

INSTITUTE OF COMPUTER TECHNOLOGY
B-TECH COMPUTER SCIENCE ENGINEERING 2025-26
SUBJECT: IDENTITY ACCESS MANAGEMENT

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BRANCH: CYBER SECURITY

BATCH: 52

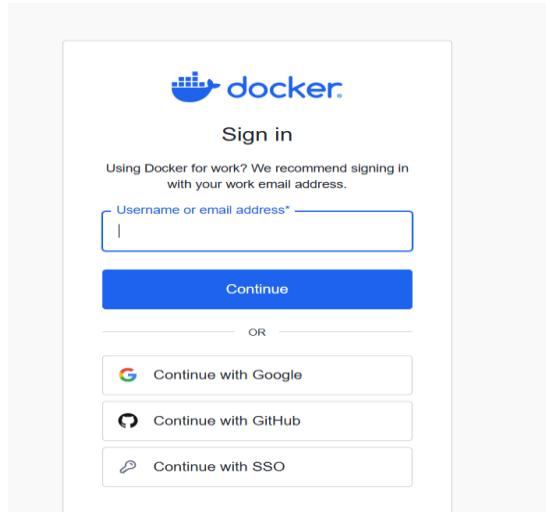
Lab 1: Installing Docker and Keycloak

STEP_1:

→ INSTALL DOCKER DESKTOP

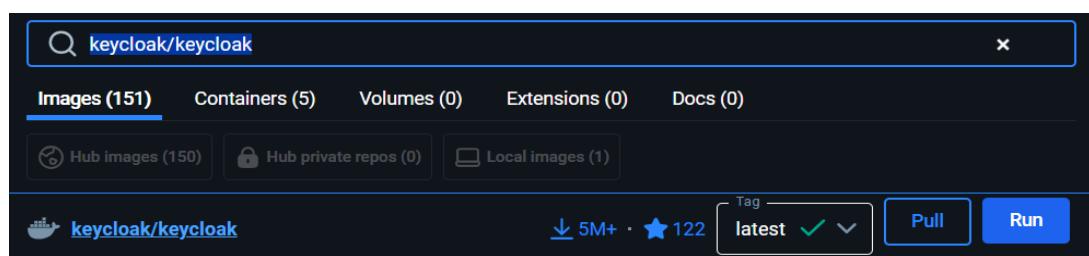
STEP_2

→ SIGNING UP DOCKER ACCOUNT



STEP_3:

→ PULLING KEYCLOAK IMAGE FROM DOCKER



STEP_4:

→ RUN KEYCLOAK

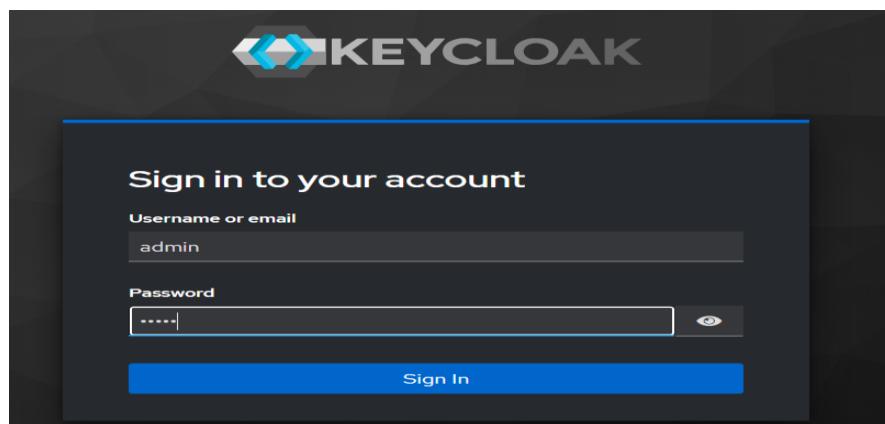
- >>>docker pull keycloak/keycloak
- >>>docker run -p 8080:8080 -e KEYCLOAK_ADMIN=admin -e KEYCLOAK_ADMIN_PASSWORD=admin keycloak/keycloak start-dev
- NOTE:RUN ON CMD

```
PS C:\Users\Hp> docker run -p 8080:8080 -e KEYCLOAK_ADMIN=admin -e KEYCLOAK_ADMIN_PASSWORD=admin keycloak/k
eycloak start-dev
Updating the configuration and installing your custom providers, if any. Please wait.
2025-07-25 03:25:47,822 INFO [io.quarkus.deployment.QuarkusAugmentor] (main) Quarkus augmentation complete
d in 11317ms
Running the server in development mode. DO NOT use this configuration in production.
2025-07-25 03:25:56,922 INFO [org.keycloak.quarkus.runtime.storage.database.liquibase.QuarksJpaUpdaterPro
vider] (main) Initializing database schema. Using changelog META-INF/jpa-changelog-master.xml
2025-07-25 03:26:03,920 INFO [org.keycloak.spi.infinispan.impl.embedded.JGroupsConfigurator] (main) JGroup
```

STEP_5:

→ Run <http://localhost:8080> on browser

→ Login by username=admin & password=admin



A screenshot of the Keycloak dashboard. The top navigation bar shows "KEYCLOAK" and a user profile for "admin". The left sidebar has a "Current realm" section with "master realm" selected, and a list of management options: Manage realms, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings, Authentication, and Identity providers. The main content area displays the "Welcome to Keycloak" message, which reads: "Keycloak provides user federation, strong authentication, user management, fine-grained authorization, and more. Add authentication to applications and secure services with minimum effort. No need to deal with storing users or authenticating users." Below this are links to "Refer to documentation", "View guides", "Join community", and "Read blog".

What is the difference between docker and Virtualization? Why do we use docker?

No.	Feature	Docker (Containerization)	Virtualization (VMs)
1	OS requirement	Shares host OS kernel	Each VM has its own full OS
2	Boot-up speed	Starts in seconds	Takes minutes to boot
3	Resource usage	Lightweight , uses less RAM and CPU	Heavy , consumes more RAM and CPU
4	Performance	Near-native performance	Slightly slower due to full OS layer
5	Size	Small container image size (MBs)	Large VM images (GBs)
6	Isolation level	Process-level isolation (less secure than VMs)	Full OS-level isolation (more secure)
7	Portability	Highly portable across systems	Less portable (OS dependencies)
8	Use case	Ideal for microservices , CI/CD, cloud apps	Ideal for running different OSes , full environments
9	Dependency handling	Bundles all app dependencies inside the container	Needs separate setup for each VM
10	Management	Easier to manage with tools like Docker Compose, Kubernetes	More complex to manage multiple VMs
11	Storage	Containers share layers, saving space	Each VM has its own full disk image
12	Security	Good, but shares kernel – some risks	Better isolation due to separate OS

- Docker is used to package applications with all their dependencies into lightweight, portable containers that run consistently across different environments. It makes development, testing, and deployment faster, more reliable, and easier to scale.