**ATLANTIC TECHNOLOGICAL UNIVERSITY:ATU**

**ASSIGNMENT COVER SHEET**

**ASSIGNMENT COVER SHEET**

Lecturer’s Name: **Ruth** Assessment Title: **Use of Source Code Management Tool** Work to be submitted to: **Maria Griffin** Date for submission of work: **23/10/2022** Place and time for submitting work: **Blackboard via Turnitin by PDF Document**

**Notes**

**Penalties:** The total marks available for an assessment is reduced by 15% for work submitted up to one week late. The total marks available are reduced by 30% for work up to two weeks late. Assessment work received more than two weeks late will receive a mark of zero. [Incidents of alleged plagiarism and cheating are dealt with in accordance with the Institute’s Assessment Regulations.]

**Plagiarism:** Presenting the ideas etc. of someone else without proper acknowledgement (see section L1 paragraph 8).

**Cheating:** The use of unauthorised material in a test, exam etc., unauthorised access to test matter, unauthorised collusion, dishonest behaviour in respect of assessments, and deliberate plagiarism (see section L1 paragraph 8).

**Continuous Assessment:** For students repeating an examination, marks awarded for continuous assessment, shall normally be carried forward from the original examination to the repeat examination.

**\**

**To be completed by the student**

Student’s Name: **Vijay Kumar Rajendran** Class: **MSc. in DevOps** Subject Module: **DevOps Software Engineering**

Word Count (where applicable): **2176** I confirm that the work submitted has been produced solely through my own efforts.

Student’s signature: **Vijay Kumar Rajendran** Date: **12/11/2022**

The following tables describes the significance of various abbreviations and acronyms used throughout the thesis. The page on which each one is defined or first used is also given. Nonstandard acronyms that are used in some places to abbreviate the names of certain white matter structures are not in this list

|  |
| --- |
| Abbreviation Meaning Page |

IaC Infrastructure As A Code

NAT Network Address Translation

VPC Virtual Private Cloud

EC2 Elastic Cloud Compute

SG Security Group

ALB Application Load Balancer

AZ Availability Zone

CNAME Canonical Name

# Conclusion

The main purpose of this lab is to learn how to create reusable infrastructure and demonstrate infrastructure as a code using AWS’s built-in tool called Cloud Formation. Infrastructure As A Code (IaC) is a fundamental pillar in devops practises that enables organisations to rapidly deliver software and services to end users by automating system dependencies and provisioning local and remote instances. IaC is a fundamental practise for implementing continuous deployment.

Our main goal for this lab is to build an infrastructure that hosts a blogging site using Nginx as a webserver, Mysql as a database, and Wordpress as an application server. We also want to focus on security, high availability, fault tolerance, and scalability. The cloud formation code must be designed in such a way that it can be used in any AWS cloud environment with minimal effort on the part of the cloud engineer.

I'm creating the VPC infrastructure with nested stacks called vpc.yml, which is very convenient because the main template will not be changed; only the parameter and master stack files can be changed for future changes or upgrades in the current environment. The VPC contains 6 AZ’s where the instances will be distributed across for high availability & scalability with minimal/zero downtime. The VPC has 6 AZs, each of which has 2 Public Subnets, 2 Private Subnets, and 2 Database Subnets, as we

The VPC contains 1 Internet Gateway, 1 Nat Gateway, 1 jumphost Security group & 6 AZ’s which contains 2 Public Subnet, 2 private subnet & 2 Database subnet (private subnet). Keeping security in mind we have created a bastion/jump host in public AZ which is a dedicated server that allows authorised users to connect to a private server which are located in private subnet from a public network. So that no production server is exposed publicly. I have also created NAT gateway in public subnet which is responsible to provide internet access to the all the private server. So that no server is exposed publicly in any way. I have created another CloudFormation template called ec2-alb.yml. This is used to create an ec2 instance in private subnet which installs nginx webserver using our user data script. Along with this Public Application load balancer is created in public AZ which is exposed publicly on port 80. Our webserver is placed behind the ALB where port 80 is mapped for ALB and 22 is mapped for jumphost SG. We can use the ALB’s DNS name to map with our domain name by creating a CNAME record.

The infrastructure code can be used in any AWS environment by just adding few parameters which I have instructed in the Readme file.

The cloudformation files has to be uploaded in the S3 buckets