REA Group Infrastructure Solution

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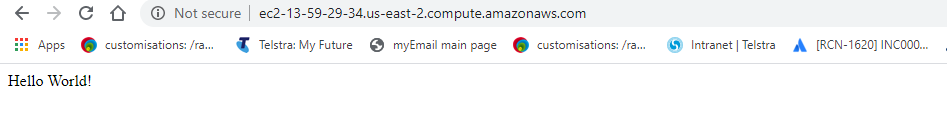
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# Document Scope

This Infrastructure Solution document will identify the design, configuration and implementation process of the Sinatra APP Infra solution within REA Group.

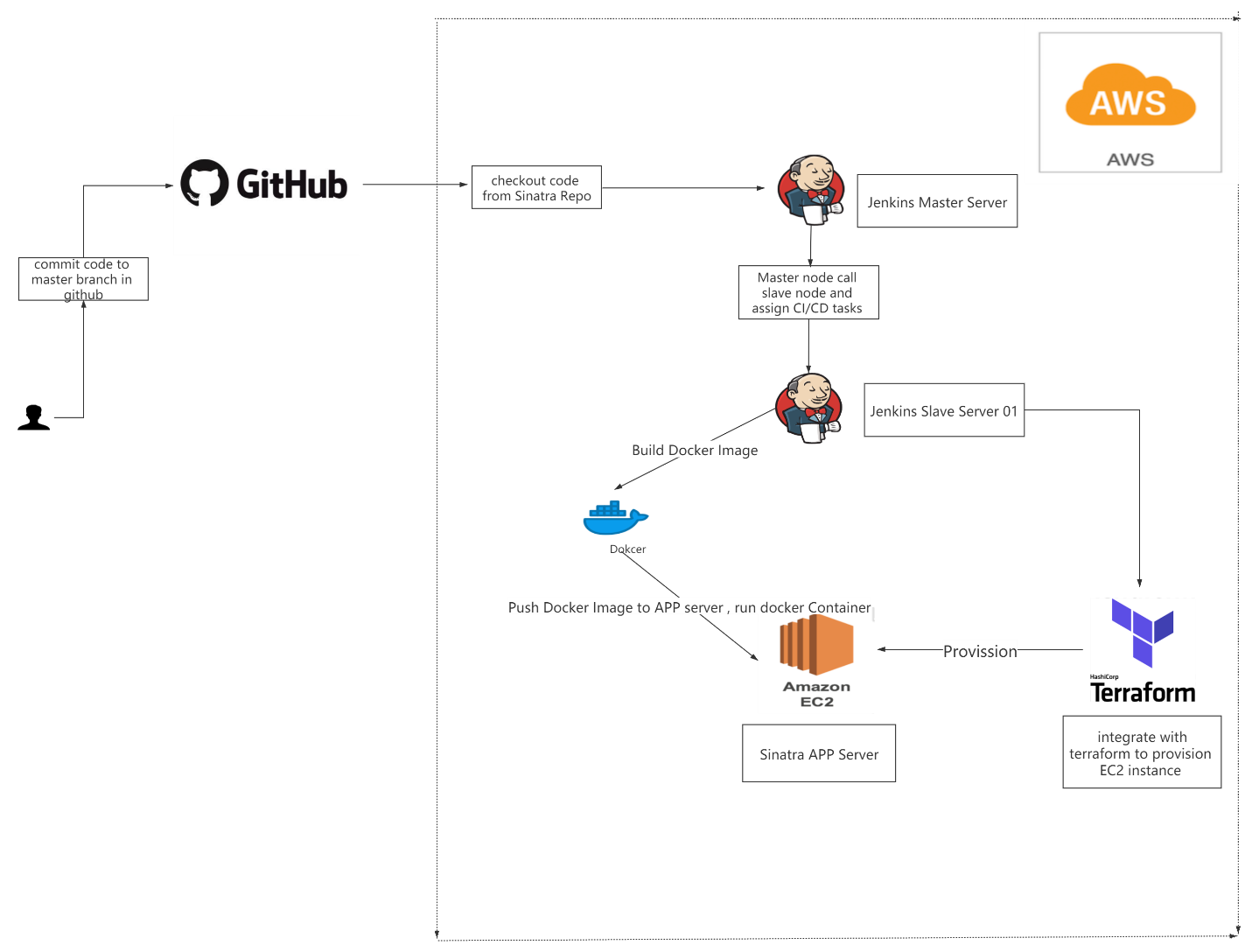
Please Note this document is currently focusing on development environment.

To verify if Sinatra APP working , please follow part 4 instructions or go to AWS console get the APP server public host name ,visit port 80:



# Architecture

The following diagram identifies REA Group CI/CD architecture features within the REA Group Sinatra APP components for dev or test environment.



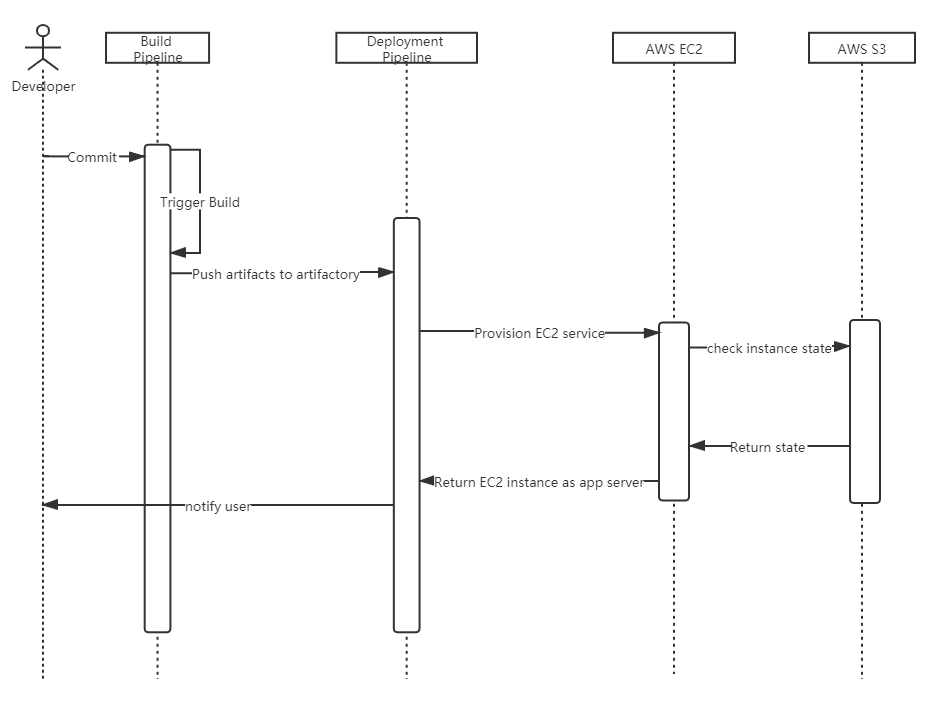
## Resources Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **EC2 Server/S3** | **Host name** | **Application url** | **Private IP** | **Terraform Provisioned** | **In Bound Port number** | **Out Boud port number** |
| **Jenkins Master server** | **ec2-3-15-165-12.us-east-2.compute.amazonaws.com** | **Jenkins Console: ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080** | **Dynamic after reboot, managed by aws** | **no** | **80,8080,**  **22** | **all** |
| **Jenkins Slave 01** | **ec2-13-58-216-114.us-east-2.compute.amazonaws.com** | **No** | **Dynamic after reboot, managed by aws** | **no** | **80,8080,**  **22** | **all** |
| **APP server** | **ec2-13-59-29-34.us-east-2.compute.amazonaws.com** | **Sinatra APP:**  **ec2-13-59-29-34.us-east-2.compute.amazonaws.com:80** | **172.31.3.86** | **yes** | **80,8080,**  **22** | **all** |
| **S3 bucket** | **arn:aws:s3:::terraform-bucket-rea** | **NA** | **NA** | **NA** | **NA** | **NA** |

|  |  |  |  |
| --- | --- | --- | --- |
| **AMI** | **AMI ID** | **Used by Terraform** | **Resources installed under this AMI** |
| **Jenkins Master AMI** | **ami-0b54cefd1dcb62266** | **No** | **Jenkins app and necessary plugins** |
| **Jenkins Slave 01**  **AMI** | **ami-01b1cbf47ccbfda5d** | **No** | **Jenkins slave configs, artifactory folder and docker env for image build** |
| **Sinatra APP server AMI** | **ami-04b8095f7e2c23f12** | **yes** | **Docker and ruby environment** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Repository** | **Repo url** | **Corresponding Jenkins Pipeline** | **Support multi branch** |
| **Sinatra Repo** | <https://github.com/cxcxcx89611/READevopsInfraPlatform> | [**REAInfraPlatform**](http://ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080/job/REAInfraPlatform/) | **yes** |
| **Infra Repo** | <https://github.com/cxcxcx89611/simple-sinatra-app> | [**SinatraAPP**](http://ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080/job/SinatraAPP/) | **yes** |

## CI/CD pipeline



# Pre-requsities && Tech trade-off Consideration

1. Terraform

2. Docker

3. Docker Image ruby2.7

4. Jenkins

5. Github

6. AWS EC2 , VPC, S3, Security group

For this project,

Positive points:

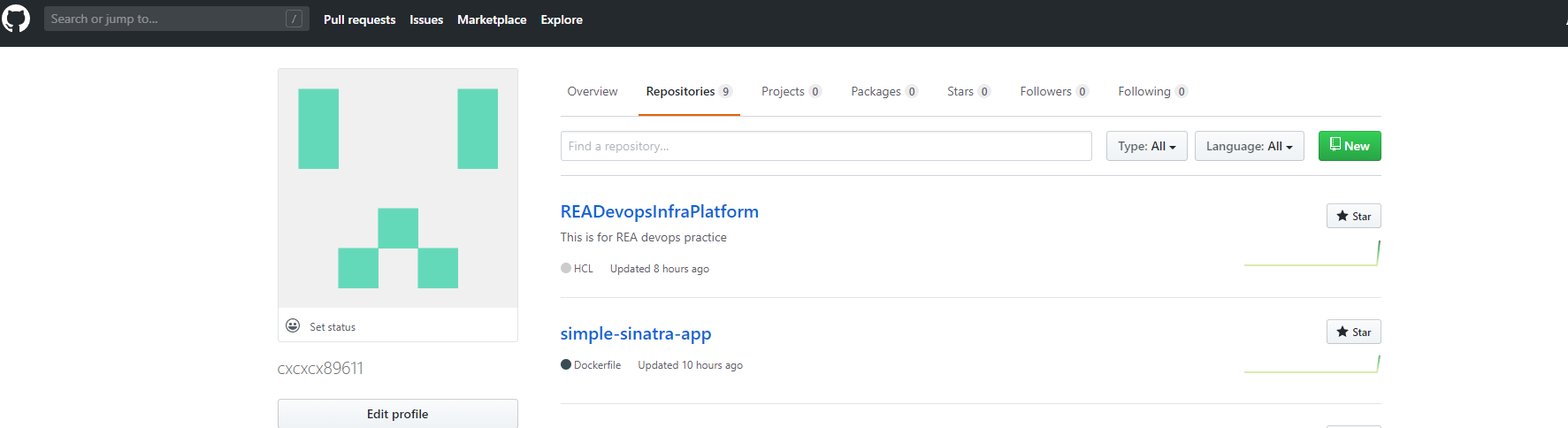
1. To ensure seamless and zero down time of APP server, achieve the concept of Infrastructure as code, Terraform has been used to integrate with Jenkins pipeline to provision EC2 instance during each Infra deployment stage.
2. As need to enable Sinatra APP run on port 80 (initially run on 9292), so a Dockerized Sinatra app on App Sever, can easily mount its port number 9292 to 8080 and also facilitate devops engineer to manage and tag.
3. To facilitate developer and devops engineer’s work, build, deployment pipeline need to be separated. Thus, Sinatra APP and Platform repo, Jenkins project come in use.
4. AWS EC2 instance are protected by Security Group (limited port number can be accessed) and AMI recovery.

Shortcomings:

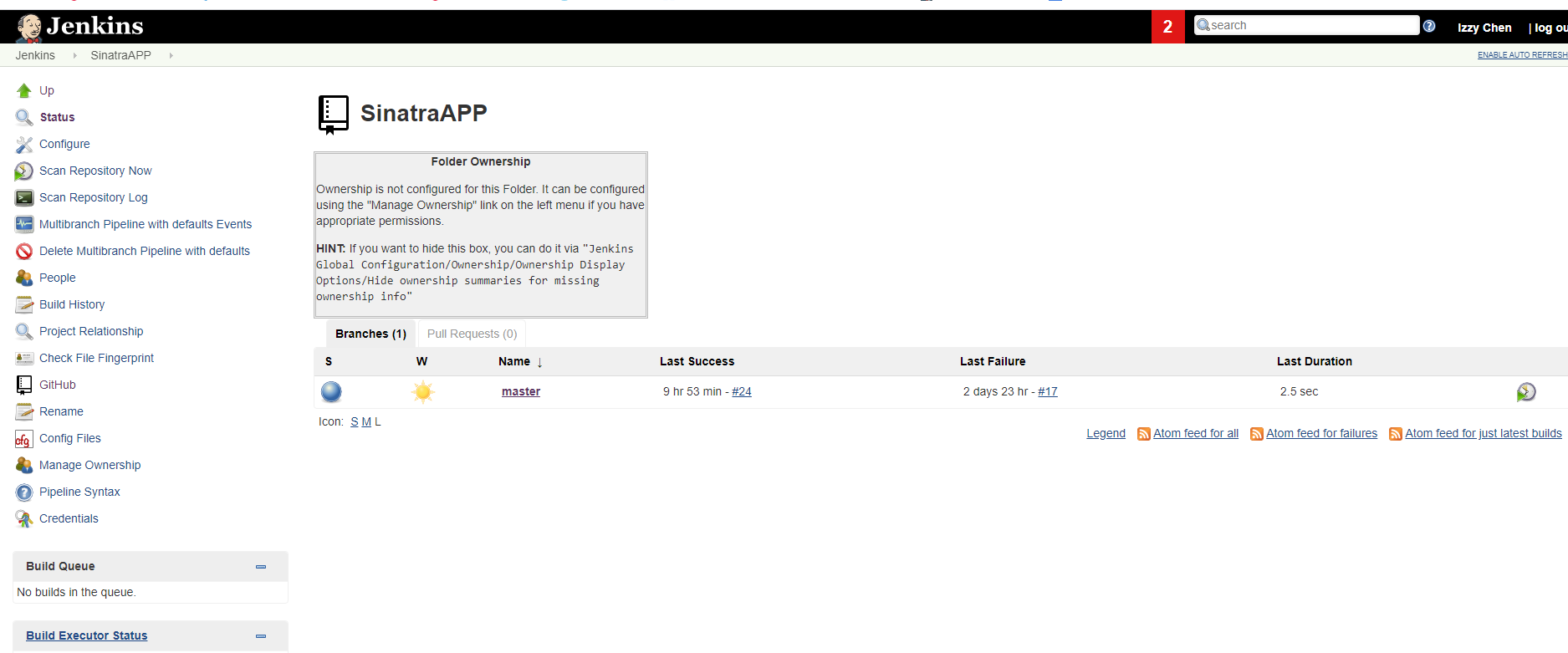
1. As there is only one dockerized application need to be deployed, there is no docker orchestration tool eg: k8s, docker swarm. Will use one of them if there are more dockerized app need to be deployed.
2. As deployment stage is not complex (eg: no High Availability, no need to deploy on multiple servers, only one artefact need to be deployed), so Ansible or Puppet has not be used in this project.
3. EBS volume are not encrypted, ELB, ASG are not used. If it’s production, will use these technologies.

# CI/CD instructions

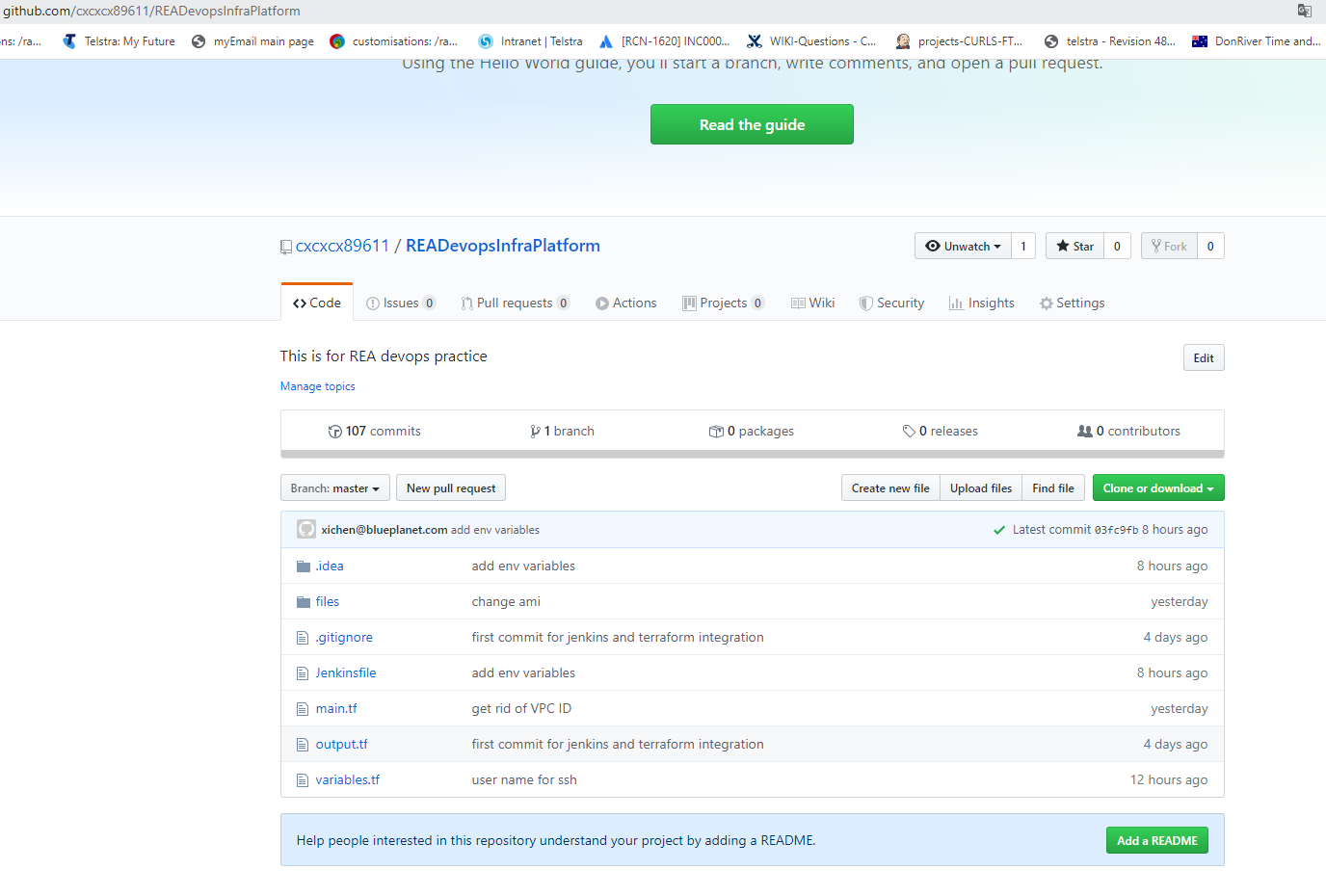
## Github Repository & Jenkins build project



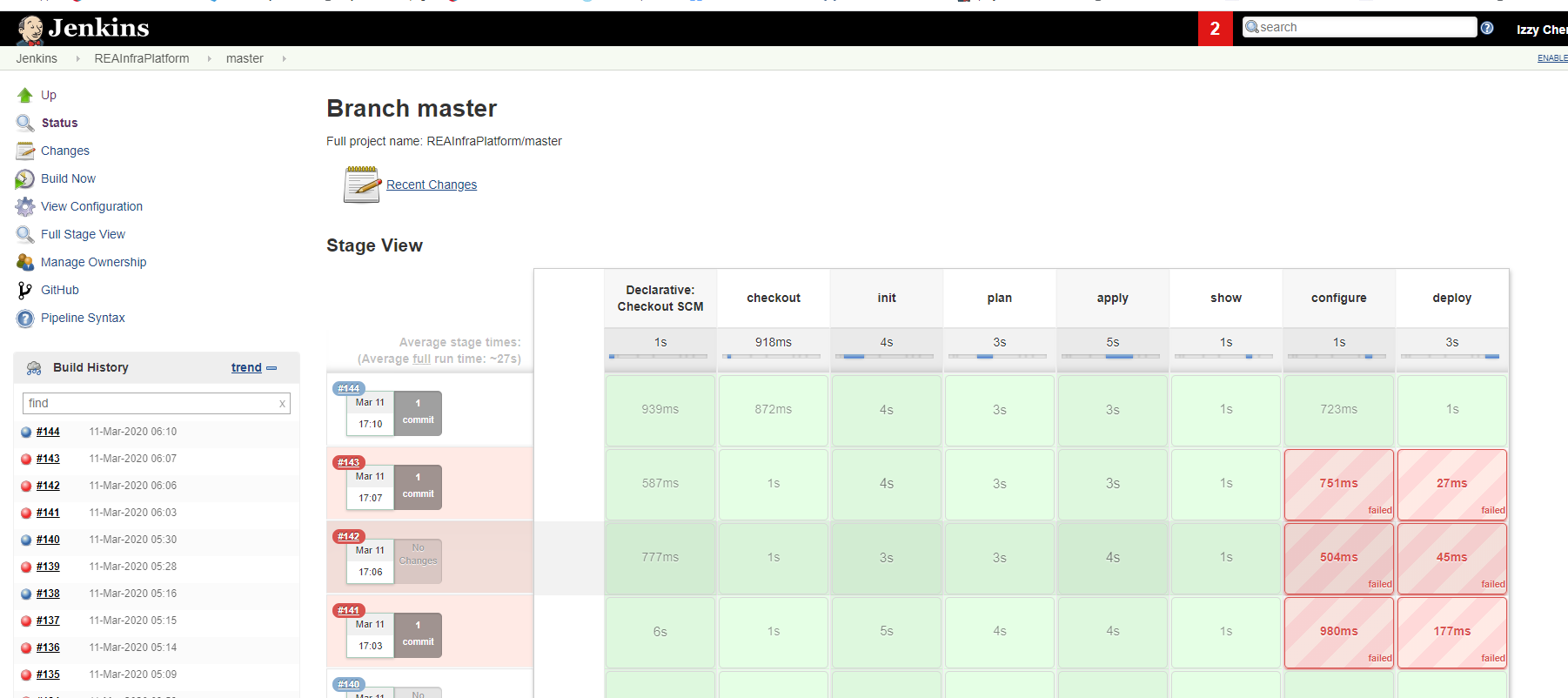
Developer can commit their code into work on Sinatra app repository. Each commit will trigger build pipeline at Jenkins [SinatraAPP](http://ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080/job/SinatraAPP/):



Developer can view build result through Jenkins console and revise their code in Repo accordingly.

Devops engineer will be always managing the Infra code repo : READevopsInfraPlatform and Jenkins build project: [REAInfraPlatform](http://ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080/job/REAInfraPlatform/) 

When release request is raised, devops engineer will manually trigger Infra CI/CD pipeline to initialize, provision EC2 instance, deploy Sinatra APP into App server:



Please note: Jenkins console is : <http://ec2-3-15-165-12.us-east-2.compute.amazonaws.com:8080/>

Username/password is : izzy/8RisjA$59

Git hub repo: <https://github.com/cxcxcx89611>

account name/ password is : cxcxcx89611/8RisjA$59

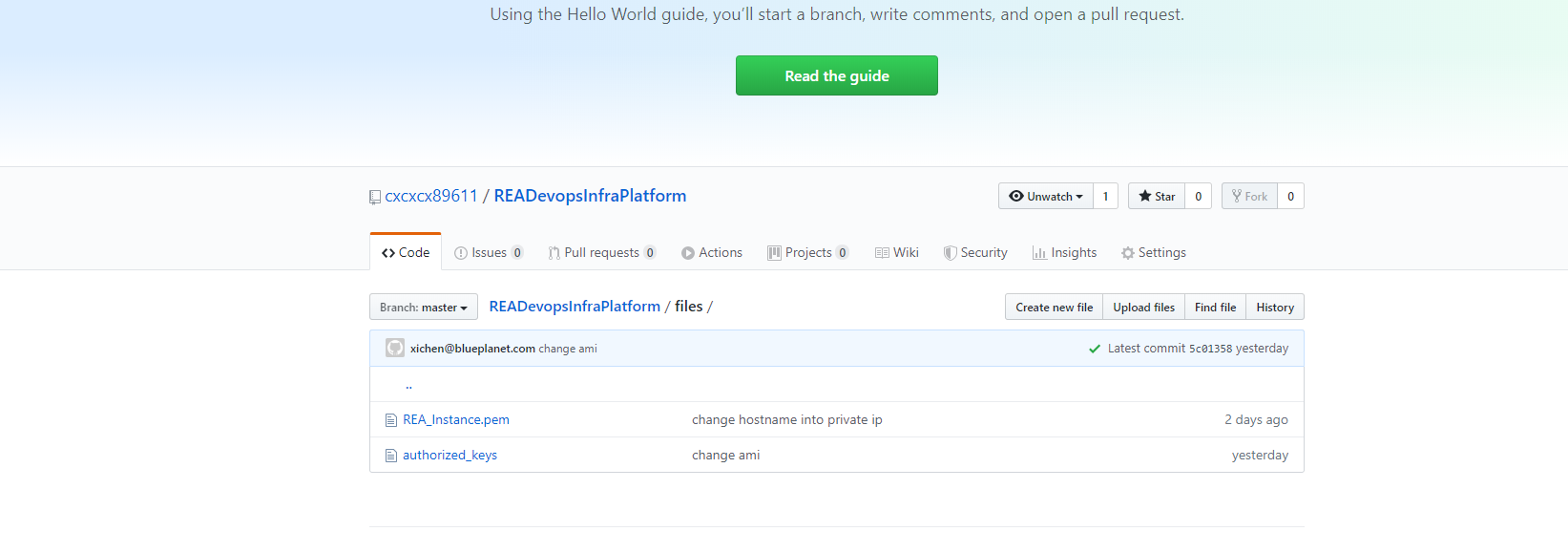
As this project is now using AWS free tier Instance which is not stable. If you get 400 error when hit the above console url, please use command connect to Jenkins Master server:

**ssh -i "REA\_Instance.pem" root@ec2-13-59-29-34.us-east-2.compute.amazonaws.com**

Then use command : **sudo systemctl restart Jenkins**

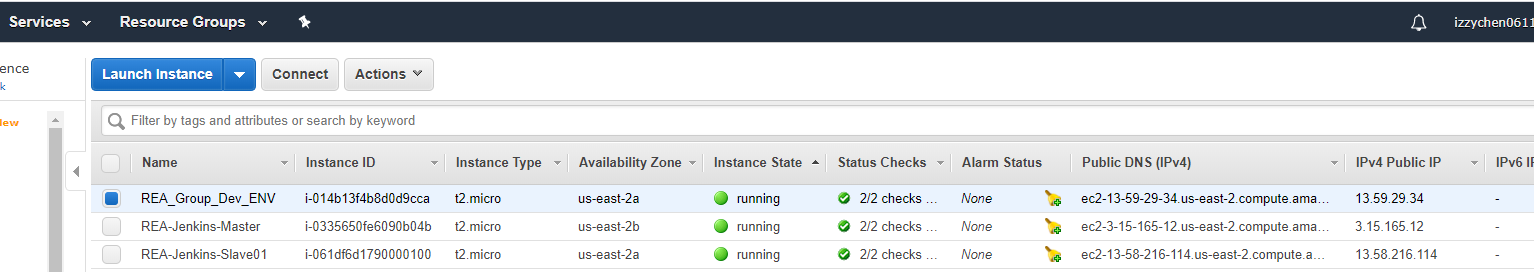
Reboot Jenkins application.

PEM file is under READevopsInfraPlatform code repo files folder (This is highly not recommended , only for reviewer’s convenience to get this PEM file, will never upload it into repo in actual situation):



## AWS EC2 instance

Three EC2 instance are running for this Sinatra project:



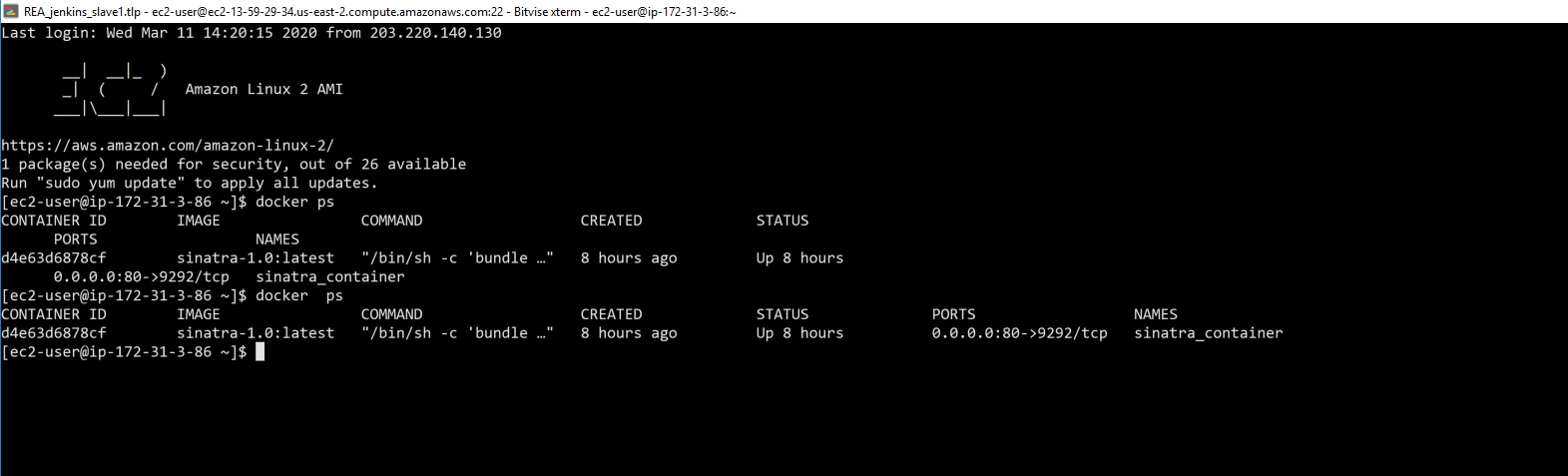
To login AWS console ,

User name: [Izzychen0611@gmai.com](mailto:Izzychen0611@gmai.com)

Password: CXCXXcx89611!

Devops engineer can monitor these 3 instances status through console and manage Jenkins related instances manually.

Eventually, Sinatra APP will be deployed as a docker container on REA\_Group\_Dev Ec2 instance:



Devops engineer can ssh to app server to view container status

# Document history

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| --- | --- | --- | --- |
| Date | Version | Author | Description |
| 12/03/2020 | 1 | Izzy Chen | Izzychen0611@gmail.com |