A red and white logo

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**Final Project: Two-Tier web application automation with Terraform, Ansible and GitHub Actions**

**Name:** ARMAN LAMBA

**Course:** Cloud Automation and control Systems

**Section:** ACS730

**Student number:** 122820152

**Email id:** [**aalamba@myseneca.ca**](mailto:aalamba@myseneca.ca)

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**Professor: Dhana Karuppusamy**

**Final project recording link:**

[acs\_finalproject\_aalamba.webm](https://seneca-my.sharepoint.com/:v:/g/personal/aalamba_myseneca_ca/EQiFpx6K4ctIsTfuJ72aezoB7g3SmDYv3XAT9aioi5j7cw?nav=eyJyZWZlcnJhbEluZm8iOnsicmVmZXJyYWxBcHAiOiJTdHJlYW1XZWJBcHAiLCJyZWZlcnJhbFZpZXciOiJTaGFyZURpYWxvZy1MaW5rIiwicmVmZXJyYWxBcHBQbGF0Zm9ybSI6IldlYiIsInJlZmVycmFsTW9kZSI6InZpZXcifX0%3D&e=AEZU9z)

A screenshot of a video game

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**1. Explanation of the Traffic Flows**

1. **Red Flow**

* **How is this flow triggered?**  
  The red flow is triggered when an external user sends an HTTP request to the web server through the public IP of the load balancer.
* **Who are the users in this flow?**  
  The users in this flow are external clients accessing the web server to view the content hosted on the website.
* **What kind of traffic is it?**  
  This flow represents web traffic, as it involves the exchange of HTTP requests and responses between the client and the web server through the load balancer.

1. **Blue Flow**

* **How is this flow triggered?**  
  The blue flow is triggered by internal processes or administrators needing to perform maintenance or updates on the web server or related infrastructure.
* **Who are the users in this flow?**  
  The users in this flow are internal administrators or system processes interacting with the server.
* **What kind of traffic is it?**  
  This flow is primarily systems administration traffic, including SSH connections for managing the server.

**2. Webserver Image Load from stock images**

The webserver is configured to load an image directly from a website of stock images

**3. Challenges and Solutions**

During the project implementation, several challenges were encountered:

1. **Terraform Code Deployment Issues:**  
   The load balancer was not connecting properly to the web servers, which disrupted traffic flow. Debugging efforts revealed a configuration mismatch in the Terraform code. By carefully reviewing and updating the Terraform scripts, the issue was resolved, and the load balancer successfully routed traffic to the web servers.
2. **Ansible Configuration File Keypair Issues:**  
   Initially, the Ansible configuration file did not recognize the keypair created for SSH connections. This prevented successful deployment via Ansible. The issue was resolved by correcting the path to the keypair in the ansible.cfg file and updating the relevant playbooks to match the corrected path. This allowed for seamless deployment and configuration.

**Conclusion**

This project provided valuable learning opportunities, particularly in debugging infrastructure-as-code deployments with Terraform and configuring Ansible for automated deployments. The key lessons learned include the importance of precise configuration management and the value of thorough debugging processes. These experiences will inform future projects, especially those involving complex multi-tier deployments in cloud environments.