

Cloud Management System



Course: Cloud Computing and Networking

Project Submission: 24th December 2023

Dear Students,

Welcome to the project component of Cloud Computing and Networking. In this project, you will be developing a Cloud Management System using QEMU and Docker. The system will allow users to perform various operations on virtual machines (VMs) and Docker based on their input. The project aims to enhance your understanding of virtualization technologies and cloud management.

Project Objectives:

The primary objectives of this project is to implement to following features:

1. Create a Virtual Machine:

Implement a feature that enables users to create VMs based on their input parameters. The system should provide options for specifying VM configuration details such as memory, and disk. The user input can be a) interactive user input and b) configuration file.

2. Create Docker File:

Implement a feature that enables the users to create dockerfile for their docker images. The program has to ask about the path to save the dockerfile and the contents of the Dockerfile.

3) Build Docker Image

Implement a feature that enable the users to create docker image. The program must ask the user about the dockerfile to use and image name/tag.

3) List Docker Images:

Implement a feature that allow the users to list all the docker images on the system.

4) List all the running containers

Implement a feature to let the users list all the running containers.

5) Stop a container

Implement a feature to all the users to stop specific container.

6) Search Image

Implement a feature that allows the users to search for a docker image. The program must ask the user to input the image name then display the results.

7) Search for image on DockerHub

Implement a feature to allow the users to search for image on DockerHub. The program has to ask for the image name to search for.

8) Download/Pull image

Implement a feature to allow the users to download a docker image from DockerHub

9) Validation:

The program must check for correct input (validate the input) and generate error before taking the action (e.g., if the file path is not valid path, then alert the user before taking the action, and do not take the action till the user enters a valid path, etc.).

Project Deliverables:

To successfully complete this project, you are expected to submit the following:

1. Source Code:

Provide well-documented source code for the Cloud Management System. It should demonstrate your understanding of the concepts covered in the course and adhere to good software engineering practices.

2. User Manual:

Prepare a user manual that provides clear instructions on how to use the system. The manual should include explanations of each feature and guidelines for correct usage.

3. Project and Testing Report:

Submit a comprehensive project report that describes the design, challenges faced, and solutions implemented during the development process. Include any testing methodologies employed and an evaluation of the system's performance (including test cases and evidences).

4. Submit a 10 minutes video to present the features of the program that you implemented. This must be *uploaded 2 days* before the submission time.

Project Guidelines:

1. Use QEMU and Docker for virtualization purposes.
2. Choose a programming language suitable for the project requirements.
3. The project should have a user-friendly user interface.
4. Follow best practices for code organization, documentation, and version control.
5. Test your system thoroughly to ensure functionality, stability, and error handling.
6. Seek clarification and guidance from the course instructor and teaching assistants as needed.

Grades Distribution:

Implementing Requirements	User Manual	Project and Testing Report	GUI	Validation
8	2	4	3	3

I believe that successfully completing this project will enhance your skills and knowledge in virtualization technologies. It will provide you with a practical understanding of implementing VM-related operations using QEMU and handling different tasks in Docker.

If you have any questions or need further clarification, please feel free to reach out to me or teaching assistants. Good luck with your project, and we look forward to seeing your innovative solutions!

Best regards,
Dr. Mohamed ElGazzar