**ASSESSMENT 1:**

**Docker**

**COMP3004**

**Advanced Computing and  
Networking Infrastructures**

**2022/2023**

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# Introduction

200 words. Discuss: (about the tasks assigned, background information on Docker, Nginx, load balancing, and automation)

Introduction, Presentation, and Structure (20%): are the introduction and background information described appropriately? Is the report well-presented and structured? Are the references sufficient and properly cited in the report?

Graphical user interface, text, application

Description automatically generated

**Project Intent**

What is the purpose of the project? What will the project do? What is it for? Why is it necessary?

* Provided problem: media service provider is **growing fast** and **web server is not able to cope**.
* Task: Research and experiment with the possibility of using LOAD BALANCING to balance web traffic.
* Approach: Docker, Ubuntu Linux server > use docker containers as a software load balancer.
* Benefit: Automation methods can be applied to configurations, dockerfile images, shell scripts for initial system setup/install.

As the Internet expands…

Azure’s Network Security Team (2023) reported that during 2022, they mitigated a total of 520,000 unique denial-of-service attacks.

Within the year 2022, out of the 573 UK-based businesses, 10% identified occurrences of denial-of-service attacks.

**Docker**

Use of docker within project? What is it?

**Nginx**

Use of Nginx within project? What is it?

**Load Balancing**

Use of load balancing within project? What is it?

**Automation**

Use of load balancing within project? What is it?

# Experiment and Setup

375 words. Discuss: (a systematic diagram and descriptions about the system designed, system setup steps to install relevant packages/dependencies (in shell scripts, e.g. install.sh), and some

explanations)

# Automation Process

450 words. Discuss: (your written Dockerfiles, Docker Compose file, plus descriptions/explanations)

# Results and Discussion

375 words. Discuss: (evidence to show that the system works as you have designed/configured. This should include screenshots, plus descriptions/explanations, on e.g., load balancing and automation. Discussions should also cover what limitations are for the approaches taken)

# Conclusions

100 words. Conclusions here

# References

Word count not included. Harvard style

<https://primo.plymouth.ac.uk/primo-explore/search?query=sub,exact,Botnets%20,AND&tab=local&search_scope=44PLY_ALL%2BPC&vid=VU_PLY&lang=en_US&mode=advanced&offset=0>

<https://www.gov.uk/government/statistics/cyber-security-breaches-survey-2022/cyber-security-breaches-survey-2022#chapter-5-incidence-and-impact-of-breaches-or-attacks>

<https://dl-acm-org.plymouth.idm.oclc.org/doi/pdf/10.1145/3351556.3351560>

<https://www.microsoft.com/en-us/security/blog/2023/02/21/2022-in-review-ddos-attack-trends-and-insights/>