root@ip-172-31-31-138 vprofile-repo]# git checkout vp-rem
branch 'vp-rem' set up to track 'origin/vp-rem'.
Switched to a new branch 'vp-rem'
[root@ip-172-31-31-138 vprofile-repo]# ls src/main/resources/db_backup.sql
src/main/resources/db_backup.sql
[root@ip-172-31-31-138 vprofile-repo]#
```

Now connect to the RDS instance,

```
[root@ip-172-31-31-138 vprofile-repo]# mysql -h vprofile-bean-rds.cs20txafmaa.ue
s-east-1.rds.amazonaws.com -u admin -pQzYcEtyLG7aq3rzzFJw accounts
ERROR 1045 (28000): Access denied for user 'admin'@'172.31.31.138' (using passwo
rd: YES)
[root@ip-172-31-31-138 vprofile-repo]# mysql -h vprofile-bean-rds.cs20txafmaa.ue
s-east-1.rds.amazonaws.com -u admin -pQzYcEtyLG7aq3rzzFJw accounts
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 27
Server version: 5.7.33-log Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

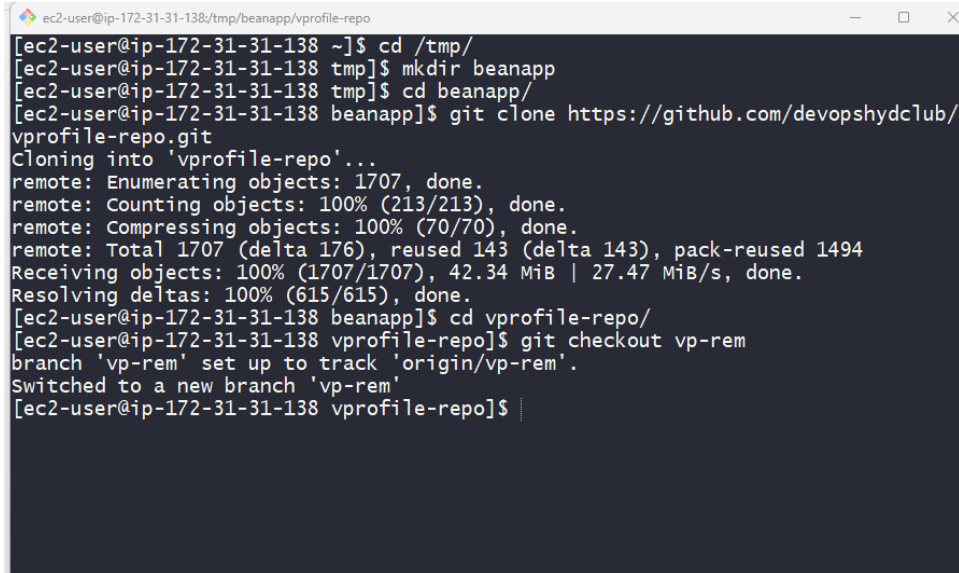
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [accounts]>
```

8.. Deploy Schemas

```
[root@ip-172-31-31-138 vprofile-repo]# mysql -h vprofile-bean-rds.cs20txafmaa.us-east-1.rds.amazonaws.com -u admin -pQtZyCetyLG7aq3rzzFJw accounts < src/main/resources/db_backup.sql
```

Logout and now go to the ec2-instance.

A terminal window titled 'ec2-user@ip-172-31-31-138/tmp/beanapp/vprofile-repo' with standard window controls. The terminal shows a series of commands and their outputs. The user navigates to the /tmp directory, creates a 'beanapp' directory, and enters it. Then, they clone a repository from GitHub. The output shows progress for enumerating, counting, and compressing objects, followed by receiving and resolving deltas. Finally, they checkout to a branch named 'vp-rem', which is set up to track 'origin/vp-rem'.

```
ec2-user@ip-172-31-31-138 ~]$ cd /tmp/
[ec2-user@ip-172-31-31-138 tmp]$ mkdir beanapp
[ec2-user@ip-172-31-31-138 tmp]$ cd beanapp/
[ec2-user@ip-172-31-31-138 beanapp]$ git clone https://github.com/devopshydc1ub/vprofile-repo.git
Cloning into 'vprofile-repo'...
remote: Enumerating objects: 1707, done.
remote: Counting objects: 100% (213/213), done.
remote: Compressing objects: 100% (70/70), done.
remote: Total 1707 (delta 176), reused 143 (delta 143), pack-reused 1494
Receiving objects: 100% (1707/1707), 42.34 MiB | 27.47 MiB/s, done.
Resolving deltas: 100% (615/615), done.
[ec2-user@ip-172-31-31-138 beanapp]$ cd vprofile-repo/
[ec2-user@ip-172-31-31-138 vprofile-repo]$ git checkout vp-rem
branch 'vp-rem' set up to track 'origin/vp-rem'.
Switched to a new branch 'vp-rem'
[ec2-user@ip-172-31-31-138 vprofile-repo]$
```

9. Get into the src/main/resources/application.properties

```
ec2-user@ip-172-31-31-138:/tmp/beanapp/vprofile-repo
#JDBC Configuration for Database Connection
jdbc.driverClassName=com.mysql.jdbc.Driver
jdbc.url=jdbc:mysql://db01:3306/accounts?useUnicode=true&characterEncoding=UTF-8
&zeroDateTimeBehavior=convertToNull
jdbc.username=admin
jdbc.password=admin123

#Memcached Configuration For Active and StandBy Host
#For Active Host
memcached.active.host=mc01
memcached.active.port=11211
#For StandBy Host
memcached.standBy.host=127.0.0.2
memcached.standBy.port=11211

#RabbitMq Configuration
rabbitmq.address=rmq01
rabbitmq.port=5672
rabbitmq.username=test
rabbitmq.password=test

#Elasticsearch Configuration
elasticsearch.host =192.168.1.85
-- INSERT --
```

10. Update the RDS url, username and password,

```
#JDBC Configuration for Database Connection
jdbc.driverClassName=com.mysql.jdbc.Driver
jdbc.url=jdbc:mysql://vprofile-bean-rds.cs20txafmaaq.us-east-1.rds.amazonaws.com:3306/accounts?useUnicode=true&characterEncoding=UTF-8&zeroDateTimeBehavior=convertToNull
jdbc.username=admin
jdbc.password=tQzYcEtyLG7aq3rzzFJw

#Memcached Configuration For Active and StandBy Host
#For Active Host
memcached.active.host=mc01
memcached.active.port=11211
#For StandBy Host
memcached.standBy.host=127.0.0.2
memcached.standBy.port=11211

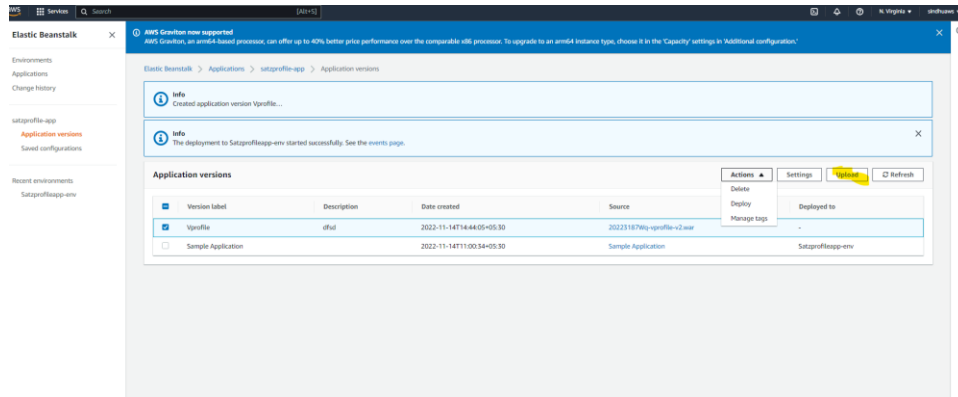
#RabbitMq Configuration
rabbitmq.address=rmq01
rabbitmq.port=5672
rabbitmq.username=test
rabbitmq.password=test

#Elasticsearch Configuration
-- INSERT --
```

11. Install maven on the machine with root, refer

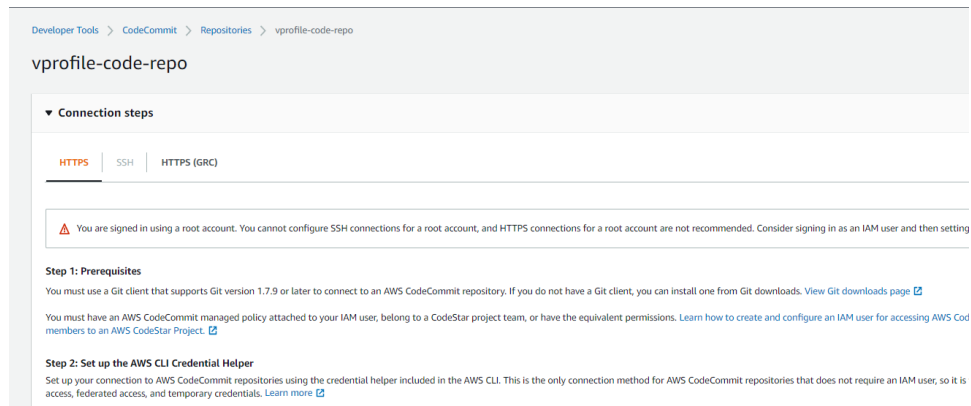
<https://docs.aws.amazon.com/neptune/latest/userguide/iam-auth-connect-prerq.html>

12. Download the war file to desktop, Now go to ELB and upload the artifacts, then deploy it to the environments,



13. Code Commit:

Create a code commit repository



14. Create a new user with AWSCODECOMMIT full access assigned to only the repository

Users > satzcode

Summary

User ARN	arn:aws:iam::224777171125:user/satzcode 🔗
Path	/
Creation time	2022-11-14 14:57 UTC+0530

Permissions Groups Tags **Security credentials** Access Advisor

Sign-in credentials

Summary • User does not have console management access

15. Generate ssh-keygen,

```
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ec2-user/.ssh/id_rsa): /home/ec2-user/.ssh/vpro-codecommit_rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ec2-user/.ssh/vpro-codecommit_rsa.
Your public key has been saved in /home/ec2-user/.ssh/vpro-codecommit_rsa.pub.
The key fingerprint is:
SHA256:nauhdv/joJARCILVjuzUh911bPTRktF+s24VwFp7dvU ec2-user@ip-172-31-31-138.ec2.internal
The key's randomart image is:
+---[RSA 2048]---+
|o . . . .o|
|.. . . .+=|
| . . . .++o|
```

15. Create a config file with the below information under .ssh directory,

```
ec2-user@ip-172-31-31-138:~/.ssh
Host git-codecommit.*.amazonaws.com
  User APKATIVODOC23LLNJW3F
  IdentityFile ~/.ssh/vpro-codecommit_rsa
~
~
```

From terminal using below cmd, we can validate the connectivity to Code commit repo

ssh -v git-codecommit.us-east-2.amazonaws.com

Now update the remote repo url in your local file,

Cat .git/config

Now get the list of branches in the folder,

Git branch -a | grep -v HEAD | cut -d '/' -f3 | grep -v master > /tmp/branches

//To check out all the branches in git

for i in `cat /tmp/branches` ` do git checkout \$i; done

// remove the old remote origin

git remote rm origin

//To add the new origin

git remote add origin ssh://git-codecommit.us-east-1.amazonaws.com/v1/repos/vprofile-code-repo

// git push to push all the branches on code commit repo.

git push origin -all

// To push all the tags,

Git push -tags

16. Create a new build in CodeCommit,

Create build project

Project configuration

Project name

satzbuid

A project name must be 2 to 255 characters. It can include the letters A-Z and a-z, the numbers 0-9, and the special characters - and _.

Description - *optional*

Build badge - *optional*

☐ Enable build badge

Enable concurrent build limit - *optional*

Limit the number of allowed concurrent builds for this project.

☐ Restrict number of concurrent builds this project can start

► Additional configuration
tags

Source

Add source

Source 1 - Primary

Source provider

AWS CodeCommit ▼

Repository

Q vprofile-code-repo X

Reference type

Choose the source version reference type that contains your source code.

☒ Branch

☐ Git tag

Environment

Environment image

☒ Managed image
Use an image managed by AWS CodeBuild

☐ Custom image
Specify a Docker image

Operating system

Ubuntu

The programming language runtimes are now included in the standard image of Ubuntu 18.04, which is recommended for new CodeBuild projects created in the console. See [Docker Images Provided by CodeBuild](#) for details [↗](#).

Runtime(s)

Standard

Image

aws/codebuild/standard:4.0

Image version

Always use the latest image for this runtime version

Environment type

Linux

Privileged

☐ Enable this flag if you want to build Docker images or want your builds to get elevated privileges

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

codebuild-satz-service-role

Type your service role name

17. Refer build spec.yml file in directory, that should be added to below buildspec.

Also, S3 needs to be created and mention s3 in below.

Buildspec

Build specifications



Use a buildspec file

Store build commands in a YAML-formatted buildspec file



Insert build commands

Store build commands as build project configuration

Build commands

```
40 ▾ #post_build:
41 ▾ #commands:
42   # - command
43   # - command
44 ▾ #reports:
45 ▾ #report-name-or-arn:
46 ▾ #files:
47   # - location
48   # - location
49   #base-directory: location
50   #discard-paths: yes
51   #file-format: JunitXml | CucumberJson
52 ▾ #artifacts:
53 ▾ #files:
54   # - location
55   # - location
56   #name: $(date +%Y-%m-%d)
57   #discard-paths: yes
58   #base-directory: location
59 ▾ #cache:
60 ▾ #paths:
61   # - paths
```

Switch to single line

Logs

CloudWatch



CloudWatch logs - *optional*

Checking this option will upload build output logs to CloudWatch.

Group name

satziprofile-cicd-project

Stream name

build logs

S3



S3 logs - *optional*

Checking this option will upload build output logs to S3.

Bucket

Q

18. Once all are configured, start the build.. Upto this build generation is done.

Pipeline,

Create a new pipeline

The screenshot shows the 'Choose pipeline settings' dialog in AWS CodePipeline. The dialog is titled 'Choose pipeline settings' with an 'info' icon. It is divided into two main sections: 'Pipeline settings' and 'Advanced settings'.

Pipeline settings

- Pipeline name:** A text input field containing 'satzpipelinew'. Below the field, it says 'Enter the pipeline name. You cannot edit the pipeline name after it is created.' and 'No more than 100 characters'.
- Service role:** Two radio button options:
 - ☒ **New service role**: Create a service role in your account.
 - ☐ **Existing service role**: Choose an existing service role from your account.
- Role name:** A text input field containing 'AWSCodePipelineServiceRole-us-east-1-satzpipelinew'. Below the field, it says 'Type your service role name'.
- ☒ **Allow AWS CodePipeline to create a service role so it can be used with this new pipeline**

Advanced settings

- Artifact store:** Two radio button options:
 - ☒ **Default location**: Create a default S3 bucket in your account.
 - ☐ **Custom location**: Choose an existing S3 location from your account in the same region and account as your pipeline.
- Encryption key:** Two radio button options:
 - ☒ **Default AWS Managed Key**: Use the AWS managed customer master key for CodePipeline in your account to encrypt the data in the artifact store.
 - ☐ **Customer Managed Key**: To encrypt the data in the artifact store under an AWS KMS customer managed key, specify the key ID, key ARN, or alias ARN.

At the bottom right of the dialog, there are two buttons: 'Cancel' and 'Next'.

19. Select the repo, branch name. If any new commits occur this pipeline will get triggered.

Add source stage [Info](#)

Source

Source provider
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.

AWS CodeCommit

Repository name
Choose a repository that you have already created where you have pushed your source code.

Q vprofile-code-repo X

Branch name
Choose a branch of the repository

Q

Change detection options
Choose a detection mode to automatically start your pipeline when a change occurs in the source code.

☒ **Amazon CloudWatch Events (recommended)**
Use Amazon CloudWatch Events to automatically start my pipeline when a change occurs

☐ **AWS CodePipeline**
Use AWS CodePipeline to check periodically for changes

Output artifact format
Choose the output artifact format.

☒ **CodePipeline default**
AWS CodePipeline uses the default zip format for artifacts in the pipeline. Does not include git metadata about the repository.

☐ **Full clone**
AWS CodePipeline passes metadata about the repository that allows subsequent actions to do a full git clone. Only supported for AWS CodeBuild actions.

Cancel

Previous

Next

Add build stage [Info](#)

Build - optional

Build provider
This is the tool of your build project. Provide build artifact details like operating system, build spec file, and output file names.

AWS CodeBuild

Region

US East (N. Virginia)

Project name
Choose a build project that you have already created in the AWS CodeBuild console. Or create a build project in the AWS CodeBuild console and then return to this task.

Q satzproj X

 or

Create project [↗](#)

Environment variables - optional
Choose the key, value, and type for your CodeBuild environment variables. In the value field, you can reference variables generated by CodePipeline. [Learn more](#) [↗](#)

Add environment variable

Build type

☒ **Single build**
Triggers a single build.

☐ **Batch build**
Triggers multiple builds as a single execution.

Cancel

Previous

Skip build stage

Next

Then select the beanstalk environment and create a pipeline.

In between the pipeline, we can add approvals, unit test etc.