TM DevOps – Use Case

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Document Details

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Scope

This document provides a detailed use case study on development and operations (DevOps) using Continuous integration and continuous delivery (CI/CD) including AWS services and third-party application, with guidelines for implementation.

About Customer

Marketfront is a platform for sellers. Today a seller has many options to sell their products online on different marketplaces. Prominent ones Amazon, Flipkart, PayTM, Shopclues, and Ebay provide API's to do tasks like updating inventory, modify prices and fetch orders. A seller will find it difficult to do all these tasks manually. Marketfront helps sellers do all these tasks without their intervention by automating most of the manual processes. This helps the sellers to focus on their core tasks which help increase sales. Some of the other tasks that Marketfront automatically performs are price suggestions, purchase order automation, catalog recommendations

Customer Requirement

Micro Services / SOA type of Application architecture need to be aligned with AWS Architecture for four application interface layers with DevOps compliance for application development and deployment framework

- Frontend Web App
- Services Layer
- Backend API App
- Database

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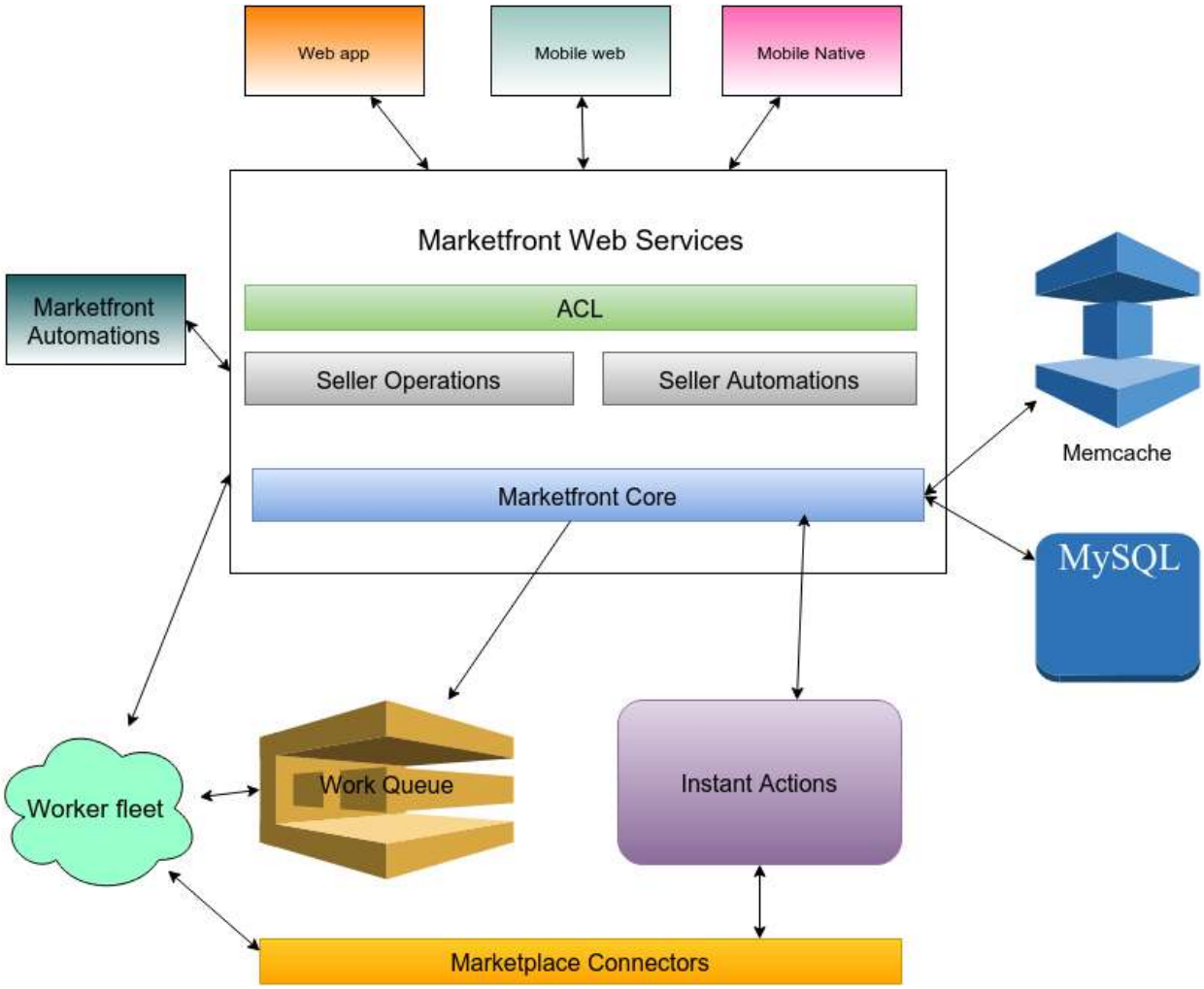
Existing Application Architecture



Pre-Conditions/Trigger

- Rapidly changing competitive landscapes, evolving security requirements, and performance scalability
- Requirement for frequent updates, regular patching and frequent configuration changes
- Saisanj Pvt Ltd – application architecture not full or minimal DevOps compliance with Development, Deployment and with configuration changes and management process

Architecture

DevOps - CI/CD Architecture for Saisanj Pvt Ltd.
Language – Java Script, NodeJS, PHP,
Build – AWS Jenkins, AWS CloudFormation, Shell Scripts
Deployment – All Stack with Application and DB on AWS Infra

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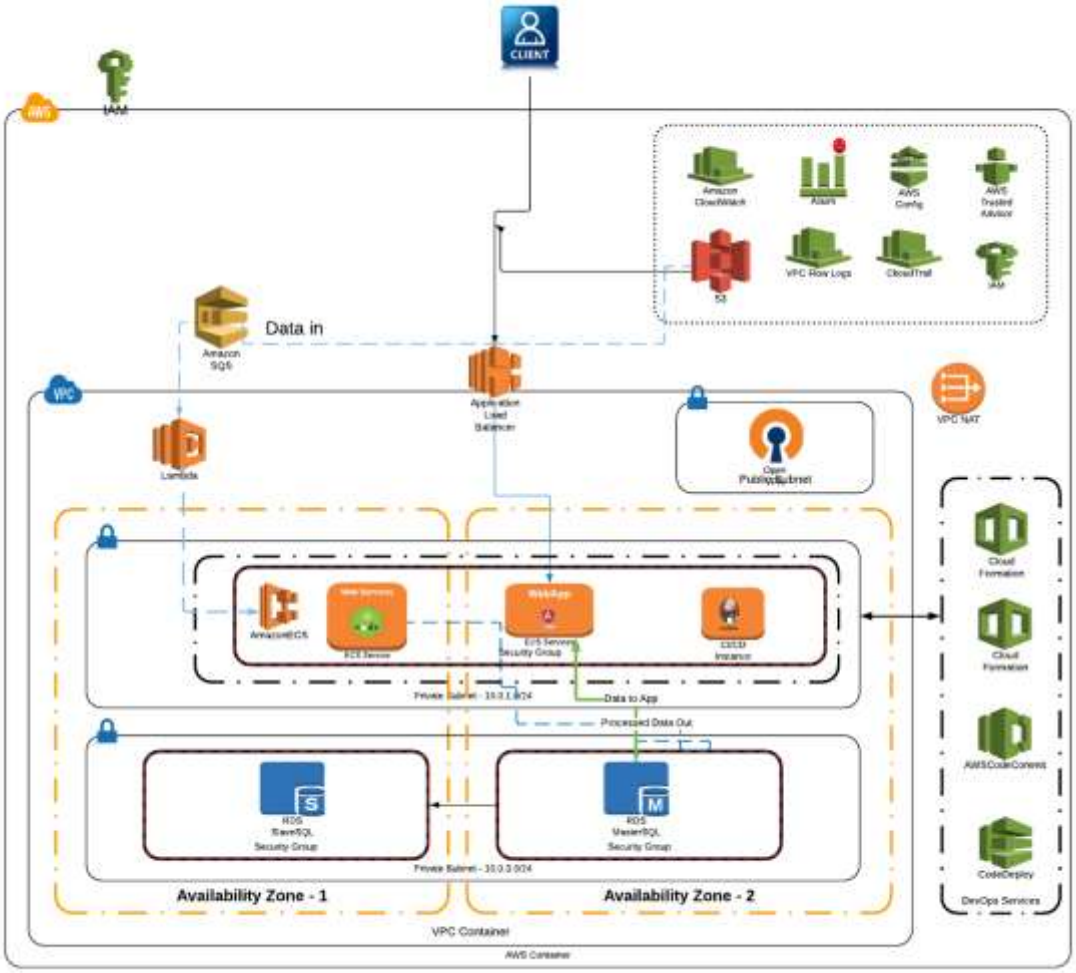

About Templated CloudFormation with DevOps

AWS CloudFormation provides a common language to describe and provision all the infrastructure resources in your cloud environment. CloudFormation allows you to use a simple text file to model and provision, in an automated and secure manner, all the resources needed for applications across all regions and accounts. This file serves as a single source of truth for cloud environment. AWS CloudFormation is available at no additional charge, and you pay only for the AWS resources needed to run your applications.

Continuous Integrations

Saisanj Pvt Ltd –services handles various configuration changes on Marketfront service oriented architecture, however there were no templates and pre-defined process and scripts in place to automate the Infrastructure configuration change managements. Hence we implemented DevOps using AWS CloudFormation and Shell scripts to automate the configuration management.

We used AWS CloudFormation to automate the configuration changes which helped to achieve the IT automation for few projects with similar stacks.

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Continuous Integration of Cloud Formation Templates

AWS CloudFormation was used to create, deploy and update the stack. The customized CloudFormation templates used JSON format to create various stack. Below is the list of few use cases we have deployed for various customers.

- LAMP on EC2 + RDS + S3 for Media Customer
- Dot Net, MS-SQL on Ec2 + RDS + S3 for Pharma customer
- JBOSS on EC2 + RDS + S3 + ALB + CloudFormation for Product based development company

These custommized CloudFormation templates are stored and Version controlled with AWS CodeCommit . Above said use cases were automated with customized CloudFormation templates based on specific stack verion and resource sizing requirements.

Version Control

Version control is enabled for all customized stack templates with specific requirements and configuration changes tracked with version history using AWS code commit

Continuous Delivery with CloudFormation

CF templates modifications on configuration are done from one environment to another environment with Jenkins and AWS Code Committo to create , clone, deploy and update stacks

Continuous Deployment with CloudFormation

CF templates are used for various stack deployments on AWS along with Jenkins and customized CF templates. CF templates helped to migrate and clone infrastructure stack one region to another region quickly. Continuous deployment made easy to automate migrations and implementations for our internal teams.

Benefits with DevOps using Cloud Formation

Templated Stacks

We used templated stacks to deploy the below listed most wider used AWS CloudFormation templates for our client implementations with changes required based on their application version changes

- Jenkins – Single-AZ
- RDS Master and Slave – Multi-AZ
- S3 Website-CloudFront distribution
- ECS-Multi-AZ
- Route-53-RoundRobin
- LAMBDA-SNS-SQS-S3-API Gateway
- Autoscaling-Multi-AZ-with-notiifcations

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Version Controls
We used AWS code commit to store above said stack and configuration templates and customizations were deployed using Jenkins

Faster deployments
With AWS Cloudformation templates, deployments are quicker and fatser when compared to manual deployments

Hybrid Deployments
With Cloud Formation templates, formats such as JSON, we can deploy the Kuberneters Cluster deployments on AWS EKS.

Clone Deployments
We used AWS CloudFormer tool on AWS Cloud formation to create template using existing resources, so that clonig to another account or regions is quicker.

Portable Deployments
Cloning the complete infrastrucure in different regions with little changes on s3 buckets name and route53 domains are much easoer now.

Security with DevOps using CloudFormation

Security Framework using AWS Services

- **Cloud Trail** used for security audit for AWS resources deployed for this customer application hosting on AWS Cloud with DevOps platform
- **Trusted advisor** used for security check and monitor for any resources status changes and optimizing infrastructure
- **IAM** used as most important part of this implementation for security authentication with AWS EC2, S3 buckets, AWS Code Commit using user and roll based policies.
- **VPC Flow logs** configured to log the complete traffic flow and security analysis, audit and future tracking purposes

Protected Access Control
We used AWS IAM credentials for deployments of AWS commit with Cloud Formation templates for various stacks.

User and Roll based Authentication
With IAM user based and role based authentication we enabled specific action policies on specifc resources and services like,

- Stach Creation
- Stach Cloning
- Updating Stack
- Stach Deletion

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Security Groups

We used Cloud Formation to re-configure specific security groups to alow or restricit IP/port for stack based application requirements

Custom VPC with CloudFormation

We created and deployed Cloud Formation templates with custom VPC, private subnets, public subnets for only opnvpn instance, NAT gateway for secured deployments on AWS. We used same deployments as our standard and default depoyment process for secured deployments. With this default template we used OpenVPN instance to establish connections between customer workstations to AWS VPC.