

**AN INTERNSHIP ON**  
**CREATE A VPC,SUBNET AND EC2 IN IT AND WATCH CPU UTILIZATION**  
**USING CLOUD WATCH TOOL**

*An Internship report submitted to*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA, KAKINADA**

*Submitted in partial fulfillment of the requirements*

*For the award of degree*

**BACHELOR OF TECHNOLOGY**  
**IN**  
**INFORMATION TECHNOLOGY**  
**II BTECH-II SEMESTER**

**Submitted by**

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*Under the esteemed Guidance of*

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**ASSISTANT PROFESSOR**



**Department of Information Technology**

**NRI INSTITUTE OF TECHNOLOGY**  
**(AUTONOMOUS)**

**Approved by AICTE New Delhi :: Permanent Affiliation to JNTUK, Kakinada**

**Accredited by NBA (CSE, ECE &EEE), Accredited by NAAC with A-Grade**

**An ISO 9001:2015 Certified Institution**

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**(2021-2025)**



# **NRI INSTITUTE OF TECHNOLOGY** **(AUTONOMOUS)**

Approved by AICTE, New Delhi: Permanently Affiliated to JNTUK, Kakinada  
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An ISO 9001:2015 Certified Institution



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## **CERTIFICATE**

This is to certify that the "Internship report" submitted by NAGAVARAPU VINAY KUMAR (21KN1A1245), KONDURU BHARGAVI (21KN1A1230), PAIDI VASANTH SAI (21KN1A1248), is work done by them and submitted during 2022-2023 academic year, in partial fulfillment of the requirements for the award of the degree of **BACHELOR OF TECHNOLOGY in INFORMATION TECHNOLOGY**, at **ADVAITA GLOBAL -IT LABS Pvt.Ltd.**



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### **ADVAITA GLOBAL - IT LABS Pvt.Ltd**

Sub: Internship Experience Letter

Intern Id:AGIT/IN/23/11171

#### TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr/Miss/Mrs. **NAGAVARAPU VINAY KUMAR** (Intern Id: AGIT/IN/23/11171) who was employed with our organization since **13th Feb 2023 to 15th June 2023** as "Intern" in **DEVOPS** From **NRI INSTITUTE OF TECHNOLOGY** with Registered Number : **21KN1A1245** We found his technically sound, hard working and diligent during his tenure.

*The management would like to wish all the best for his future.*

*We thank you for your efforts, contribution during your tenure. We wish you all success in your future endeavors*

With best wishes,  
Sincerely,  
For Advaita Global IT Labs Pvt.Ltd.  
Naveen Vadde  
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## **ADVAITA GLOBAL - IT LABS Pvt.Ltd**

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This is to certify that Mr/Miss/Mrs. **KONDURU BHARGAVI** (Intern Id: AGIT/IN/23/11172) who was employed with our organization since **13th Feb 2023 to 15th June 2023** as “Intern” in DEVOPS From **NRI INSTITUTE OF TECHNOLOGY** with Registered Number : **21KN1A1230** We found her technically sound, hard working and diligent during her tenure.

*The management would like to wish all the best for her future.*

*We thank you for your efforts, contribution during your tenure. We wish you all success in your future endeavors*

With best wishes,  
Sincerely,  
For Advaita Global IT Labs Pvt.Ltd  
**Naveen Vadde**  
HR-Manager.  
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## **ADVAITA GLOBAL - IT LABS Pvt.Ltd**

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Intern Id:AGIT/IN/23/11173

### TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr/Miss/Mrs. **PAIDI VASANTH SAI** (Intern Id: AGIT/IN/23/11173) who was employed with our organization since **13th Feb 2023 to 15<sup>th</sup> June 2023** as “Intern” in DEVOPS From **NRI INSTITUTE OF TECHNOLOGY** with Registered Number : **21KN1A1248** We found his technically sound, hard working and diligent during his tenure.

*The management would like to wish all the best for his future.*

*We thank you for your efforts, contribution during your tenure. We wish you all success in your future endeavors*

With best wishes,  
Sincerely,  
For Advaita Global IT Labs Pvt.Ltd.  
**Naveen Vadde**  
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Mail: naveenvadde312@gmail.com

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# ACKNOWLEDGEMENT

Before getting into the thickest of things, we would like to thank the personalities who were part of my project in numerous ways, those who gave me outstanding support from birth of the project.

We are extremely thankful to our beloved chairman **Dr. R. Venkat Rao** for providing necessary infrastructure and resources for the accomplishment of our project at **NRI Institute of Technology, Agiripalli**.

We are highly indebted to **Dr. C. Naga Bhaskar**, Principal of **NRI Institute of Technology**, for his support during the tenure of the project.

We here by wish to express our deep sense of gratitude to **Dr. J. Rajendra Prasad, Professor & Head of the Department and Dr.SK. Mahaboob Basha, Professor & Academic Coordinator**, Department of Information Technology, NRI Institute of Technology for the esteemed guidance, moral support and invaluable advice provided by them for the success of the project.

With grateful thanks, I express my deep sense of gratitude and respect towards my internal guide **Mr.Ravi Kiran , Assistant Professor** , for his valuable suggestions, guidance and encouragement throughout the project.

We are also thankful to all the staff members of Information Technology department who have cooperated in making our project a success. We would like to thank all our parents and friends who extended their help, encouragement and moral support either directly or indirectly in our project work.

Thanks for Your Valuable Guidance and kind support

**Name:** NAGAVARAPU VINAY KUMAR

**Regd no:**21KN1A1245

**Name:** KONDURU BHARGAVI

**Regd no:**21KN1A1230

**Name:** PAIDI VASANTH SAI

**Regd no:**21KN1A1248

## **Organization Information:**

ADVAITA GLOBAL IT SOLUTIONS was established with the goal of fostering the growth of a vibrant ecosystem that includes individuals, research institutes, commercial enterprises, and educational establishments. The International Institute of Technology and the Government International Institute of Digital Technologies depend on it as a primary partner. It does this by providing a platform called TAPTAP AI Driven employability, which helps students change their course toward their desired goals while also supporting human resources managers in recruiting the best individuals. It is home to the most comprehensive network of center of excellence in emerging technologies in all of India. It is common knowledge that we are one of the most successful companies in India that specializes in the production of web apps. Our goal is to create web applications that are not only reliable and productive, but also perfectly cater to the requirements of each of our customers in the most fruitful manner that is open to us.

## **Programs and opportunities:**

This ground-up approach helps us deliver not only the solution to our clients but also add value to at the core which operates in Five specific domains namely Tap Tap - AI Driven, Post Graduation Programs, Center of Excellence, Virtual Programming Labs and Happie Days - A social Networking site for the students. Tap offer services in Campus Recruitment drives for the Employers as well as College authorities. Recruiters can Conduct Customized Online Assessments secured with Best-in-class Proctoring and Schedule the end- to-end hiring process. Under each division we further provide specific industry solutions on focused domains with cutting edge technologies. It emphasize on building relationships with our clients by delivering projects on time and within budget.

# **ABSTRACT**

DevOps is the portmanteau of development and operations. In recent times, the agile transformation was adopted in IT organizations for continuous integration principles in software development life cycle (SDLC) which has improved the efficiency of development in the project. With time being it has been realized that optimization does not help in continuous integration to make the software delivery process efficient. Unless all the modules in software delivery lifecycle are well designed, implemented and optimized. This is the problem with previous technologies and DevOps addresses it. This project explains the various phases of SDLC, business needs and ways to move from continuous integration to continuation delivery.

## **Learning Objectives/Internship Objectives**

- Internships are generally thought of to be reserved for college students looking to gain experience in a particular field. However, a wide array of people can benefit from training Internships in order to receive real world experience and develop their skills.
- An objective for this position should emphasize the skills you already possess in the area and your interest in learning more.
- Internships are utilized in a number of different career fields, including architecture, engineering, healthcare, economics, advertising and many more.
- Some internship is used to allow individuals to perform scientific research while others are specifically designed to allow people to gain first-hand experience working.
- Utilizing internships is a great way to build your resume and develop skills that can be emphasized in your resume for future jobs. When you are applying for a training internship, make sure to highlight any special skills or talents that can make you stand apart from the rest of the applicants so that you have an improved chance of landing the position.



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## WEEKLY OVERVIEW OF INTERNSHIP ACTIVITIES

1st WEEK	DATE	DAY	NAME OF THE TOPIC/MODULE COMPLETED
	06. 04.2023	Thursday	Module 01-Why DevOps and its usage, Agile and DevOps
	08.04.2023	Saturday	Module 02-DevOps Lifecycle, DevOps Delivery Pipeline

2nd WEEK	DATE	DAY	NAME OF THE TOPIC/MODULE COMPLETED
	10.04.2023	Monday	Module 02-Git Introduction and Overview of Version Control Systems
	11.04.2023	Tuesday	Module 02-Git file workflow and Git commands
	12.04.2023	Wednesday	Module 03-Branching and Merging
	13.04.2023	Thursday	Module 03-Understanding and build tools
	14.04.2023	Friday	Module 04-Containerization basics using Docker
	15.04.2023	Saturday	Module 04- Containerization basics using Docker - Practicals

3rd WEEK	DATE	DAY	NAME OF THE TOPIC/MODULE COMPLETED
	17.04.2023	Monday	Module 05-Continuous integration using Jenkins
	18.04.2023	Tuesday	Module 05-Continuous integration using Jenkins--Practicals
	19.04.2023	Wednesday	Module 06-Docker Commands and Use--cases
	20.04.2023	Thursday	Module 06-Docker Commands and Use--cases--Practicals
	21.04.2023	Friday	Module 07-Introduction to Kubernetes

4th WEEK	DATE	DAY	NAME OF THE TOPIC/MODULE COMPLETED
	24.04.2023	Monday	Module 07- Introduction to Kubernetes-Practicals
	25.04.2023	Tuesday	Module 08- Configuration Management using Ansible
	26.04.2023	Wednesday	Module 08- Configuration Management using Ansible-Practicals
	27.04.2023	Thursday	Module 09- Introduction to CloudWatch
	28.04.2023	Friday	Module 09- Monitoring different servers using CloudWatch
	29.04.2023	Saturday	Module 10- AWS DevOps Services

5th WEEK	DATE	DAY	NAME OF THE TOPIC/MODULE COMPLETED
	01.05.2023	Monday	Module 10- AWS DevOps Services- Practicals
	06.05.2023	Saturday	Assessment-Internship (Task will be assigned to groups)

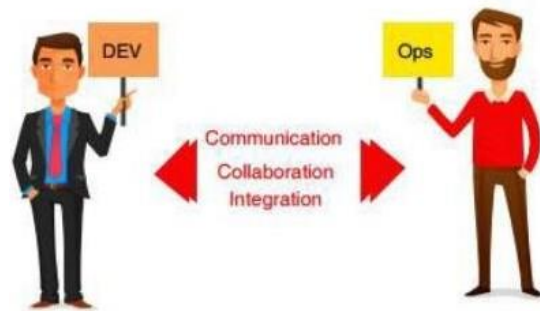
# **CHAPTER-1**

## **INTRODUCTION**

# 1.INTRODUCTION

## 1.1 CONTEXT:

Patrick Debois, who devised the name “DevOps” in 2009 and he is also called as “The Father of DevOps” devised the name “DevOps” in 2009. The word DevOps says itself that it is formed by coalescing the two words “Development” and “Operations”. DevOps is the collaboration of development and deployment of software. DevOps is the portmanteau of development and operations. It is a software development method that escalates to the amalgamation between software development team and operation team. This is the time to change the old technology to new technology like DevOps. – “Time to stop wasting money, time to start delivering great software and building systems that scale and last”—Patrick Debois.



**Figure1.1: Understanding DevOps**

The new software delivery procedure is adopted by the organizations since the market needs are changing continuously, rapid change in technology to deliver quickly. Customer waiting for 6 months or 1 year for a version to be released and giving feedback after release cannot happen nowadays. Customers need continuous engagement with the project so that they can provide the feedback continuously. In order to face the challenges, the organization should be lean and follow the agile transformation in all phases of SDLC. Over the years the organizations have adopted the agile transformation for optimization, but the evolution takes place to change the technology to DevOps. It is important to keep all the phases in pace so that the software delivery lifecycle will not be delayed. DevOps is the mechanism which bridges the gap between developer-operations and not only limited to developer-operations but also for the continuous development, continuous testing and continuous integration. DevOps main goal is to deliver the software rapidly with continuous development, continuous integration, continuous feedback and communication with development and operations team. DevOps is the extension of agile principles in software delivery pipeline. DevOps principle plays an important role in complete SDLC, but it makes sense if both the development team and operations team work in a same place.

## **CHAPTER-2**

### **RELATED WORK**

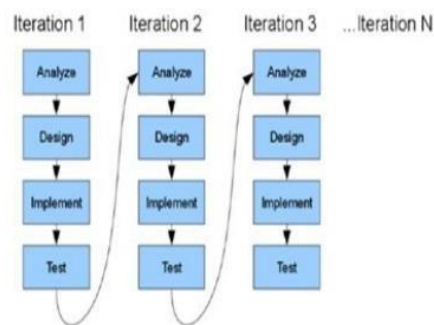
## 2.RELATED WORK

### 2.1 WATERFALL MODEL:

The first introduced Process Model is the Waterfall model. It is also referred to as a traditional model or linear-sequential life cycle model. It is very simple to understand and use. In this Waterfall model, every phase must be completed before going to the next phase and there is no issue of overlapping of phases. It is the first SDLC approach model for software development. The waterfall model illustrates the software development process flow in the linear sequential flow. The waterfall model process development is divided into separate phases and will start only after completion of the previous phase. The phases of Waterfall development model are as follows 1. Requirement gathering and Analysis 2. System Design 3. Implementation 4. Testing 5. Deployment 6. Maintenance This model is the first model developed for the software development and ensures success, but the disadvantage is that each phase should be done only after completion of the previous phase it results in a long duration and also all the requirements are to be specified before starting the project.

### 2.2 AGILE PROCESS:

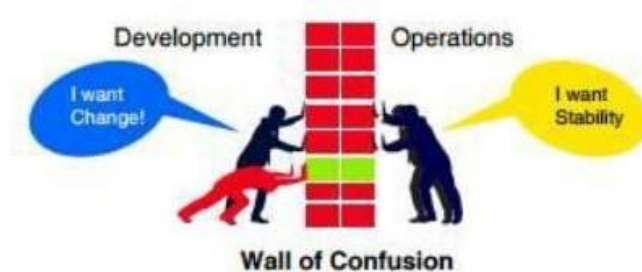
Agile software development model is the process model which is the combination of both iterative and incremental model. The agile model focuses on process adaptability and customer satisfaction by rapid development and delivery of software product [12]. It breaks the complete product into small incremental builds and these builds are completed in iterations. These iterations last for one to three weeks and involve in cross-functional product development. The teams simultaneously work on these phases 1. Planning 2. Requirement Analysis 3. Design 4. Coding 5. Unit Testing 6. Acceptance Testing This agile model after completion of system testing for the product it will be deployed in the market. It helps to complete the project rapidly. It is also suitable for static or dynamic requirements, but it does not suitable for handling complex dependencies and a high risk of sustaining, maintaining and extending.



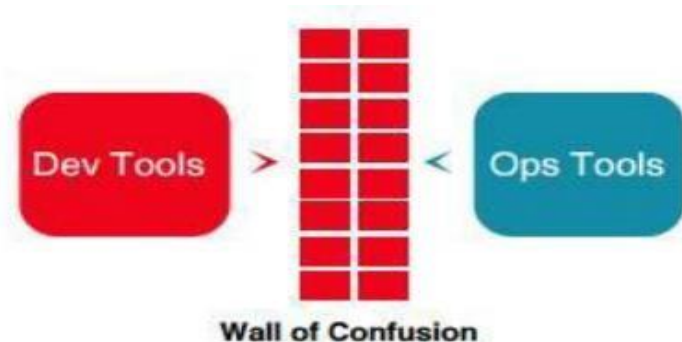
*Figure2.2: Agile Model*

## 2.3 DEVOPS AND ITS IMPORTANCE

Patrick Debois, who is called as “The Father of DevOps” devised the name “DevOps” in 2009. DevOps (a portmanteau of development and operations) is a software development method that escalates to the amalgamation between software developers and information technology (IT) operation professionals. A. DO WE REALLY NEED DEVOPS? Developers always want to deliver the changes in the product as soon as possible whereas the operation team want reliability and stability in the product. This situation was explained clearly in “wall of confusion” by Lee. This wall of confusion not only gives the mentalities of two teams but also the tools they practice. Development team uses some tools and Operations team uses different tools to perform the same task. DevOps bridge the gap between the development and operations for better and faster results.



*Figure 2.31: Wall of Confusion without DevOps*

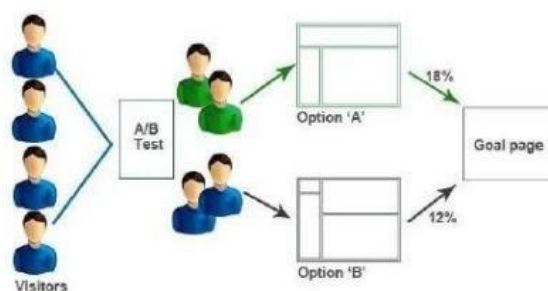


*Figure 2.32: Wall of Confusion with DevOps*

## 2.4 WHAT DRIVES THE NEED OF DEVOPS?

1. Strong collaboration between development and operation teams. 2. Synchronized deployment across multiple platforms. 3. Pressure to release applications to meet customer requirements or to enter into the new market. 4. Improving end user capability levels. 5. Vast usage of smart devices. 6. Necessity to develop and deploy into cloud-based applications. 7. Increasingly complex IT infrastructure. 8. Need to reduce the cost for IT industry principles in the complete software deployment process to enhance the speed of delivery of product or service from the initial release to the production release and to the feedback given by the client based on the release. DevOps return our investment in these three areas 1. Enhanced Customer Experience Delivering an enhanced product for the customer leads to build loyalty and increase in market share. To deliver an enhanced product we need to continuously obtain and respond to the customer's feedback faster and perform required changes suggested by the customer.

2. Increased capacity to Innovate Lean thinking approaches are used in modern organizations to increase their innovation capacity. Their goals are to utilize the resources efficiently for other activities by reducing waste and rework. An example of lean thinking in organization is A-B testing in which large organizations asks a small group of users to test and rate two or more sets of software having different capabilities then the better capability set is picked up for the users and unsuccessful version is rolled back. This A-B testing is reliable only if efficient and automated mechanisms are adopted such as DevOps



**Figure 2.4: A-B Testing**

A-B testing is the comparison of two web pages to know which will perform fast and efficient. It is also called as split testing. We compare two web pages by showing the two variants (let's call them A and B) to similar visitors at the same time. The one which has more conversion rate is accepted.

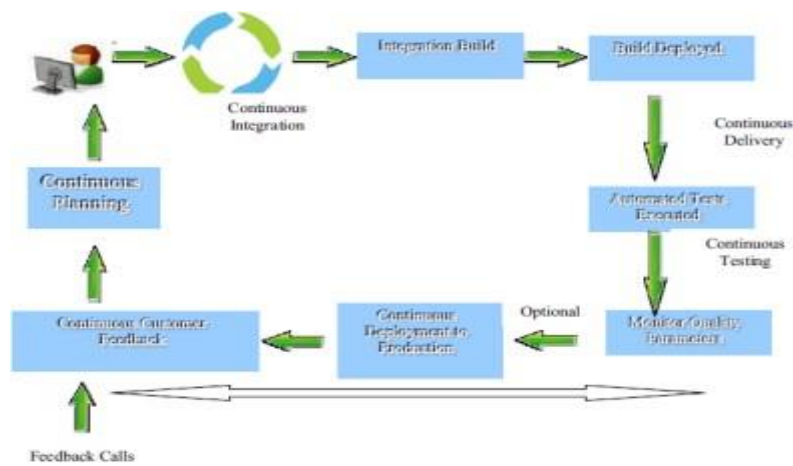


3. Faster time to value: This involves in development of new culture and practices and automating the project leads to fast and reliable delivery process throughout the production phase. This DevOps can be worked as a business capability with the tools for release planning, predictability and success. The DevOps main goal is to deliver the value faster and in efficient way and the value definition changes with organization or with the project.

## **2.5 DEVOPS PHASES AND DELIVERY PIPELINE**

- A. Continuous Planning Business plans are already using agile methodologies to deliver quickly and change according to market conditions. It is better to have the checkpoints so that we can easily do the necessary changes given as feedback by customer. Dev / Test teams adapting to quick changes is not an easy task in business environments. DevOps allows us to prioritize the product backlogs and taking business perspective into consideration. This is the continuous process of planning, executing, getting feedback from the customer, the cycle continues.
- B. Continuous Integration Continuous Integration means dynamically integrating the changes made to the project to the team and not restricted to our local machine and validates the behaviour of the code. Sharing with component teams but integrating beyond component boundaries at product integration level. Further the process optimization refers to automation as soon as the developer delivers the change build systems must detect the change and trigger a build taking sanity test and building repository. This must be a cyclic process across the development [9, 10].
- C. Continuous Deployment Continuous Deployment is the heart of the DevOps and acts as the Centre point to the complete software delivery optimization. Most of the surveys said that in many organizations the reason for the delay in software delivery is the operations. Hardware setting in the development build may vary from days to weeks. These deployment processes are inconsistent and manual. DevOps principles recommend the automation of deployment and hardware provision and cloud play a vital role in this field. DevOps proposes a concept called Infrastructure as a code (IAAC) which says that complete infrastructure provision should be maintained in source code repository.
- D. Continuous Testing Automation is the best option for continuous testing to test every test case. If any process need to do repeatedly for some constant time it is better to automate that process. They are humongous applications available in the market for do that type of

testing process to meet the goal. There will be a chance of maximum to automate the manual testing process we need to evaluate on the same. Software delivery process must be able to execute the test suite automatically with the user intervention leading towards the goal reach easily. This kind of process not only makes testing process automate but also allows test cases to be carried out fast in production like system (deployment). Continuous Monitoring As discussed in all the above approaches we adopted, there is a chance to observe various parameters and react to them accordingly. The capability to test early and production like systems we can react to them in timely manner.



**Figure 2.5: Delivery Pipeline**

DevOps approach delivery pipeline is shown in above figure. It can be compared with manufacturing unit delivery pipeline. Each build / release should undergo this cycle of dev -fvt - regression - stage - production - test phases by clearing all the quality parameters. With this automated pipeline there will be consistent releases.

## **CHAPTER-3**

### **TOOLS USED**

### 3. TOOLS USED

#### **GIT SOFTWARE:**

Git is a version control system for tracking the changes in the local machine or the distributed system among the multiple people in the project. Its primary use is to Source code management (SCM) in software development but it is able to track the any number of changes done in the project. In distributed system its aim is to provide the speed, data.

#### **JENKINS:**

Jenkins is a continuous integration (CI) server or a tool written in java language. It is open source software for download. The continuous integration services can be provided for software development which can be done via command line or web application server.

#### **ANSIBLE:**

Ansible is the automation software that provides configuration management, software provisioning and application deployment. A platform was created by the Michael Dehaan, who is the author of the provisioning server application cobbler and a co-author of the fun framework for remote administration. It is the part of Fedora Linux which is owned by Red Hat Inc., and is available for the Red hat Enterprise Linux, Cent OS, Oracle Linux via extra packages for Enterprise Linux (EPEL), Scientific Linux and for remaining OS's also. It is used for automating the tasks like software installation etc.,

#### **APACHE MAVEN:**

It is a Software Management tool works with Project Object Model (POM). It is used as a reporting, building, documenting from an informational central source point and can be used for building Java based projects.

#### **DOCKER:**

It is a container management service. The keywords of Docker are **develop, ship** and **run** anywhere. The whole idea of Docker is for developers to easily develop applications, ship them into containers which can then be deployed anywhere.

Docker is **an opensource platform that enables developers to build, deploy, run, update and manage containers** standardized, executable components that combine application source code with the operating system (OS) library and dependencies required to run that code in any environment.

# **CHAPTER-4**

## **SOFTWARE**

### **REQUIREMENTS**

## 4.

## SOFTWARE REQUIREMENTS

### SYSTEM CONFIGURATION:

The software requirement specification can produce at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by established a complete information description, a detailed functional description, a representation of system behavior, and indication of performance and design constrain, appropriate validate criteria, and other information pertinent to requirements.

#### 4.1.1 Software Requirements:

- ❑ Operating system : Windows / Linux.
- ❑ Coding Language : No
- ❑ Platform : AWS.

#### 4.1.2 Hardware Requirement:

- ❑ System : Core i5 2.4 GHz.
- ❑ Hard Disk : 1TB.
- ❑ Ram : 8GB.

## **CHAPTER-5**

### **LITERATURE REVIEW**

## 5.

## LITERATURE REVIEW

**Python** is a high-level, interpreted, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation.

Python is dynamically-typed and garbage-collected. It supports multiple **Programming** including structured (particularly procedural), object- oriented and functional programming. It is often described as a "batteries included" language due to its comprehensive standard library.

- **Creating a web Server:**

One of the most popular beginner-level DevOps projects is to create a Web Server. When a client requests content from a website, a web server saves it and sends it to them. It responds to client queries sent via the World Wide Web using the HTTP (Hypertext Transfer Protocol) and other protocols

For this project, the first step is to create a basic HTTP server

- **Java Application with Jenkins:**

Jenkins is a build automation tool. It is mainly known for its flexibility and developers can use it to create almost any kind of software.

For this project, you must generate a Jenkins build definition file and ‘build’ the java application. After constructing the application, the configuration of jenkins can be executed to do a straightforward automated test.

With the help of this project, you can learn how to build a java application in an archive and how to run it.

- **Project on Jenkins Remoting:**

Jenkins is DevOps automation tool that is mainly used for testing and building software. It is open-source and is written in Java. With the help of Jenkins software, developers can build such pipelines that follow CI/CD (Continuous Integration/Continuous Delivery) workflows.



Jenkins' communication layer is implemented using Jenkins Remoting, an executable JAR and library. This project aims to improve Jenkins remoting. It requires knowledge of Java, message queues, and networking basics, which makes it an amazing project idea for networking enthusiasts

## ❓ **Implementing DevOps Lifecycle with AWS**

You'll be storing the source code for the application in this project using AWS Developer Tools. The software will therefore be created, examined, and deployed automatically on AWS or in your on-premises environment. To create a continuous delivery pipeline that makes use of AWS Code Build or Code Deploy, you may start with the AWS Code Pipeline.

### • **Build a Scalable Application**

Through this application, you will gain valuable insight into application architecture and the reasons for its significance via this assignment. Your task is to create a scalable application by creating a robust foundation based on well-defined principles.

By avoiding greater code maintenance costs and deployment concerns, the final application able to develop and grow to meet the demands of the business.

# **CHAPTER-6**

## **METHODOLOGY**

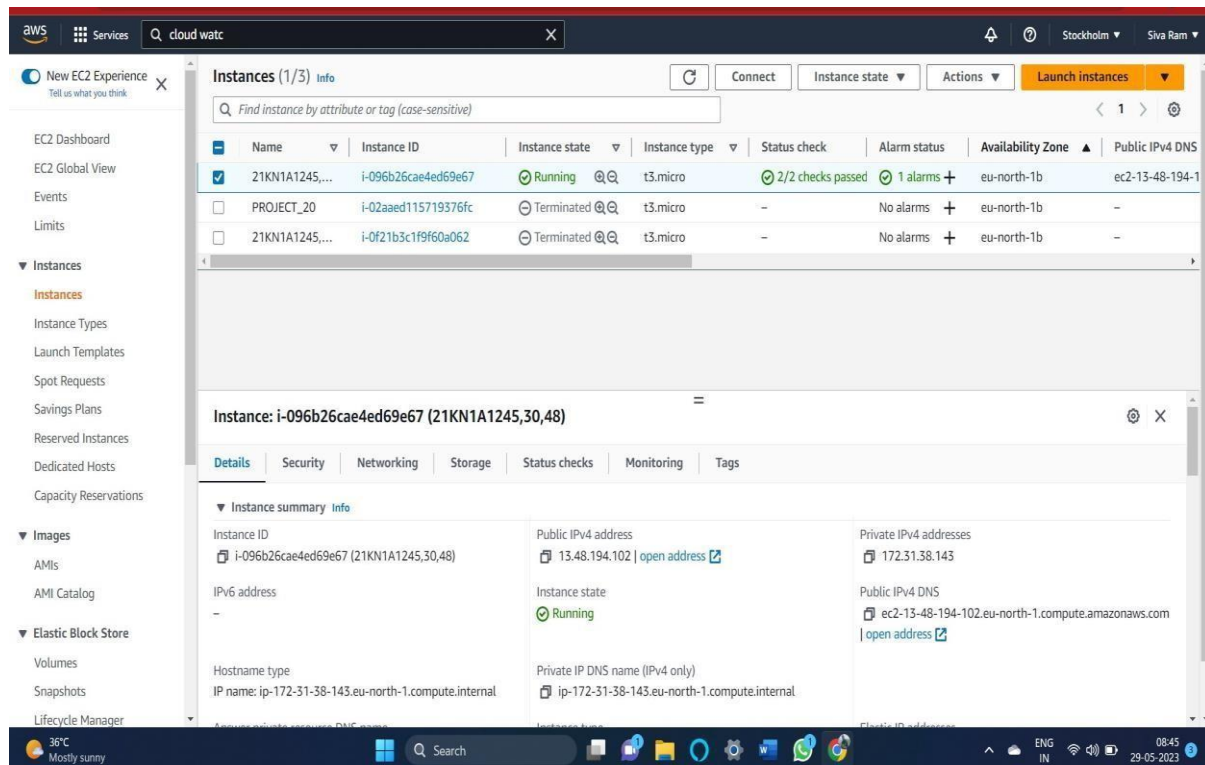


Fig:- Instance in AWS Console

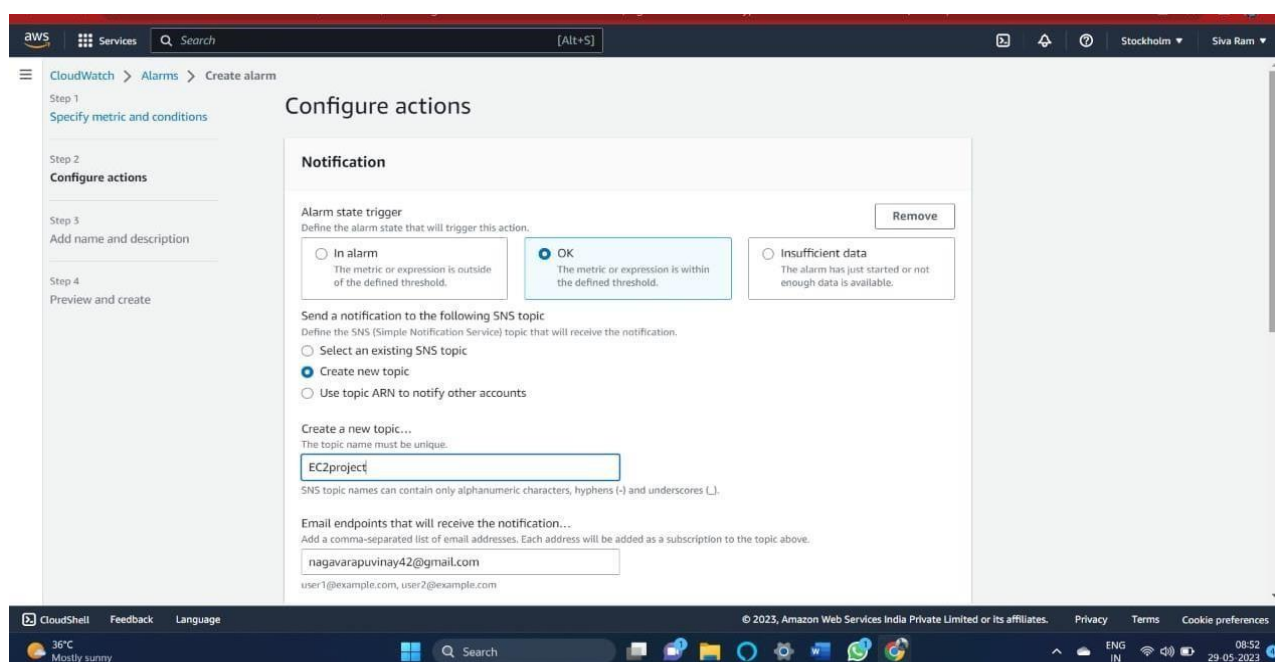


Fig:- After Creating the Instance go to Cloud Watch Tool

CloudWatch Management Console

Search [Alt+S]

ms > Create alarm

## Configure actions

### Notification

Alarm state trigger  
Define the alarm state that will trigger this action.

☐ In alarm  
The metric or expression is outside of the defined threshold.

☒ OK  
The metric or expression is within the defined threshold.

☐ Insufficient data  
The alarm has just started or not enough data is available.

Remove

Send a notification to the following SNS topic  
Define the SNS (Simple Notification Service) topic that will receive the notification.

☐ Select an existing SNS topic

☒ Create new topic

☐ Use topic ARN to notify other accounts

Create a new topic...  
The topic name must be unique.

EC2project

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (\_).

Email endpoints that will receive the notification...  
Add a comma-separated list of email addresses. Each address will be added as a subscription to the topic above.

nagavarapuvinyay42@gmail.com

user1@example.com, user2@example.com

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Fig:- Alarm Using the Instance id And Give Maximum 5 min

aws Services Search [Alt+S]

Stockholm M. LAASYA SRI

Statistic

Maximum

Period

5 minutes

### Conditions

Threshold type

☒ Static  
Use a value as a threshold

☐ Anomaly detection  
Use a band as a threshold

Whenever CPUUtilization is...  
Define the alarm condition.

☐ Greater  
> threshold

☒ Greater/Equal  
≥ threshold

☐ Lower/Equal  
≤ threshold

☐ Lower  
< threshold

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38°C Mostly sunny 14:35 27-05-2023

CloudWatch Management Console

th-1.console.aws.amazon.com/cloudwatch/home?region=eu-north-1#alarmsV2:create?~(Page~'Actions~AlarmType~'MetricAlarm~AlarmData~(Namespace~'AWS'2IEC2~MetricName~'CP...)

Search [Alt+S]

Stockholm Siva Ram

ms > Create alarm

Conditions

ption

## Configure actions

### Notification

**Alarm state trigger**  
Define the alarm state that will trigger this action.

☐ In alarm  
The metric or expression is outside of the defined threshold.

☒ OK  
The metric or expression is within the defined threshold.

☐ Insufficient data  
The alarm has just started or not enough data is available.

Remove

**Send a notification to the following SNS topic**  
Define the SNS (Simple Notification Service) topic that will receive the notification.

☐ Select an existing SNS topic

☒ Create new topic

☐ Use topic ARN to notify other accounts

**Create a new topic...**  
The topic name must be unique.

EC2project

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (\_).

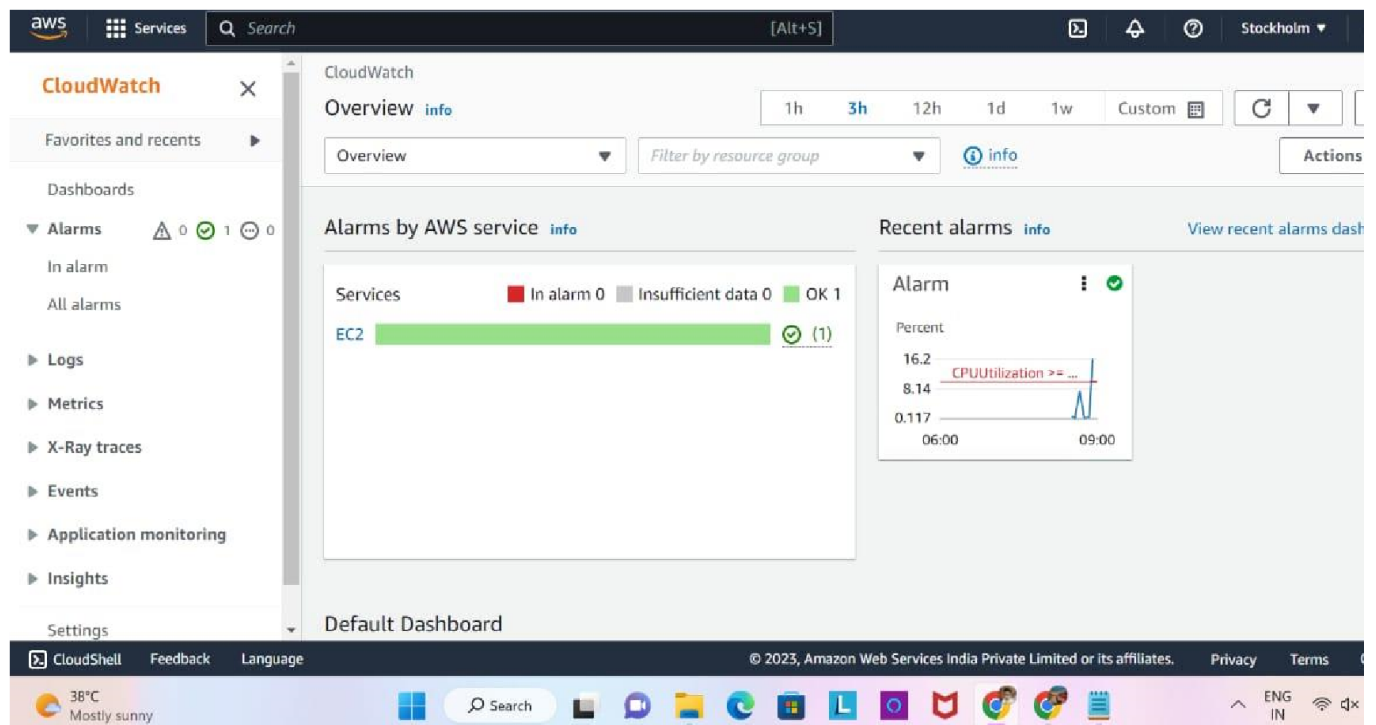
**Email endpoints that will receive the notification...**  
Add a comma-separated list of email addresses. Each address will be added as a subscription to the topic above.

nagavarapuvinay42@gmail.com

user1@example.com, user2@example.com

Language

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aws

Services

Search

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Siva Ram

Step 2  
Configure actions

Step 3  
Add name and description

Step 4  
Preview and create

Metric

Edit

Graph

This alarm will trigger when the blue line goes above the red line for 1 datapoints within 5 minutes.

Percent

0.273

0.253

0.233

00:30

01:30

02:30

CPUUtilization

Namespace

AWS/EC2

Metric name

CPUUtilization

InstanceId

i-0f21b3c1f9f60a062

Instance name

21KN1A1245,30,48

Statistic

Average

Period

5 minutes

Conditions

CloudShell

Feedback

Language

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Search

ENG

IN

08:49

29-05-2023

# **CHAPTER-7**

## **RESULT**

Services

cloud watc

Stockholm

Siva Ram

New EC2 Experience

Tell us what you think

EC2 Dashboard

EC2 Global View

Events

Limits

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Instances (1/3) Info

Find instance by attribute or tag (case-sensitive)

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
<input checked="" type="checkbox"/>	21KN1A1245,...	i-096b26cae4ed69e67	Running	t3.micro	2/2 checks passed	1 alarms +	eu-north-1b	ec2-13-48-194-1
<input type="checkbox"/>	PROJECT_20	i-02aaed115719376fc	Terminated	t3.micro	-	No alarms +	eu-north-1b	-
<input type="checkbox"/>	21KN1A1245,...	i-0f21b3c1f9f60a062	Terminated	t3.micro	-	No alarms +	eu-north-1b	-

Instance: i-096b26cae4ed69e67 (21KN1A1245,30,48)

Details

Security

Networking

Storage

Status checks

Monitoring

Tags

Instance summary Info

Instance ID

i-096b26cae4ed69e67 (21KN1A1245,30,48)

Public IPv4 address

13.48.194.102 | open address

Private IPv4 addresses

172.31.38.143

IPv6 address

-

Instance state

Running

Public IPv4 DNS

ec2-13-48-194-102.eu-north-1.compute.amazonaws.com | open address

Hostname type

IP name: ip-172-31-38-143.eu-north-1.compute.internal

Private IP DNS name (IPv4 only)

ip-172-31-38-143.eu-north-1.compute.internal

36°C

Mostly sunny

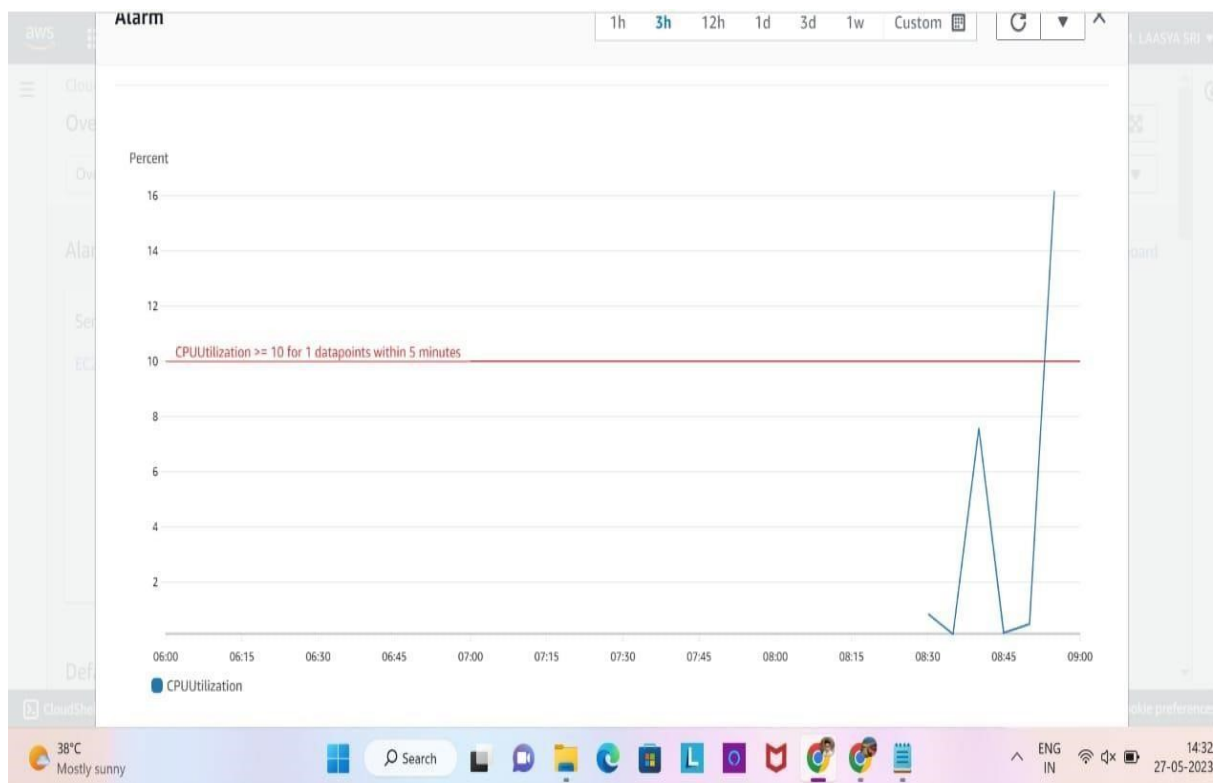
Search

ENG IN

08:45

29-05-2023





aws

Services

Search

[Alt+S]

Stockholm

M. LAASYA SRI

CloudWatch

Favorites and recents

Dashboards

Alarms 

1

0

0

In alarm

All alarms

Logs

Metrics

X-Ray traces

Events

Application monitoring

Insights

Settings

CloudWatch

Overview [info](#)

1h 3h 12h 1d 1w Custom

Overview  Filter by resource group [Info](#)

Actions

Alarms by AWS service [info](#)

Recent alarms [info](#) [View recent alarms dashboard](#)

Services 

In alarm 1 Insufficient data 0 OK 0

EC2 

(1)

Alarm

Percent

16.2

8.14

0.117

CPUUtilization >=

06:30 09:25

Default Dashboard

CloudShell Feedback Language

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38°C Mostly sunny

Search

ENG IN 15:00 27-05-2023

OK: "Alarm" in EU (Stockholm) - x Subscription confirm x +

mail.google.com/mail/u/0/?tab=rm&ogbl#imp/FMfcgzGsmqvRMcDgLbvGhnWBTzkrRpIX

Gmail is:important

Compose

Inbox 1,391

Starred

Snoozed

Sent

Drafts 17

Less

Important

Chats

Scheduled

All Mail

Spam

Bin

Categories

Manage labels

OK: "Alarm" in EU (Stockholm) Inbox x

AWS Notifications <no-reply@sns.amazonaws.com> 14:31 (5 minutes ago) ☆ ↶ ⋮

to me

You are receiving this email because your Amazon CloudWatch Alarm "Alarm" in the EU (Stockholm) region has entered the OK state, because "Threshold Crossed: 1 out of the last 1 datapoints [0.4750079167986133 (27/05/23 08:56:00)] was not greater than or equal to the threshold (10.0) (minimum 1 datapoint for ALARM -> OK transition)." at "Saturday 27 May, 2023 09:01:44 UTC".

View this alarm in the AWS Management Console:  
<https://eu-north-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=eu-north-1#alarmsV2:alarm/Alarm>

Alarm Details:

- Name: Alarm
- Description: This is Alarm which tells us the CPU Utilization
- State Change: ALARM -> OK
- Reason for State Change: Threshold Crossed: 1 out of the last 1 datapoints [0.4750079167986133 (27/05/23 08:56:00)] was not greater than or equal to the threshold (10.0) (minimum 1 datapoint for ALARM -> OK transition).
- Timestamp: Saturday 27 May, 2023 09:01:44 UTC
- AWS Account: 327595946815
- Alarm Arn: arn:aws:cloudwatch:eu-north-1:327595946815:alarm:Alarm

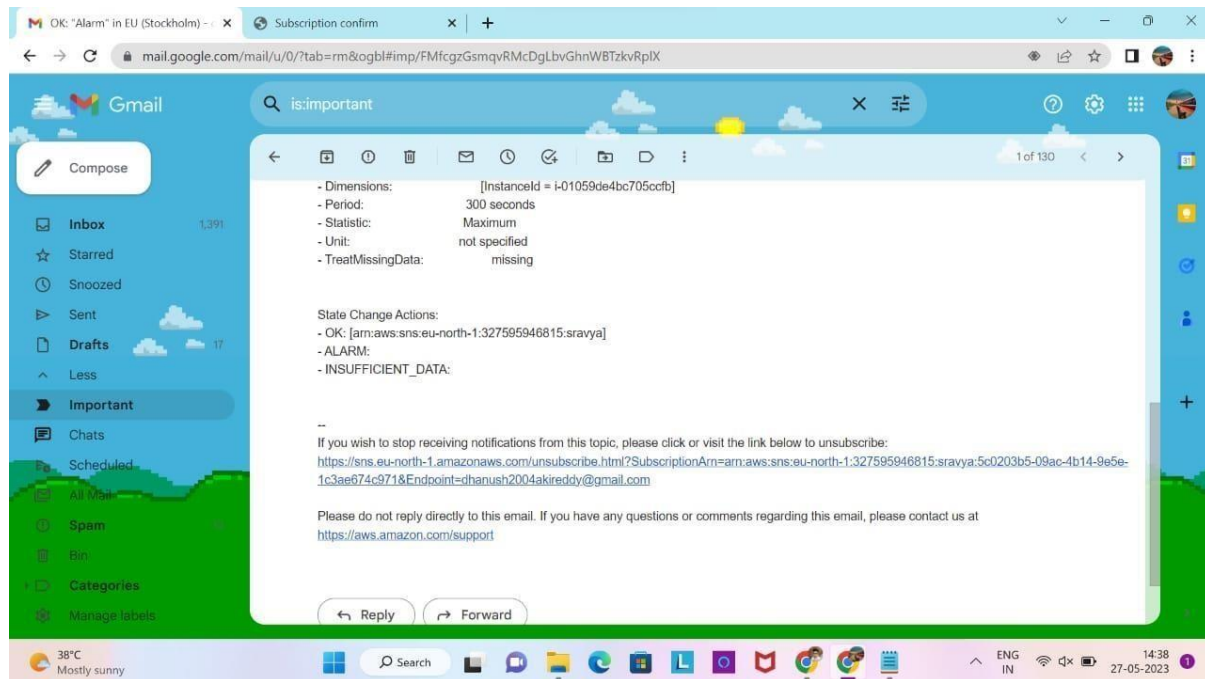
Threshold:

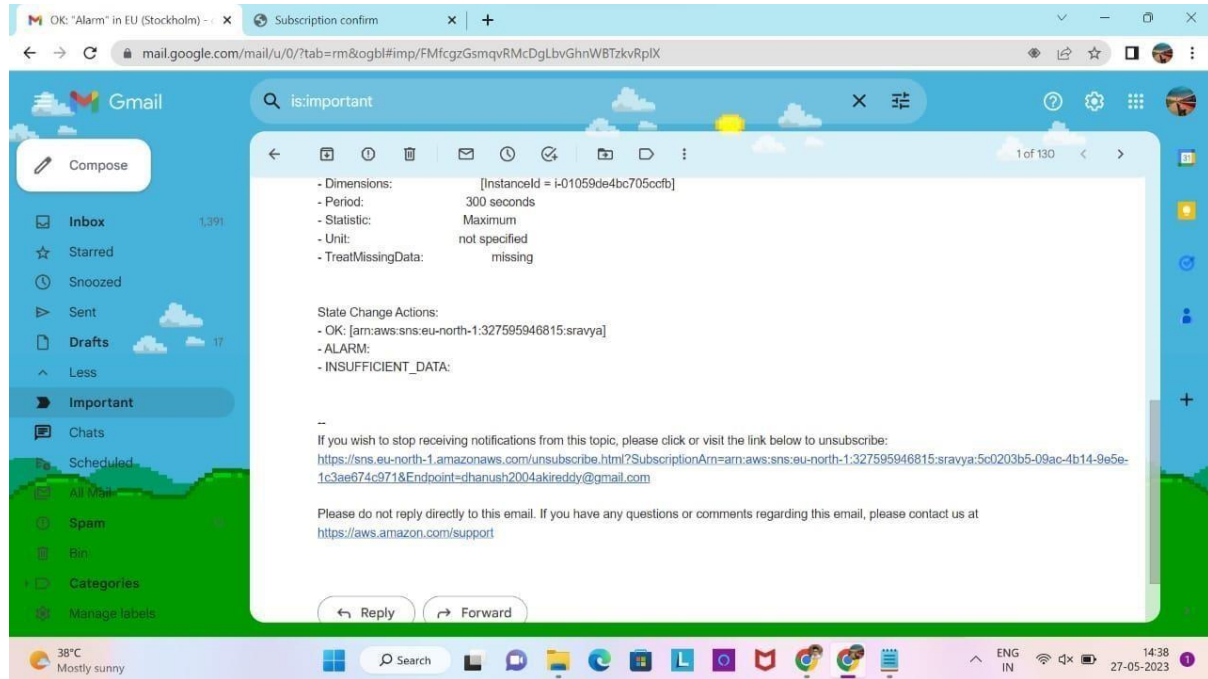
38°C Mostly sunny

Search

ENG IN

14:37 27-05-2023





# **CHAPTER-8**

## **CONCLUSION**

## .CONCLUSION

In conclusion, creating your own Virtual Private Cloud (VPC), subnet, and creating an image using a Dockerfile and pushing it to Docker Hub can be a powerful combination for managing and deploying our applications in a cloud environment.

Let's summarize the key points:

**Virtual Private Cloud (VPC):** A VPC allows you to create your own private network in the cloud. It provides isolation and security for your resources and enables you to define your own IP address range, subnets, and routing tables.

**Subnet:** A subnet is a range of IP addresses within a VPC. It helps in dividing the VPC into smaller, manageable networks. You can configure access control, routing, and security settings for each subnet.

**Dockerfile:** A Dockerfile is a text file that contains instructions for building a Docker image. It specifies the base image, environment variables, dependencies, and commands needed to set up your application environment.

**Docker Hub:** Docker Hub is a cloud-based registry service that allows you to store and distribute Docker images. It serves as a central repository for sharing and managing container images.

To create your own VPC, subnet, and Docker image and push it to Docker Hub, we can follow these steps:

**Set up a VPC:** Choose a cloud provider , and create a VPC. Define the IP address range for your VPC and set up subnets within the VPC.

**Create a Dockerfile:** Write a Dockerfile that describes the steps to build your application's environment. Specify the base image, install dependencies, copy your application code, and define the commands to run your application.

**Build the Docker image:** Use the Docker CLI (Command-Line Interface) to build the Docker image from the Dockerfile. This process involves executing the instructions in the Dockerfile and creating a reproducible image.

**Tag the Docker image:** Tag the built Docker image with a name and version to uniquely identify it. This helps in organizing and managing your images.

**Push the Docker image to Docker Hub:** Log in to Docker Hub, create a repository for your image, and push the tagged image to the repository. This step makes your Docker image available for distribution and deployment.

**Pull and run the Docker image:** In another environment or on a different machine, you can pull the Docker image from Docker Hub and run it using the Docker runtime. This allows you to deploy your application in

a consistent and reproducible manner.

By combining these steps, we can create a VPC and subnet to provide a secure network environment for our applications. Additionally, building a Docker image using a Dockerfile allows us to package our application with its dependencies, making it portable and easily deployable. Finally, pushing the Docker image to Docker Hub enables easy distribution and sharing of our containerized application with others.



# **CHAPTER-9**

## **CHALLENGES**

### **FACED**

## 9. CHALLENGES FACED

Challenges you might face during this process cloud include When working with cloud services, including creating a VPC and deploying a web server, you may encounter several challenges. Here are some common challenges you might face during the process:

**9.1 Complexity and Learning Curve:** Cloud platforms can be complex, and there is a learning curve associated with understanding their concepts, terminology, and various services. Familiarizing yourself with the cloud provider's documentation and learning resources is essential.

**9.2 Configuration Errors:** Mistakes in configuring VPC settings, subnets, security groups, or other networking components can lead to connectivity issues or security vulnerabilities. Doublechecking your configuration and understanding the implications of each setting is important to avoid errors.

**9.3 Networking and Connectivity:** Establishing connectivity between different components within the VPC, setting up proper routing, and ensuring external connectivity can be challenging. Troubleshooting network connectivity issues can require in-depth knowledge of networking principles and troubleshooting techniques.

**9.4 Security and Compliance:** Maintaining security in the cloud environment involves understanding and implementing proper security measures. This includes managing access controls, configuring firewalls, encrypting data, and staying updated with security best practices. Compliance with industry or regulatory standards may also add complexity to the process.

**9.5 Resource Limitations and Scaling:** Cloud services often have resource limits, such as the maximum number of instances, storage capacity, or network throughput. Scaling the infrastructure to handle increasing traffic or workload demands may require careful planning and implementation of scalability measures.

**9.6 Cost Management:** Monitoring and managing costs can be challenging in the cloud, especially when dealing with dynamic workloads or instances that are not properly optimized. Understanding pricing models, utilizing cost management tools, and regularly reviewing resource usage are crucial for cost optimization.

**9.7 Availability and Resilience:** Designing a highly available and resilient architecture can be complex. Ensuring proper redundancy, fault tolerance, and implementing disaster recovery strategies are important to minimize downtime and ensure business continuity.

**9.8 Performance Optimization:** Optimizing the performance of your web server and associated resources may involve fine-tuning configurations, implementing caching mechanisms, and optimizing database queries. Identifying and resolving performance bottlenecks can be a challenging task.

**9.9 Monitoring and Troubleshooting:** Implementing effective monitoring and logging mechanisms is vital for detecting and diagnosing issues. Troubleshooting problems related to connectivity.

## **CHAPTER-10**

## **FUTURE SCOPE**

## 10.FUTURE SCOPE

The Future Scope of creating your own VPC (Virtual Private Cloud), subnets, and managing Docker images using Dockerfiles and pushing them to Docker Hub is as follows

### *10.1 DevOps and Continuous Integration/Continuous Deployment*

(CI/CD): DevOps practices emphasize automation and collaboration between development and operations teams. Docker containers and Dockerfiles play a significant role in building and deploying applications in a consistent and reproducible manner. Pushing Docker images to Docker Hub, a popular container registry, enables seamless integration with CI/CD pipelines, facilitating continuous integration, testing, and deployment workflows.

**10.2 Cloud Computing Adoption:** The adoption of cloud computing is growing rapidly, and organizations are increasingly moving their applications and infrastructure to the cloud. Creating your own VPC and subnets allows you to have a dedicated network environment within the cloud provider, ensuring enhanced security and control over your resources.

**10.3 Microservices Architecture:** Microservices architecture has become a popular approach for building scalable and flexible applications. Docker containers play a crucial role in deploying microservices, as they provide lightweight and isolated execution environments. Being able to create custom Docker images using Dockerfiles allows you to package your application and its dependencies efficiently.

### *10.4 DevOps and Continuous Integration/Continuous Deployment*

(CI/CD): DevOps practices emphasize automation and collaboration between development and operations teams. Docker containers and Dockerfiles play a significant role in building and deploying applications in a consistent and reproducible manner. Pushing Docker images to Docker Hub, a popular container registry, enables seamless integration with CI/CD pipelines, facilitating continuous integration, testing, and deployment workflows.

**10.5 Container Orchestration:** Container orchestration platforms, such as Kubernetes, have gained widespread adoption for managing containerized applications at scale. Understanding how to create and manage Docker images allows you to leverage container orchestration platforms effectively. You can deploy your custom Docker images to Kubernetes clusters, ensuring efficient resource utilization and high availability of your applications.

**CHAPTER-11**  
**REFERENCES &**  
**APPENDIX**

## 11.1 REFERENCES:- •

Docker User Guide: <https://docs.docker.com>

- Tutorial basic Docker commands:  
<https://www.docker.com/tryit/> • Docker

Hub:

<https://hub.docker.com>

- Other references:  
[https://www.tutorialspoint.com/docker/docker\\_hub.htm](https://www.tutorialspoint.com/docker/docker_hub.htm)

## 11.2 APPENDIX:-

- To install docker  
yum install docker -y
- Check if image is present in hub or not  
docker images
- Run an image  
Docker run imagename
- vi Dockerfile
- docker build -t imagename .
- Login to Docker Hub docker login username: password: