AWS DevOps – Case studies

TechMinfy DevOps

Sample Use Case

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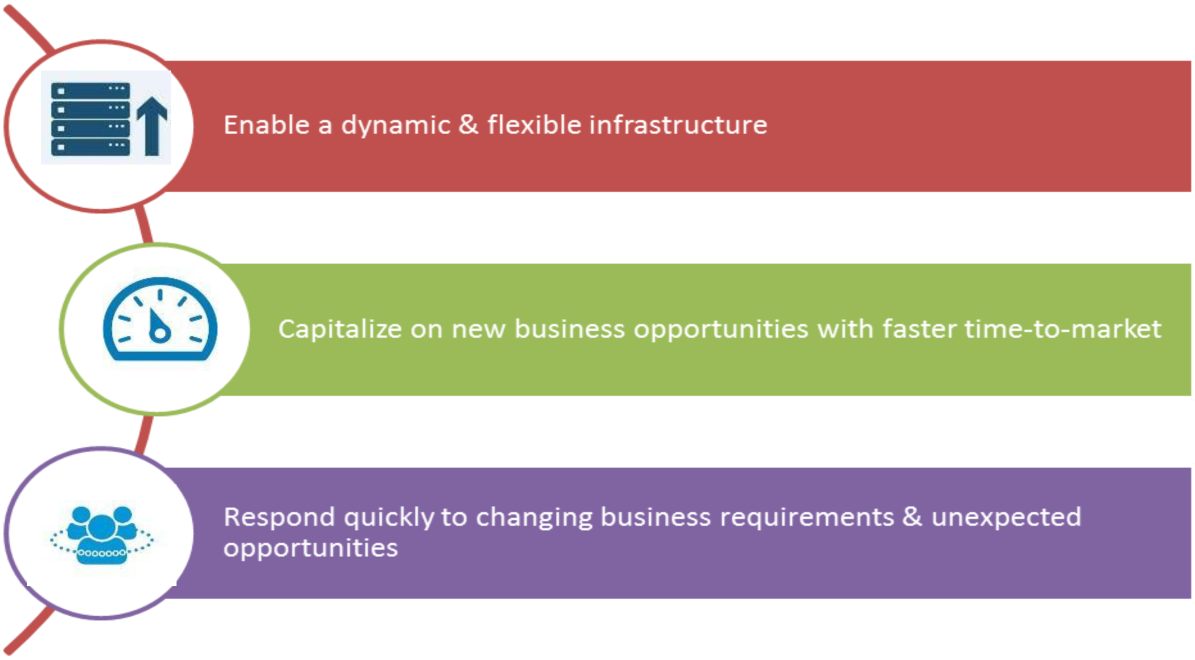
About TechMinfy

An Amazon Web Services (AWS) certified partner, TechMinfy is a global service provider of business and technology consulting services. We specialize in providing Cloud Assessment, Migration, Cloud Consulting and 24*7 Managed Services.

- **$12M** TechMinfy is part of Mahaveer Group with annual revenue of 12 million USD
- **150+** Consultants and growing
- **100+** Start-up to Fortune 1000 Customers currently being served
- AWS Regional Rising Star, 2016

We can help you get ahead!!

In pursuit of staying competitive to meet rapidly changing business goals and objectives, CIOs across businesses are looking for a solution that would catapult their capacity to scale infrastructure on demand with a reduced Total Cost of Ownership (TCO).



Enable a dynamic & flexible infrastructure

Capitalize on new business opportunities with faster time-to-market

Respond quickly to changing business requirements & unexpected opportunities

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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

Knowledge Crystals Private Limited is a Private incorporated on 21 October 2014 and product based development firm in initial stage its product development on standard web application and mobile applications.

Use Case Description

Knowledge Crystals is software Development Company and developing their product with stack of Java and Angular JS and deployment on AWS Infrastructure.

This company was not DevOps compliance. Following activities are completely manual process.

1. code push
2. code merge
3. build & test
4. deployment

Development team used to spend more time on the above said activities instead on productivity. Knowledge Crystals approached us to provide CI/CD integration for these activities.

Primary & Supporting Actors

Actors from TechMinfy:

Prabhakar Dharmalingam (Primary)

Raghu Penchala (Supporting)

Actors from Knowledge Crystals:

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Divyanand (Primary)

Prasanth Kumar (Supporting)

Pre & Post Conditions

Pre-implementation state at Knowledge Crystals:

- Code merge process is manual
- Wrong code merge or pull occurred many times i.e developer need to merge code from KCWeb/master branch to its sub branch “subranch1”, but instead that KCWeb/master branch code merged to KCBBackend/master. This caused complete mess up on two repositories
- Eclipse Java compile is manual process errors are not tracked
- Java WAR file deployment is manual process and wrong deployments also occurred to wrong environments on AWS Elastic beanstalk.
- DEV team used to spends more and more time on to fix above said issues instead on product development

Post-implementation state at Knowledge Crystals:

- Code merge process attached Jenkins jobs and wrong code merges are prevented and it is automated process with one click of DEV team leader
- Code merge job is restricted only DEV team leader, so unauthorized or multiple code merge process is controlled by only DEV team leader and wrong repo or branch code merge is prevented.
- Code pull and checkout process is automated using Jenkins, so code pull from wrong branch is prevented
- Eclipse compile process was replaced with Jenkins maven build step and each every compile errors are logged and
- The errors logged notified to the respective developer team leader and team by E-Mail notification in case build failures
- Deployment using Jenkins job with AWS Elastic Beanstalk plugin(Cloudbees) prevented wrong environment deployment on AWS Elastic Beanstalk

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- For build rollback purpose each and every successful builds are archived and using Jenkins parameterized build and rollback is performed in-case of build failures
- DEV Team time is utilized effectively on product development instead on build and activities

Trigger

- Multiple events of wrong code merge and code pull for process is main root cause to trigger or to make the team leader to decide to implement CI/CD (DevOps) process in his software development life cycle policy.
- Since build and compile errors was not tracked developers used to spend more time re-run the compiler to track the build errors and this also another reason to make think of DevOps by DEV team leader
- DEV team leader decided to implement CI/CD Process for Code Pull, Compile, Build, Test and Deployment using AWS Services with support of TechMinfy.

Scenario

Steps to automate build process

1. Setup Jenkins with JDK 8 on AWS EC2 instance
2. Installed all Jenkins base plugins as pre-requisites
3. Installed AWS credentials plugin to authenticate with AWSCodeCommit
4. Installed Angular CLI for build
5. Installed Node & NPM for build dependencies packages for Angular 2 builds
6. Installed AWS S3cmd to upload html static files on S3bucket of Static web hosting enabled
7. Create freestyle type job to automate the build process of
   - ➢ Code pull
   - ➢ Code checkout to the correct branch
   - ➢ Install dependent packages for build using npm
   - ➢ Build html files
   - ➢ Deploy on AWS S3 bucket using aws s3cmd
   - ➢ Archive successful builds as artefacts for build release history and rollback plan
8. E-Mail notifications on build status with logs

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Introduction to DevOps

Dev and Ops are no longer exclusively separate roles within the IT space. Today, they're morphing into one cohesive method and opportunity which is reshaping the way that IT teams operate. Most would define DevOps as a movement, practice, or culture that aims to tie IT professionals and software developers together so that they can more efficiently streamline infrastructure changes and software delivery. Essentially, it's rooted in the idea that **building, testing and releasing software can run more smoothly and automatically if the appropriate team of professionals are working together.**

Application Architect on AWS

Knowledge Crystal application stack

1. Frontend Angular 2 – static content for UI framework deployed on AWS S3 bucket using static website hosting
2. Backend application – JAVA using AWS Beanstalk

Database – MySQL using AWS RDS

Implementation of CI/CD

TechMinfy supported Knowledge crystals to bring in to DevOps (Continues Integration) Platform on AWS using AWS Commit, Jenkins and AWS Code Deploy.

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DevOps – CI/CD Architecture for Knowledge Crystals for Angular 2

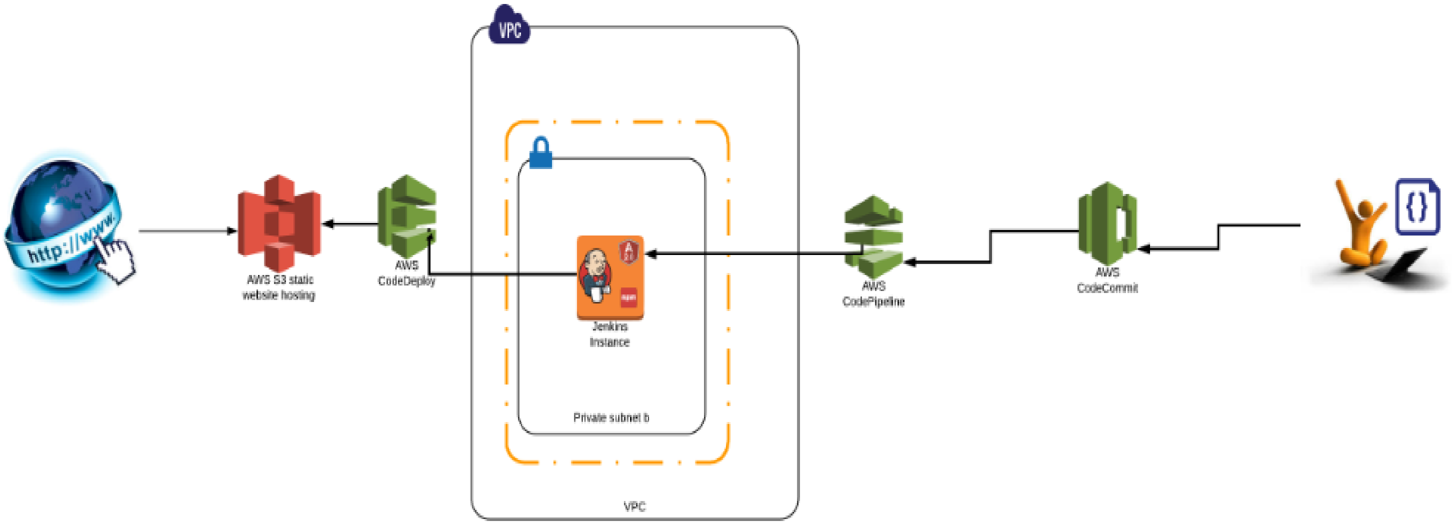
Code Repository: AWS CodeCommit

Build: Jenkins 2.7.9 using git and maven build plugin

Deployment: AWS S3 bucket static website hosting

CI Integration process steps

- Freestyle job using AWS CodeCommit Repository to trigger build when developers pushed any code changes to the repo and its branches using SCM poll
- Build use maven build plugin to generate html files
- Transfer html files to S3 bucket using s3cmd
- Email notifications to the team who made build success and failed



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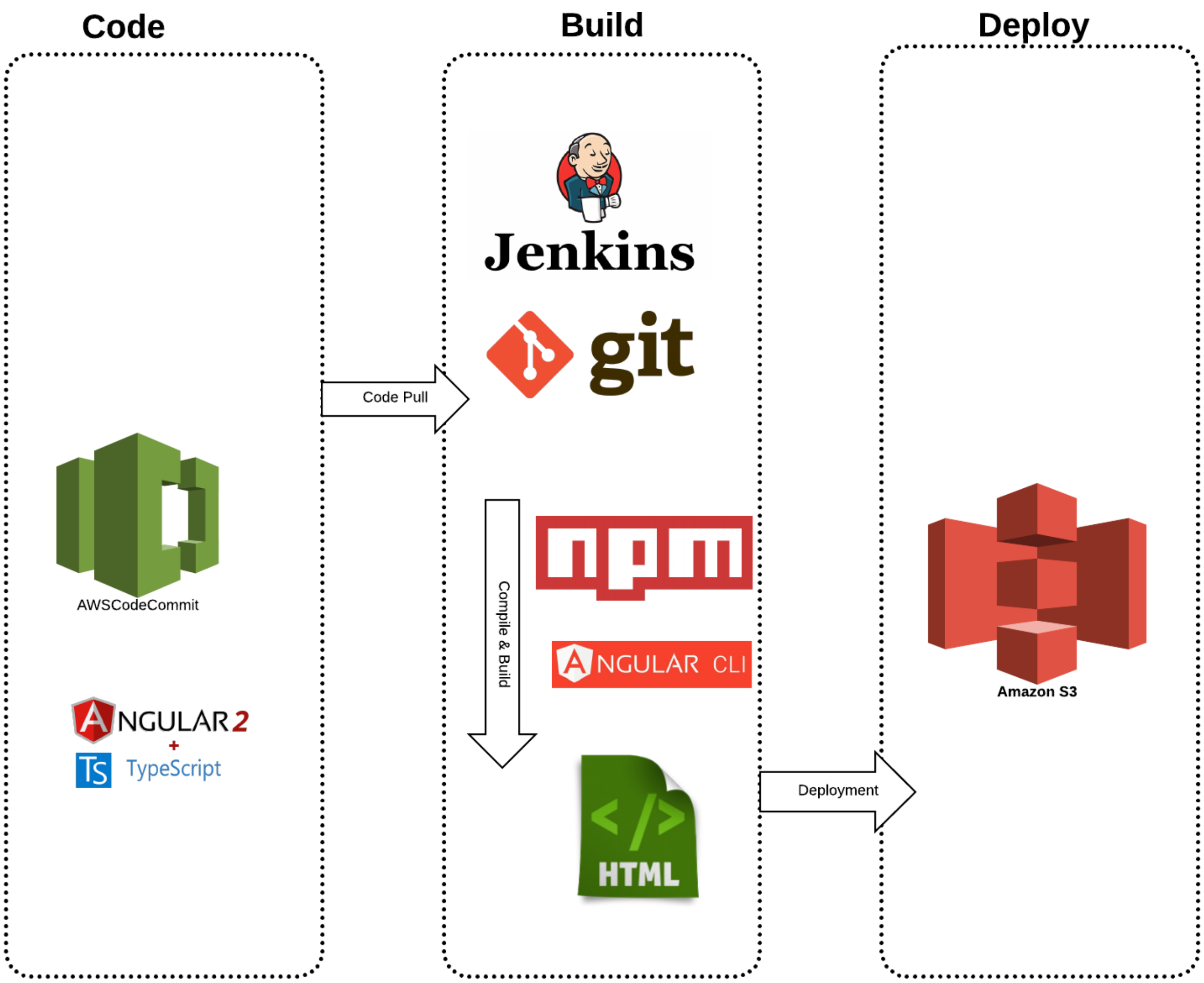
CI/CD Flow diagram



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Benefits of DevOps – post implementation CI/CD

The most important point to remember from this case study is that the enormous cost savings and improvements in productivity were only possible on the basis of a large and ongoing *investment* made by the team in test automation and continuous integration. Even today, many people think that Lean is a management-led activity and that it's about simply *cutting costs*. In reality, it requires *investing* to remove waste and reduce failure demand—it is a worker-led activity that, ultimately, can continuously drive down costs and improve quality and productivity.

1.1 Faster build time

1.2 Faster delivery

1.3 Developer time effectively on product development instead time spend on manual build issues.

1.4 Track of builds history

1.5 Track of build errors

1.6 Continuous build process without any human interventions

1.7 Developers notified build status

1.8 Rollback for build failures

1.9 Better release management for build artefact's

2. Benefits of DevOps – post implementation CI/CD

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