**An**

**Industrial Training Report  on**

# "Automation with Ansible - DevOps" (RH294)

*Submitted in partial fulfillment for the award of the degree*
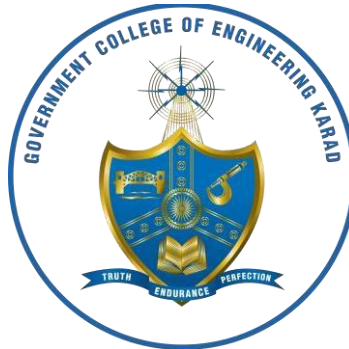
*of*

BACHELOR OF TECHNOLOGY

*In*

INFORMATION TECHNOLOGY

**Submitted by**

Dhiraj Ravindra Bodake (18141216)

**Under the Guidance of**

1. Prof. A.B. Chaudhari
2. Prof. C.P. Garware



**Government College of Engineering, Karad**

**(An Autonomous Institute of Government of Maharashtra)**

**Academic Year 2021-2022**

# Government College Of Engineering, Karad

**(An Autonomous Institute of Government of Maharashtra)**

## Department of Information Technology

# *CERTIFICATE*

This is to certify that the Seminar entitled *"***Automation with Ansible - DevOps***" is submitted by* **Dhiraj Ravindra Bodaake(18141216)** *under my supervision and guidance, partial fulfillment for the award of the BACHELOR OF TECHNOLOGY in Department of Information Technology from Government College of Engineering, Karad for the academic  Year 2021-22 Sem. VII.*

**Prof. A. B. Chaudhari**
**Prof.  C. P. Garware**
**Academic Supervisor**

**Dr. S. J.  Wagh**
**Head,**
**Information Technology Department**

# Industrial Training Certificate

**CERTIFICATE**
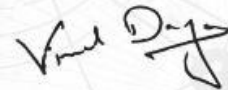**OF TRAINING**

**LINUX**WORLD

This certificate is hereby bestowed upon

*Dhiraj Bodake*

for the exceptional performance that has led to the successful
completion of **Automation with Ansible - DevOps**

A 32 hour training that covers Provisioning and Configuration
Management of instances in Public cloud - AWS and on premises
Infrastructure As Code using Ansible dynamic inventory with optimised
playbook under the Mentorship of Mr. Vimal Daga

Certificate No - **LWIPL-JPR-2020-5513**
Duration - **24th July - 04th Sep, 2021**

**Authorised Signatory**
LinuxWorld Informatics Pvt. Ltd.

# Declaration

I am **Dhiraj Ravindra Bodake(18141216)** of class Final Year B.Tech. in Information Technology sincerely declare to the best of my knowledge that I am the sole writer of this report and no one has ever submitted this work in Government College of Engineering, Karad and Shivaji University or any other learning institution.

Sign: Dhiraj Ravindra Bodake

Date:  24-10-2021

# Approval

This report has been completed and submitted by Dhiraj Ravindra Bodake under the guidance of field supervisor at karad with the approval of the following supervisors;

**Field Supervisor:**

Signature: Vimal  Daga

Date and Stamp: Vimal Daga

**Academic Supervisor:**

Signature: A. B. Chaudhari, C.P. Garware

Date and Stamp: A. B. Chaudhari, C.P. Garware

# Acknowledgement

I would like to express my gratitude to Government College of Engineering, Karad for giving me this opportunity to do an Industrial Training as a partial fulfilment of the requirement for the degree of Bachelor of Science in Information Technology. Throughout this training, I am very honoured with the encouragement and guidance from my supervisors Mr. Vimal Daga and my academic supervisor Prof. A. B. Chaudhari and Prof. C.P. Garware. I thank the staff of Government College of Engineering, Karad for being supportive and sparing the time to share their knowledge in various fields. In addition, I offer sincere thanks to my fellow trainees for making learning an interesting team work adventure.

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# Abstract

Before DevOps ,the model used for software development was the WATERFALL Model. This model is best suited when all the requirements are present beforehand. Here beforehand signifies the planning stage. All the requirements should be finalized at that time only. No later changes can be entertained. No work is in parallel for our software development in this model. Previously, After the product planning phase, we move to the product development phase and then the testing phase and then the product building phase.

No effort is done in parallel. So, the software release life cycle is also very very long. After automation Concepts we had been using different scripting languages to automate manual processes. But these all language are imperative in nature hence we can't rely on these language because these languages reduce the performance of target system. But now days we have configuration tools like puppet,ansible etc. These tools are declarative in nature. The ansible is most used tool in all other configuration tool because it more powerful and has many more features

# List of Abbreviations

| Acronym | Definition |
| --- | --- |
| DevOps | Development and Operations |
| K8s | Kubernetes |
| GCP | Google Cloud Platform |
| IT | Information technology |
| AWS | Amazon Web Services |
| SDLC | Software Development Lifecycle |

# Introduction

Before DevOps ,the model used for software development was the WATERFALL Model. This model is best suited when all the requirements are present beforehand. Here beforehand signifies the planning stage. All the requirements should be finalized at that time only. No later changes can be entertained. No work is in parallel for our software development in this model. Previously, After the product planning phase, we move to the product development phase and then the testing phase and then the product building phase. No effort is done in parallel. So, the software release life cycle is also very very long.

After automation Concepts we had been using different scripting languages to automate manual processes. But these all language are imperative in nature hence we can't rely on these language because these languages reduce the performance of target system. But now days we have configuration tools like puppet,ansible etc. These tools are declarative in nature. The ansible is most used tool in all other configuration tool because it more powerful and has many more features.

# Significance and Rationale

After automation Concepts we had been using different scripting languages to automate manual processes. But these all language are imperative in nature hence we can't rely on these language because these languages reduce the performance of target system. But now days we have configuration tools like puppet,ansible etc. These tools are declarative in nature. The ansible is most used tool in all other configuration tool because it more powerful and has many more features.

Importance of the training/projects: Helps to remove manual processes hence it will increase speed of SDLC. It won't affect performance of target system. This project also helps to solved real world problems. Proposed project helps to improve Availability,Scalability.

# Internship Work Details

As an intern in the LW, I got a list of tasks to complete every week after training.When I was analyzing the task then I found out that, I need to learn some other technologies to complete it. In this way I have learned different tools of DevOps and worked on different Technologies which includes AWS,Docker,Linux etc. Additionally, I developed my own projects by integrating these tools.

The tasks I undertook included:

       Analyzing problem,requirements.

       Finding efficient solution to it.

       Implementing Task.

       Writing articles on Task

## Tasks 1 :

**Write an Ansible playbook that does the following operations in the managed nodes:**

- Configure Docker.
- Start and enable Docker services.
- Pull the httpd server image from the Docker Hub.
- Run the httpd container and expose it to the public.
- Copy the html code in /var/www/html directory and start the webserver.

Link : https://www.linkedin.com/pulse/integration-docker-ansible-rh-294-linux-automation-dhiraj-bodake/

## Task 2:

**Deploy Web Server on AWS through ANSIBLE**

- Provision EC2 instance through ansible.
- Retrieve the IP Address of instance using a hashtag #dynamic inventory concept.
- Configure the webserver through ansible!

Link: https://www.linkedin.com/pulse/deploying-web-server-aws-through-ansible-dhiraj-bodake/

**Task 3 :**

**Want to create a hadoop cluster with 50 slaves in one minute.**

- Here Ansible automation comes to my mind . I am interested in using Hadoop to process large sets of data, including use of higher level abstractions. What has surprised me most is that , if i have to connect 50 slaves . In each case I start by manually provisioning some servers and then follow a series of tutorials to manually install and configure a cluster. The typical experience seems to take about a week to setup a cluster (50 slaves). There is often a lot of wasted time to deal with networking and connectivity between hosts.

- For all these problems I create an article based on ansible automation . By using ansible within couple of minutes we configure hadoop in 100 slaves .

- Also start the hadoop daemon . Not only 50 we also create clusters of more than 100.

Link: https://www.linkedin.com/pulse/ansible-hadoop-dhiraj-bodake/

**Task 4 :**

**Configuring Load Balancer on AWS using Ansible with dynamic inventory.**

- Provision EC2 instances through ansible.

- Retrieve the IP Address of instances using the dynamic inventory concept.

- Configure the web servers through the ansible role.

- Configure the load balancer through the ansible role.

- The target nodes of the load balancer should auto-update as per the status of web servers.

Link : https://www.linkedin.com/pulse/configuring-load-balancer-aws-using-ansible-dynamic-inventory-bodake/

# Learning Outcomes

- After training I have used above technologies to develop different automation scripts for k8s,Hadoop,AWS,GCP,Linux,Azure etc.

- After training I understood importance of automation because it save lot of cost of product as well as time.

- This training also gives me idea for my major project.

- It helps me to understand how quickly we can deploy any feature on live servers.

- It helps me to understand how to integrate different Technologies.

# Conclusion

From my internship at LinuxWorld, I was able to get a better understanding of how the Ansible, DevOps,SDLC works and how effective it is. I enjoyed working with the LinuxWorld and implemented different mini projects by integrating different DevOps tools.The main thing that I have learned how to approach to real world problems. Overall, I found the DevOps internship experience to be positive, and I am sure These skills definitely will help to grow in my career.

# Future Scope

- In future We will develop this scrips to create same setup over GCP and Azure etc.

- We will integrate Terraform with Ansible for performance improvement.

- We will integrate Ansible,Jenkins,Maven,k8s for JAVA based app

# References

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