Cloud Engineering and DevOps

A Summer Internship Report submitted in partial fulfilment of the requirements for the award of degree of

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING

Submitted By:

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Department Of Computer Science and Engineering

IDEAL INSTITUTE OF TECHNOLOGY

APPROVED BY AICTE, AFFILIATED TO JNTUK, KAKINADA

VIDYUT NAGAR, KAKINADA-533003, E.G.D.T, ANDHRA PRADESH

(2023-2024)

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CERTIFICATE

This is to hereby certify that the "**Internship report"** entitled *"***Cloud Engineering and DevOps***"* is the work done and submitted by **Meduri Sri Sai Venkata Lakshmi Aiswarya (216K1A0571)** in partial fulfilment of the requirements for award of the **BACHELOR OF TECHNOLOGY** degree in **CSE** for the academic year 2023-2024.

Internship Coordinator:

Mr. P. Nagaraju

Head of the Department:

Mr. M.S.R.S Prasad, M. Tech (Ph.D)

HOD

External Examiner

DECLARATION FORM

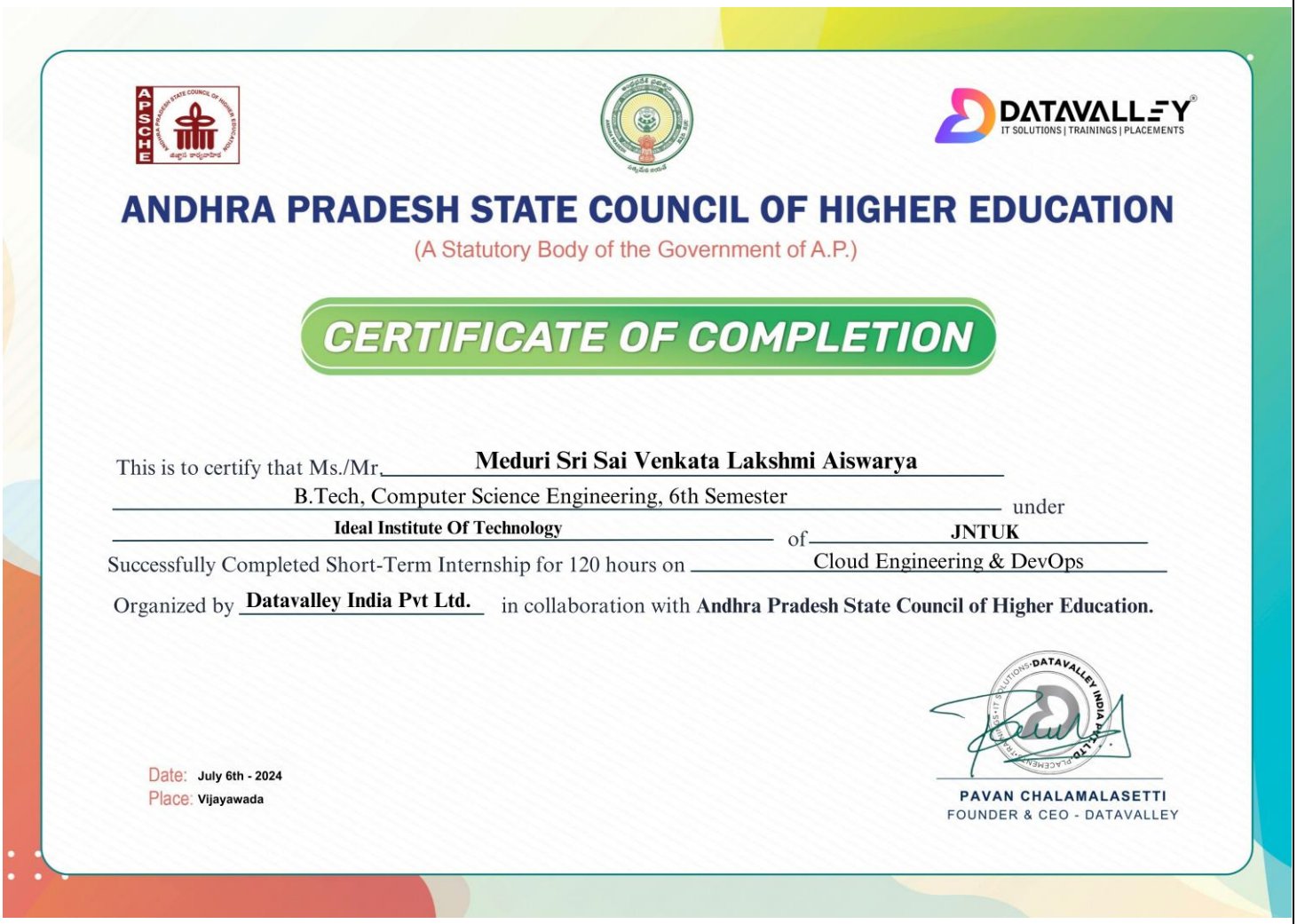
I, **MEDURI SRI SAI VENKATA LAKSHMI AISWARYA (216K1A0571)** student of B.Tech, CSE, Ideal Institute of Technology hereby declare that the Internship entitled **"Cloud Engineering and DevOps"** is genuine. This work has been submitted to the **IDEAL INSTITUTE OF TECHNOLOGY,** Kakinada, permanently affiliated to **JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, KAKINADA** in partial fulfilment of the **B.Tech** degree**.** We further declare that this project work has not been submitted in full or part of the award of any degree of this or any other educational institutions.

By

Meduri S S V L Aiswarya

216K1A0571

Internship Completion Certificate



ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory Body of the Government of A.P.)

CERTIFICATE OF COMPLETION

This is to certify that Ms./Mr. **Meduri Sri Sai Venkata Lakshmi Aiswarya**

B.Tech, Computer Science Engineering, 6th Semester under

Ideal Institute Of Technology of **JNTUK**

Successfully Completed Short-Term Internship for 120 hours on Cloud Engineering & DevOps

Organized by **Datavalley India Pvt Ltd.** in collaboration with **Andhra Pradesh State Council of Higher Education.**

Date: July 6th - 2024

Place: Vijayawada

PAVAN CHALAMALASETTI

FOUNDER & CEO - DATAVALLEY

I, **MEDURI SRI SAI VENKATA LAKSHMI AISWARYA** bearing **216K1A0571** of B.Tech in **COMPUTER SCIENCE AND ENGINEERING** student of **IDEAL INSTITUTE OF TECHNOLOGY,KAKINADA**.

I successfully completed SUMMER INTERNSHIP through "Cloud Engineering and DevOps" during the period of 6 weeks (May- July 2024).

NATIONAL INTERNSHIP PORTAL

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All India Council for Technical Education

EduSkills®
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Certificate of Virtual Internship

This is to certify that

MEDURI SRI SAI VENKATA LAKSHMI AISWARYA

Ideal Institute of Technology

has successfully completed 10 weeks

AI-ML Virtual Internship

During July - September 2024

Supported By : **India Edu Program**

Google for Developers

Karthik Padmanabhan
Developer Ecosystem Lead
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INTERNSHIP GRADE E

GRADE- O (Outstanding):90-100 | E (Excellent):80-89 | A (Very Good):70-79 | B (Good): 60-69 | C (Fair): 50-59 | D (Average): 40-49 | P (Pass): 30-39 | F (Fail): Below 30

ACKNOWLEDGEMENT

It gives us an immense Pleasure to express a deep sense of gratitude to our internship coordinator ***P.NAGARAJU***, Assistant Professor, Department of Computer Science and Engineering , because of his whole heartedness and invaluable guidance throughout the report. Without his sustained and sincere effort, this report would not have taken this shape. He encouraged and helped us to overcome various difficulties that we have faced at various stages of our report.

We would like to sincerely thank ***M.S.R.S Prasad*****,** Associate Professor & HOD , Computer Science and Engineering , for providing all the necessary facilities that led to the successful completion of our report.

Finally, we would like to thank all of our friends and family members for their continuous help and encouragement.

ABSTRACT

- The "**Cloud Engineering and DevOps Internship**" will give learners an immersive experience in the design, deployment, and operation of scalable, secure, cost-efficient cloud infrastructures following the adoption of **DevOps** practices to optimize software development and delivery pipelines.

- It involves the practical application of principles for cloud and DevOps, including **infrastructure as code** (IaC), **continuous integration/continuous deployment** (CI/CD), and automation for most cloud service providers and platforms. Interns work on real-world tasks such as provisioning cloud resources, optimizing workload performance, and streamlining development workflows to enhance operational efficiency and agility.

- This involved participants using industry-standard toolings and technologies such as **Terraform** for IaC; **Jenkins and GitHub Actions** inCI/CD; Docker for containerizing items, and **Kubernetes** for the orchestration of all containerized items. It has also developed skills in configurations that monitor solutions, logs-which constitute implementing logging mechanisms- and that which ensures disaster recovery.

- Main features involved are **virtual network building**, handling of cloud storage solutions and its optimiz ation, automated implementation pipeline, and security policies implementations. There is always a rigid imposition of some fundamental **principles such as scalability, fault tolerance, and high availability**.

- Implementing cost management strategies and other measures to ensure compliance and secure operation are part of the focus on internships. Bringing into view the **IAM and RBAC** forms of security are also i ncluded as part of the program for integrating theoretical concepts with practical exposure, thus equipping participants with the expertise that they may employ in dealing with modern-day challenges in **Cloud and DevOps** in pursuit of their success in a technology arena characterized by rapid evolution.

Learning Objectives/Internship Objectives

- This **Cloud Engineering and DevOps internship** will involve practical experience in designing and managing cloud infrastructures while keeping DevOps practices in mind-bridging the gap from theoretical know-how to real-life application. The goal for the position itself would be focused on reflecting existing knowledge on cloud and DevOps principles and being keen to add more about your skills.

- It will deal with proficiency in designing architectures for cloud, automating deployment using **IaC** (Infrastructure as Code) tools and implementing CI/CD, and containerization with **Docker** and **Kubernetes**.

- Such internships become very helpful in the expert building process in cloud computing, DevOps methodologies, and industry practices in those roles for technology, e-commerce, healthcare, and the like industries where Cloud and DevOps play a pivot role.

- By getting hands-on experience, participants enhance their professional profiles by equipping themselves with the skills and knowledge necessary to excel in the cloud engineering and DevOps domains.

INDEX

CHAPTER 1 **PAGE : 1**

- EXECUTIVE SUMMARY

CHAPTER 2 **PAGE : 2**

- OVERVIEW OF THE ORGANIZATION

CHAPTER 3: **PAGE : 3-15**

- INTERNSHIP PART **PAGE : 3**
- ACTIVITY LOG FOR WEEK1 **PAGE : 4**
- WEEKLY REPORT FOR WEEK 1 **PAGE : 5**
- ACTIVITY LOG FOR WEEK 2 **PAGE : 6**
- WEEKLY REPORT FOR WEEK 2 **PAGE : 7**
- ACTIVITY LOG FOR WEEK 3 **PAGE : 8**
- WEEKLY REPORT FOR WEEK 3 **PAGE : 9**
- ACTIVITY LOG FOR WEEK 4 **PAGE : 10**
- WEEKLY REPORT FOR WEEK 4 **PAGE : 11**
- ACTIVITY LOG FOR WEEK 5 **PAGE : 12**
- WEEKLY REPORT FOR WEEK 5 **PAGE : 13**
- ACTIVITY LOG FOR WEEK 6 **PAGE : 14**
- WEEKLY REPORT FOR WEEK 6 **PAGE : 15**

CHAPTER 4: **PAGE :16-25**

- OUTCOMES DESCRIPTION
- STUDENT SELF-EVALUATION OF THE SHORT-TERM INTERNSHIP

CHAPTER 1: EXECUTIVE SUMMARY

I have studied a broad set of tools, technologies, and methodologies in pursuit of mastering Cloud Engineering and DevOps and built a solid foundation in the management of cloud infrastructure as well as in DevOps practices. With the help of industry-standard tools such as Terraform, Jenkins, Docker, and Kubernetes, I have hands-on experience in deploying scalable architectures on the cloud, automating workflows, and managing containerized applications.

Engaging in such practical applications as provisioning of cloud resources, CI/CD pipeline implementation, and the optimization of system performance has enabled me to solve real-world challenges effectively. This journey equipped me with technical know-how, a collaborative mindset, and problem-solving skills-a perfect recipe for excelling in these rapidly evolving domains, namely, cloud computing and DevOps.

Learning Objectives:

- Develop a strong foundation in cloud computing principles, focusing on core concepts like scalability, fault tolerance, and high availability, essential for designing and managing resilient cloud infrastructures.
- Gain proficiency in using industry-standard tools such as Terraform, Docker, and Kubernetes for infrastructure automation, container orchestration, and streamlined application deployment.
- Understand and implement CI/CD pipelines using tools like Jenkins and GitHub Actions to automate and enhance software development and delivery processes.
- Learn techniques in cost optimization, security management, and compliance by configuring Identity and Access Management (IAM), role-based access control (RBAC), and implementing disaster recovery strategies.

Learning Outcomes:

- Design and Deploy Scalable Systems: Build efficient cloud infrastructures using platforms like AWS, Azure, and tools like Terraform, ensuring scalability, reliability, and cost optimization.
- Automate and Orchestrate Workflows: Develop CI/CD pipelines, containerize applications with Docker, and manage clusters using Kubernetes to streamline development and deployment processes.
- Monitor and Secure Cloud Environments: Use tools like Prometheus and Grafana for performance monitoring while implementing IAM, RBAC, and disaster recovery strategies to enhance security and resilience.

CHAPTER 2: OVERVIEW OF THE ORGANIZATION

DataValley Pvt. Limited is a forward-thinking organization committed to driving innovation and excellence in the field of data-driven technologies and solutions. With a mission to empower edge services and training programs that leverage the power of data to solve complex challenges and create value.

At DataValley, we combine deep expertise in analytics, artificial intelligence, and cloud computing to provide tailored solutions that meet the unique needs of our clients. Our dedicated team of data scientists, engineers, and industry experts work collaboratively to design and implement impactful strategies, enabling organizations to harness the full potential of their data assets.

DataValley's offerings include a comprehensive range of services, such as big data analytics, machine learning solutions, data engineering, and business intelligence. We also focus on upskilling professionals through advanced training programs in data science, AI, and emerging technologies, ensuring they stay ahead in today’s competitive and fast-paced digital landscape.

Beyond technical expertise, DataValley fosters a culture of collaboration and innovation, creating opportunities for knowledge sharing, research, and development. Our partnerships with leading technology companies and enterprises ensure that our solutions align with the latest industry standards and best practices.

As a trusted partner in the digital transformation journey, DataValley Pvt. Limited empowers clients and learners to unlock new opportunities, optimize processes, and achieve sustainable growth. With a strong commitment to quality, innovation, and excellence, DataValley is at the forefront of shaping the future of data-driven decision-making and technological progress.

CHAPTER 3: INTERNSHIP PART

During my 6-week Cloud Engineering and DevOps internship, the experience has been truly transformative, offering invaluable insights, hands-on exposure, and opportunities for personal and professional growth. As I reflect on this enriching journey, I am filled with gratitude for the challenges I faced, the knowledge I gained, and the skills I developed along the way.

From the very beginning, the internship was marked by a hands-on approach and a steep learning curve. I was entrusted with real-world projects that pushed me beyond my comfort zone, compelling me to apply theoretical concepts to practical scenarios. Tasks such as automating infrastructure using Terraform, building CI/CD pipelines with Jenkins, and containerizing applications using Docker provided me with a chance to bridge the gap between theory and practice while honing my technical skills.

A key takeaway from this internship was the critical role of collaboration and communication in a professional environment. Working closely with cross-functional teams, I learned the importance of exchanging ideas, offering constructive feedback, and aligning diverse perspectives to achieve project goals. This experience not only improved my teamwork and interpersonal skills but also helped me understand the value of diverse approaches to problem-solving.

Furthermore, the internship deepened my understanding of cloud technologies, DevOps methodologies, and industry practices. From managing cloud resources and configuring monitoring tools like Grafana to implementing robust security measures using IAM and RBAC, I gained a comprehensive view of the industry landscape and practical skills relevant to today's fast-evolving tech ecosystem.

Beyond technical competencies, the internship instilled a sense of accountability, adaptability, and resilience. Meeting deadlines, navigating obstacles, and embracing new challenges taught me the significance of perseverance and flexibility. These lessons have shaped my approach to tackling uncertainty and set the foundation for future professional endeavors.

In essence, my 6-week Cloud Engineering and DevOps internship was a pivotal experience that not only enhanced my technical expertise but also fostered personal growth. It has prepared me to navigate the complexities of the tech industry with confidence, determination, and a collaborative spirit.

ACTIVITY LOG FOR THE FIRST WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	Introduction to Course and Career Guidance in Cloud DevOps Role	Understanding career paths in Cloud DevOps	
Day – 2	Introduction to Cloud Computing: What is Cloud and Cloud Computing	Basic understanding of cloud computing concepts	
Day – 3	Introduction to Cloud Architecture: AWS vs Azure vs GCP	Comparison of cloud architecture among major providers	
Day – 4	Introduction to AWS: Overview and Service Walkthrough	Basic overview and walkthrough of AWS services	
Day – 5	AWS EC2 and Storage Lab	Hands-on lab: deploying EC2 instances and storage setup	

WEEKLY REPORT 1

WEEK–1 (From Dt 27/05/24 to Dt 31/05/24)

Objective of the Activity Done: The first week of the internship focused on the basics of cloud computing. We learned key concepts like the benefits of cloud computing and the differences between traditional and cloud-based systems. The main cloud service models—IaaS, PaaS, and SaaS—were introduced, along with examples from providers like AWS and Azure. This week provided a solid foundation for understanding how cloud technology supports modern IT infrastructure.

Detailed Report:

During the first week of the Cloud DevOps internship, students were introduced to the program's structure, focusing on key skills and technologies. The sessions emphasized hands-on learning, with practical experience in cloud technologies and DevOps practices, aiming to prepare students for real-world roles in cloud engineering and DevOps.

The week covered the significance of cloud computing, highlighting principles like scalability, cost efficiency, and resource provisioning. Students learned about cloud storage, compute resources, and virtualization, gaining an understanding of how cloud systems differ from traditional computing.

Students were also introduced to leading cloud providers—AWS, Azure, and Google Cloud Platform (GCP). The overview included services like AWS EC2, S3, and Lambda, helping students understand their practical applications and the role of cloud platforms in solving business challenges.

By the end of the week, students had a solid grasp of cloud computing fundamentals and the internship structure, setting the stage for deeper exploration into cloud engineering and DevOps practices in the upcoming weeks.

ACTIVITY LOG FOR THE SECOND WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	AWS Networking Part I: Basics and VPC Setup	Understanding AWS networking basics and VPC creation	
Day – 2	AWS Networking Part II: VPN, Direct Connect, Gateway	Learning about VPN, Direct Connect, and AWS Gateway services	
Day – 3	AWS IAM: Identity & Access Management	Managing user access and permissions in AWS	
Day – 4	AWS IAM Lab: Hands-on IAM Setup	Practical setup and configuration of IAM in AWS	
Day – 5	Introduction to AWS Database Services: RDS, DynamoDB	Basic overview and use cases of AWS database services	

WEEKLY REPORT 2

WEEK–2 (From Dt 03/06/24 to Dt 07/06/24)

Objective of the Activity Done: The second week of the Cloud DevOps internship focused on providing a deeper understanding of AWS services. Students were introduced to the various service domains within AWS, such as compute, storage, networking, and databases. Detailed sessions covered essential AWS services like EC2 for compute resources, S3 for object storage, and RDS for relational databases, allowing students to understand their practical applications in cloud infrastructure.

Detailed Report:

This week, students explored AWS, beginning with an overview of its global infrastructure and signing up for the AWS free tier. Sessions covered AWS management tools like the AWS Management Console, CLI, and CloudFormation, which help streamline cloud operations.

The focus then shifted to AWS compute services, including EC2, Spot Instances, Auto Scaling Groups (ASG), and LightSail, to help students understand how to provision, manage, and scale compute resources. The week also covered container services and serverless computing with AWS Lambda and Fargate, emphasizing scalability and cost efficiency.

Students also learned about AWS storage services, comparing S3 (object storage) with EBS (block storage), and were introduced to S3 lifecycle policies and EBS volumes. Backup and restore processes were discussed, focusing on data protection and disaster recovery.

By the end of the week, students gained a strong understanding of AWS compute, container, and storage services, providing the foundation for more advanced cloud engineering and DevOps tasks in the upcoming weeks.

ACTIVITY LOG FOR THE THIRD WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	AWS Monitoring Tools: CloudWatch, Alarms, Metrics	Implementing monitoring and alarms using CloudWatch	
Day – 2	AWS Monitoring Lab: Cloudwatch Creation of Alarms and SNS	Practical setup of alarms and SNS integration in CloudWatch	
Day – 3	AWS Miscellaneous Services I: ElasticBeanstalk, SNS, SQS	Understanding and deploying AWS ElasticBeanstalk	
Day – 4	AWS Miscellaneous Services II: KMS, Secrets Manager	Managing keys and secrets in AWS	
Day – 5	AWS Miscellaneous Services III: Firewall Manager, WAF	Implementing security measures with AWS WAF and Firewall	

WEEKLY REPORT 3

WEEK– 3(From Dt 10/06/24 to Dt 14/06/24)

Objective of the Activity Done: The third week focused on the practical applications of AWS networking, VPCs (Virtual Private Clouds), and IAM (Identity and Access Management). Students learned how to set up and configure VPCs to create secure, isolated network environments. The week also covered how to manage user access and permissions using IAM, ensuring proper security protocols for different AWS services.

Detailed report:

This week, students explored AWS's global infrastructure and the AWS Free Tier, providing them with an understanding of AWS's scope and offering a hands-on opportunity to experiment with cloud services. They also learned about various AWS management tools, including the AWS Management Console, CLI, and CloudFormation, which streamline cloud operations and automate infrastructure deployment.

The focus then shifted to AWS compute services, where students learned to manage and scale compute resources through EC2 instances, Spot Instances, Auto Scaling Groups, and LightSail. These services are crucial for provisioning and efficiently scaling cloud resources. Additionally, students were introduced to container services and serverless computing with AWS Lambda and Fargate, allowing them to build scalable applications without managing servers.

Students also delved into AWS storage services, covering the differences between object storage (S3) and block storage (EBS). They learned to manage data using S3 lifecycle policies and EBS volumes for persistent storage. The importance of backup and restore processes for data protection and disaster recovery was emphasized.

By the end of the week, students had a solid foundation in AWS compute, container, and storage services. They are now equipped with the knowledge to implement scalable cloud solutions, preparing them for advanced cloud engineering and DevOps tasks in the future.

ACTIVITY LOG FOR THE FORTH WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	AWS Security Services: Inspector, GuardDuty, Security Hub	Understanding AWS security services and best practices	
Day – 2	AWS Payment Model: Reservations, Savings Plan, Recommendations	Managing costs and optimizing spending with AWS	
Day – 3	Introduction to AWS DevOps Part I: Concepts and Lifecycle	Understanding DevOps principles and agile methodologies	
Day – 3	Introduction to AWS DevOps Part II: Tools and Use Cases	Exploring DevOps tools and their practical applications	
Day – 4	Introduction to Version Control System: Git and GitHub	Basics of version control with Git and GitHub	
Day – 5	AWS Security Services: Inspector, GuardDuty, Security Hub	Understanding AWS security services and best practices	

WEEKLY REPORT 4

WEEK–4 (From Dt 17/06/24 to Dt 21/06/24)

Objective of the Activity Done: The fourth week focused on introducing students to AWS database services, monitoring tools, and other AWS offerings. Students learned about key database services such as Amazon RDS for relational databases and DynamoDB for NoSQL. The week also covered AWS monitoring tools like CloudWatch for resource tracking and performance monitoring. Additionally, students explored services like SNS for messaging and Lambda for serverless computing, gaining a broader understanding of AWS's diverse capabilities.

Detailed report:

This week, students learned about database concepts, comparing SQL and NoSQL databases and exploring AWS services like RDS, DynamoDB, Aurora, NeptuneDB, and Redshift for different use cases. They gained a broad understanding of AWS's database solutions, including relational, NoSQL, graph, and data warehousing databases.

The focus then shifted to AWS monitoring tools, particularly CloudWatch. Students learned how to monitor resources, track performance, and set alarms, using features like logs, metrics, and CloudWatch Insights to improve infrastructure reliability.

Additionally, students were introduced to AWS services like Elastic Beanstalk for application deployment, SNS and SQS for messaging, and KMS and Secrets Manager for encryption and managing sensitive data.

By the end of the week, students had a solid understanding of AWS's database, monitoring, and miscellaneous services, equipping them to build scalable, secure, and efficient cloud applications.

ACTIVITY LOG FOR THE FIFTH WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	Git Hands-On: Installation, Workflow, Commands	Practical experience with Git commands and workflow	
Day – 2	Introduction to Linux: Basics and Commands	Understanding Linux fundamentals and basic commands	
Day – 3	Linux Hands-On: Networking, File Systems, Process Management	Hands-on experience with Linux networking and processes	
Day – 4	AWS DevOps Part III: CI/CD Services, Automation Tools	Implementing CI/CD pipelines and automation in AWS	
Day – 5	AWS EKS Introduction and Setup	Introduction to AWS EKS and setting up Kubernetes clusters	

WEEKLY REPORT 5

WEEK–5 (From Dt 24/07/24 to Dt 28/07/24)

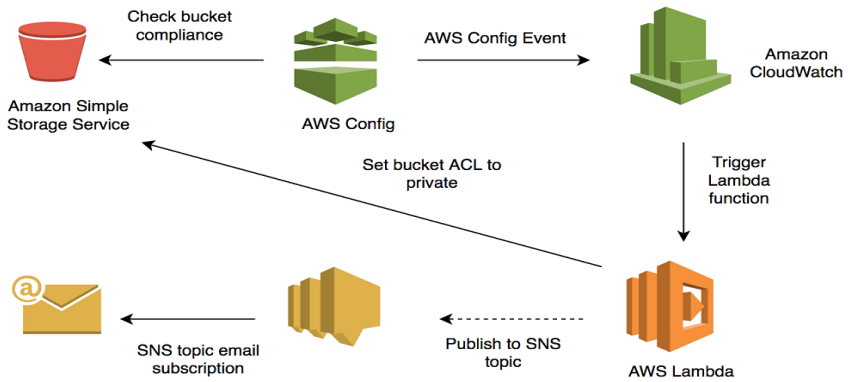
Objective of the Activity Done: The fifth week covered AWS security services, payment models, and an introduction to AWS DevOps. Students learned about security features like IAM for access control, AWS Shield for DDoS protection, and encryption methods to ensure secure cloud operations. The week also introduced AWS payment models, including pay-as-you-go and reserved instances, helping students understand cost management. Additionally, students were introduced to AWS DevOps tools like CodeCommit, CodeBuild, and CodePipeline, gaining insights into automating and streamlining deployment processes.

Detailed report:

This week, students learned about AWS security services, including AWS Inspector for automated security assessments, GuardDuty for threat detection, and CloudTrail for logging and monitoring API activity. They also explored Security Hub, Config, and Detective to gain deeper insights into security and compliance management across AWS environments.

The sessions on AWS payment models covered reservations, savings plans, and AWS cost management recommendations, teaching students how to optimize cloud expenses. Students gained a strong understanding of how to manage and reduce costs while utilizing AWS resources effectively.

The week concluded with an introduction to AWS DevOps, where students learned about DevOps principles, the DevOps lifecycle, and Agile methodologies. They were also introduced to essential DevOps tools, setting the stage for more hands-on DevOps practices in the upcoming weeks, emphasizing automation, continuous integration, and deployment.



ACTIVITY LOG FOR THE SIXTH WEEK

Day & Date	Brief description of the daily activity	Learning outcomes	Person InCharge Signature
Day – 1	AWS EKS Hands-On: Cluster Creation and Management	Practical experience with AWS EKS and Kubernetes	
Day – 2	Prometheus and Grafana Demo	Monitoring and visualization with Prometheus and Grafana	
Day – 3	AWS ECS: Introduction and Application Deployment	Deploying applications on AWS ECS	
Day – 4	CI/CD setup on S3 bucket Demo	Implementing CI/CD pipelines with S3 bucket deployments	
Day – 5	AWS EKS Setup using UI and CLI	Deploying websites using AWS EKS via UI and CLI	
Day – 6	Final Project: Deploying a Web Based Application on S3 using GitHub CI/CD process	Practical application of learned skills in a final project	

WEEKLY REPORT 6

WEEK–6 (From Dt 01/07/24 to Dt 06/07/24)

Objective of the Activity Done: The final week aimed to consolidate the students' knowledge and skills in AWS DevOps, focusing on advanced tools and hands-on projects, culminating in deploying a web-based application on S3 using GitHub CI/CD process.

Detailed report:

The week began with an in-depth, practical session on Amazon Elastic Kubernetes Service (EKS), where students learned to create and manage EKS clusters. This was followed by a demonstration of Prometheus and Grafana for monitoring and observability, where students set up Prometheus to collect metrics and used Grafana to visualize these metrics through detailed dashboards and alerts.

Subsequent sessions focused on AWS Elastic Container Service (ECS), introducing students to ECS concepts and teaching them how to deploy applications using ECS. A comprehensive hands-on session covered setting up CI/CD pipelines on an S3 bucket, utilizing both UI and CLI for AWS EKS setup, enhancing students' practical skills in managing cloud infrastructure and automating deployments.

The week concluded with the final project, where students deployed a web-based application on S3 using GitHub CI/CD process. This project integrated their learnings from the entire internship, allowing them to demonstrate their proficiency in setting up continuous integration and continuous deployment pipelines, managing cloud resources, and deploying applications efficiently on AWS.

By the end of the week, students had a solid grasp of advanced AWS DevOps tools and practices, well-prepared for real-world cloud and DevOps roles.

CHAPTER 4: OUTCOMES DESCRIPTION

Personal Growth and Self-Improvement

During my cloud engineering and DevOps internship, I gained a better understanding of my strengths and areas for growth. The hands-on tasks allowed me to develop resilience and adaptability when managing cloud resources and automating deployments. I also cultivated a problem-solving mindset, which helped me approach challenges in a structured and proactive manner, boosting my confidence in handling complex cloud technologies.

Professional Development and Skills Enhancement

I significantly enhanced my technical skills, working with tools like AWS, Docker, Jenkins, and Kubernetes. I gained practical experience in managing cloud resources, automating infrastructure, and implementing CI/CD pipelines. Furthermore, I improved my soft skills in team collaboration, communication, and time management, which are vital in any DevOps and cloud engineering role.

Technical Contributions and Achievements

Throughout the internship, I was involved in automating cloud infrastructure using Terraform, creating CI/CD pipelines, and optimizing cloud resource usage. I helped streamline processes by working on containerization projects with Docker and Kubernetes, improving deployment times and system scalability. My contributions directly impacted the efficiency and performance of the cloud operations within the organization.

Networking and Future Opportunities

This internship provided me with the opportunity to build a strong professional network by connecting with mentors and industry professionals. The relationships formed and the knowledge shared have opened potential avenues for career growth in cloud engineering and DevOps. These connections will be valuable as I progress in my career, offering guidance and potential collaboration opportunities in the future.

Summary of Internship Outcomes

In conclusion, my cloud engineering and DevOps internship was an enriching experience that helped me develop both technical and soft skills. The practical exposure to cloud infrastructure management, automation, and DevOps practices has set a strong foundation for my career. This experience has equipped me with the tools, knowledge, and confidence to pursue future opportunities in the dynamic field of cloud and DevOps.

Real-Time Technical Skills Acquired During the Internship

Cloud Infrastructure Management
During my internship, I worked with AWS to manage cloud infrastructure, configuring EC2 instances and S3 buckets. I also used AWS CLI and CloudFormation to automate cloud operations, improving efficiency in resource provisioning and management.

Containerization and Orchestration
I gained experience using Docker to containerize applications and Kubernetes for orchestration. I learned how to deploy and manage applications in a scalable environment, understanding the advantages of containerization for cloud-based deployments.

Continuous Integration and Continuous Deployment (CI/CD)
I contributed to creating CI/CD pipelines using Jenkins and AWS CodePipeline, automating the build, test, and deployment process. This experience taught me the value of automating repetitive tasks to enhance development speed and reliability.

Infrastructure as Code (IaC)
I worked with Terraform and AWS CloudFormation to manage cloud infrastructure as code. This allowed me to automate deployments, ensuring scalability and repeatability while embracing DevOps principles like version control and automation.

Monitoring and Logging
I used AWS CloudWatch and Grafana to monitor resources and applications. Setting up alerts for performance issues and utilizing centralized logging with tools like the ELK stack helped me optimize cloud resource management and performance.

Security and Cost Management
I learned AWS security best practices, including IAM roles and encryption. I also worked on cost optimization, using AWS cost management tools to monitor usage and control spending while ensuring efficient resource allocation.

Managerial Skills Acquired During Internship

Project Management and Task Organization
During my internship, I utilized project management techniques such as setting clear objectives, establishing timelines, and prioritizing tasks. These strategies helped me manage workloads effectively, ensuring that I met deadlines and contributed to the successful completion of cloud engineering and DevOps projects.

Team Collaboration and Leadership
I worked closely with cross-functional teams, offering suggestions and helping delegate tasks. I developed leadership skills by motivating team members, ensuring clear communication, and fostering a collaborative atmosphere, all of which were essential for achieving shared cloud and DevOps goals.

Improving Communication Skills
Communication was key throughout my internship. I focused on enhancing both written and verbal communication, producing clear and concise reports, and sharing findings related to cloud resource management and DevOps processes. Additionally, I practiced active listening, which allowed me to better understand team discussions and contribute effectively to problem-solving.discussions helped me collaborate better and contribute to problem-solving efforts.

Improving Abilities in Team Dynamics and Leadership

I enhanced my ability to work effectively within teams by:

- Actively participating in team meetings and sharing insights.
- Encouraging transparency and communication to align tasks and deadlines.
- Taking the initiative to lead small tasks, ensuring clear goals and a positive team dynamic.

Technological Developments Observed During Internship

Advancements in Cloud Automation

During my internship, I observed the growing trend of automation in cloud management, particularly with Infrastructure as Code (IaC) tools like Terraform and CloudFormation. These tools help streamline cloud infrastructure deployment, ensuring consistency and reducing the risk of human error while enabling faster, more scalable operations.

Containerization and Orchestration

The rise of container technologies like Docker and Kubernetes was evident throughout my internship. These tools are revolutionizing how applications are deployed and managed in the cloud, offering improved scalability, portability, and ease of management, which is essential for cloud-native DevOps practices.

DevOps Toolchain Advancements

I noticed significant advancements in the DevOps toolchain, particularly around Continuous Integration/Continuous Deployment (CI/CD) pipelines. Tools such as Jenkins, AWS CodePipeline, and GitLab have become more integrated and automated, facilitating faster software delivery while maintaining high-quality standards through automated testing and deployment.

Cloud Security and Threat Protection

As organizations increasingly migrate to the cloud, I observed a heightened focus on cloud security solutions. Cloud platforms like AWS and Google Cloud are embedding advanced security features, including automated vulnerability scanning, enhanced DDoS protection, and AI-powered threat detection, to safeguard cloud environments against evolving threats.

Student Self Evaluation of the Short-Term Internship

Student Name: Meduri S S V L Aiswarya

Registration No: 216K1A0571

From: **To :**

Date of Evaluation:

Organization Name & Address: DataValley India Pvt Ltd.

Please rate your performance in the following areas:

Rating Scale: **Lefler grade of CGPA calculation to be provided**

1	Oral communication	1	2	3	4	5
2	Written communication	1	2	3	4	5
3	Proactiveness	1	2	3	4	5
4	Interaction ability with community	1	2	3	4	5
5	Positive Attitude	1	2	3	4	5
6	Self-confidence	1	2	3	4	5
7	Ability to learn	1	2	3	4	5
8	Work Plan and Action	1	2	3	4	5
9	Professionalism	1	2	3	4	5
10	Creativity	1	2	3	4	5
11	Quality of work done	1	2	3	4	5
12	Time Management	1	2	3	4	5
13	Understanding about community	1	2	3	4	5
14	Achieving outcomes	1	2	3	4	5
15	**OVERALL SCORE**	**1**	**2**	**3**	**4**	**5**

Date: **Signature of the Student**

Evaluation by the Supervisor of the Intern Organization

Student Name: Meduri S S V L Aiswarya

Registration No: 216K1A0571

From: **To :**

Date of Evaluation:

Organization Name & Address: DataValley India Pvt Ltd.

Name & Address of the Supervisor with Mobile Number:

Please rate your performance in the following areas:

Rating Scale: **Lefler grade of CGPA calculation to be provided**

1	Oral communication	1	2	3	4	5
2	Written communication	1	2	3	4	5
3	Proactiveness	1	2	3	4	5
4	Interaction ability with community	1	2	3	4	5
5	Positive Attitude	1	2	3	4	5
6	Self-confidence	1	2	3	4	5
7	Ability to learn	1	2	3	4	5
8	Work Plan and Action	1	2	3	4	5
9	Professionalism	1	2	3	4	5
10	Creativity	1	2	3	4	5
11	Quality of work done	1	2	3	4	5
12	Time Management	1	2	3	4	5
13	Understanding about community	1	2	3	4	5
14	Achieving outcomes	1	2	3	4	5
15	**OVERALL SCORE**	**1**	**2**	**3**	**4**	**5**

Date: **Signature of the Supervisor**

EVALUATION

Internal Evaluation for Short Term Internship (On-site/Virtual)

Objectives:

- To integrate theory and practice.
- To learn to appreciate work and its function towards the future.
- To develop work habits and attitudes necessary for job success.
- To develop communication, interpersonal and other critical skills in the future job.
- To acquire additional skills required for the world of work.

Assessment Model:

- There shall only be internal evaluation.
- The Faculty Guide assigned is in-charge of the learning activities of the students and for the comprehensive and continuous assessment of the students.
- The assessment is to be conducted for 100 marks.
- The number of credits assigned is 4. Later the marks shall be converted into grades and grade points to include finally in the SGPA and CGPA.
- The weightings shall be:
    - Activity Log 25 marks
    - Internship Evaluation 50marks
    - Oral Presentation 25 marks

- Activity Log is the record of the day-to-day activities. The Activity Log is assessed on an individual basis, thus allowing for individual members within groups to be assessed this way. The assessment will take into consideration the individual student's involvement in the assigned work.
- While evaluating the student's Activity Log, the following shall be considered –
    a. The individual student's effort and commitment.
    b. The originality and quality of the work produced by the individual student.
    c. The student's integration and co-operation with the work assigned.
    d. The completeness of the Activity Log.

- The Internship Evaluation shall include the following components and based on Weekly Reports and Outcomes Description

    a. Description of the Work Environment.

    b. Real Time Technical Skills acquired.

    c. Managerial Skills acquired.

    d. Improvement of Communication Skills.

    e. Team Dynamics

    f. Technological Developments recorded.

MARKS STATEMENT

INTERNAL ASSESSMENT STATEMENT

Name of The Student:

Programme of the Study:

Year of the Study:

Group:

Registered no:

Name of the College:

University:

S.No	***Evaluation Criterion***	***Maximum Marks***	***Marks Awarded***
1.	Activity Log	25	
2.	Internship Evaluation	50	
3.	Oral Presentation	25	
	GRAND TOTAL	100	

Date:

Signature of the Faculty Guide

Certified by

Signature of the Head of the Department/Principal

REFERENCES

This section provides candidates with a foundational understanding of cloud engineering and DevOps concepts and tools, as outlined in the DataValley India Pvt Limited Cloud Engineering & DevOps course. While not mandatory, it is highly recommended that candidates review the modules mentioned in the course. This will ensure familiarity with essential cloud platforms, DevOps tools, and best practices, laying a solid foundation for the practical application of concepts in real-world scenarios.

- **DataValley Login : https://datavalley.ai/**