

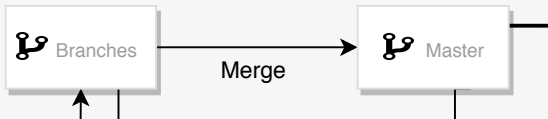
Continuous integration

GitHub

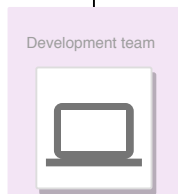
- Docker File: container environment for API
- Docker File: container environment for SQL Database
- YAML File: SQL Database Docker container
- YAML File: API Docker container
- YAML File: CloudFormation template
- YAML File: ECS Task Definitions
- Application src code
- Database schema + environment scripts

Optionally

- Jenkins setup + plugins script
- Jenkins pipeline setup script



Push code

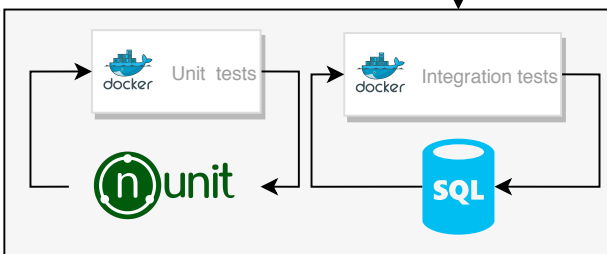


Jenkins

- Compile src code
- Pull Docker file from Github
- Pull YAML files from Github
- Run YAML files
- Build Docker images
- Run Docker images
- Run Unit Tests
- Run Integration Tests
- Tear down test environment
- Build artifacts

Feedback

Run Tests

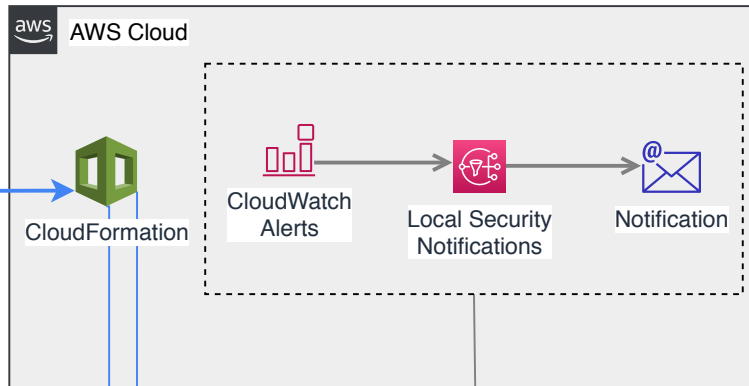


Continuous deployment

Jenkins

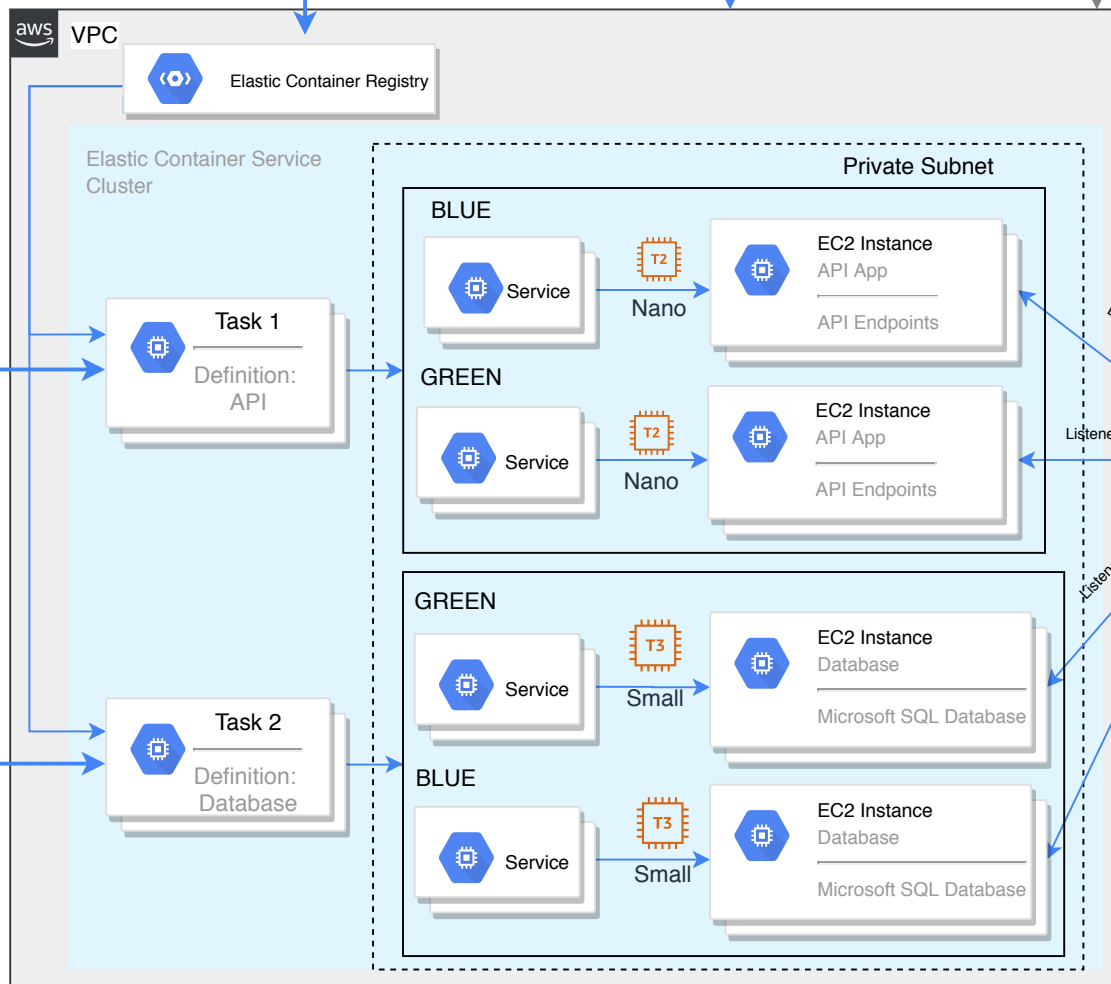
- Push Docker images to AWS ECR
- Run CloudFormation template
- Run ECS Task Definition deployments
- Update Load Balancer rules

Run Template



Deploy updated definitions

Push updated images



Blue-Green swap

Considerations:

- This tool chain can be simplified by using other tools that have a complete CI/CD + git version control setup, eg. GitLab. For the purpose of this demonstration focus will be around using GitHub and Jenkins.
- Using Blue-Green deployment model for releasing changes to both instances on ECS. This will cater for schema changes in the database or breaking changes in the app.
- Main Jenkins plugins used in this design: Blue Ocean, GitHub, GitHub Integration, Docker, Amazon EC2 Container Service, Pipeline: AWS Steps
- Cost estimation:

<div>Amazon EC2<div>Region: Asia Pacific (Sydney)</div><div><div>Edit</div><div>Action ▾</div></div></div> <div><div>Quick estimate</div><div>Operating system (Windows Server), Quantity (2), Storage for each EC2 instance (General Purpose SSD (gp2)), Storage amount (1 GB), Instance type (t2.nano)</div><div>Monthly:10.75 USD</div></div>		
<div>Amazon EC2<div>Region: Asia Pacific (Sydney)</div><div><div>Edit</div><div>Action ▾</div></div></div> <div><div>Quick estimate</div><div>Operating system (Windows Server), Quantity (2), Storage for each EC2 instance (General Purpose SSD (gp2)), Storage amount (30 GB), Instance type (t3.small)</div><div>Monthly:60.20 USD</div></div>		
First 12 months total	Total upfront	Total monthly
851.40 USD	0.00 USD	70.95 USD

Optionally

<div>Services (4)</div> <div>Amazon CloudWatch<div>Region: Asia Pacific (Sydney)</div><div><div>Edit</div><div>Action ▾</div></div></div> <div><div>Monthly:1.71 USD</div></div>		
<div>Elastic Load Balancing<div>Region: Asia Pacific (Sydney)</div><div><div>Edit</div><div>Action ▾</div></div></div> <div><div>Application Load Balancer</div><div>Number of Application Load Balancers (1)</div><div>Monthly:2,938.40 USD</div></div>		
First 12 months total	Total upfront	Total monthly
36,132.66 USD	0.00 USD	3,011.06 USD