MSA Cloud Management System

Course: Cloud Computing
Project Submission: TBD

Dear Students,

Welcome to the project component of Cloud Computing Project. 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 system management.

Project Objectives:
The primary objectives of this project are as follows:

1. Create Virtual Disk:
   Implement a feature that enables the user to create a virtual disk by specifying its type, size, and format.

2. Create a Virtual Machine:
   a) Implement a feature that enables users to create a VM based on their input parameters. The system should provide options for specifying VM configuration details such as CPU, memory, and disk. The user input can be - at least – using interactive user input
   b) The user can use any of the virtual disks created in requirement # 1 (select one of created virtual disks)

3. Create Docker File:
   Implement a feature that enables to 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.

4. 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.

5. List Docker Images:
   Implement a feature to list all the docker images on the system.

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

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

8. 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/tag then display the results.

9. 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.

10. Download/Pull image

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

Project Deliverables:

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

1. Source Code:

Provide well-documented source code for the Virtual Machine Management System. It should demonstrate your understanding of the concepts covered in the course and adhere to good software engineering practices. (Use Github to manage the code)

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 choices, 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).

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.

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