Experiment No. 6

Title: Application deployment using Kubernetes (PaaS)

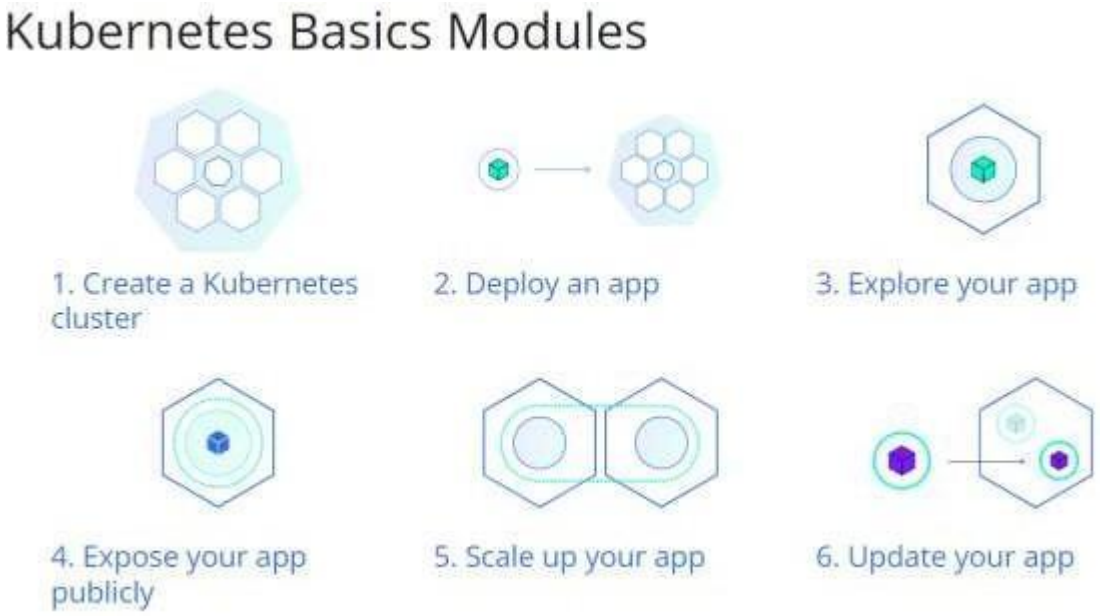
Batch: B–1 **Roll No: 16010422234** **Experiment No: 6**

Aim: Nodejs application deployment using Kubernetes (PaaS)

Resources needed: killercoda (online playground)

Theory:

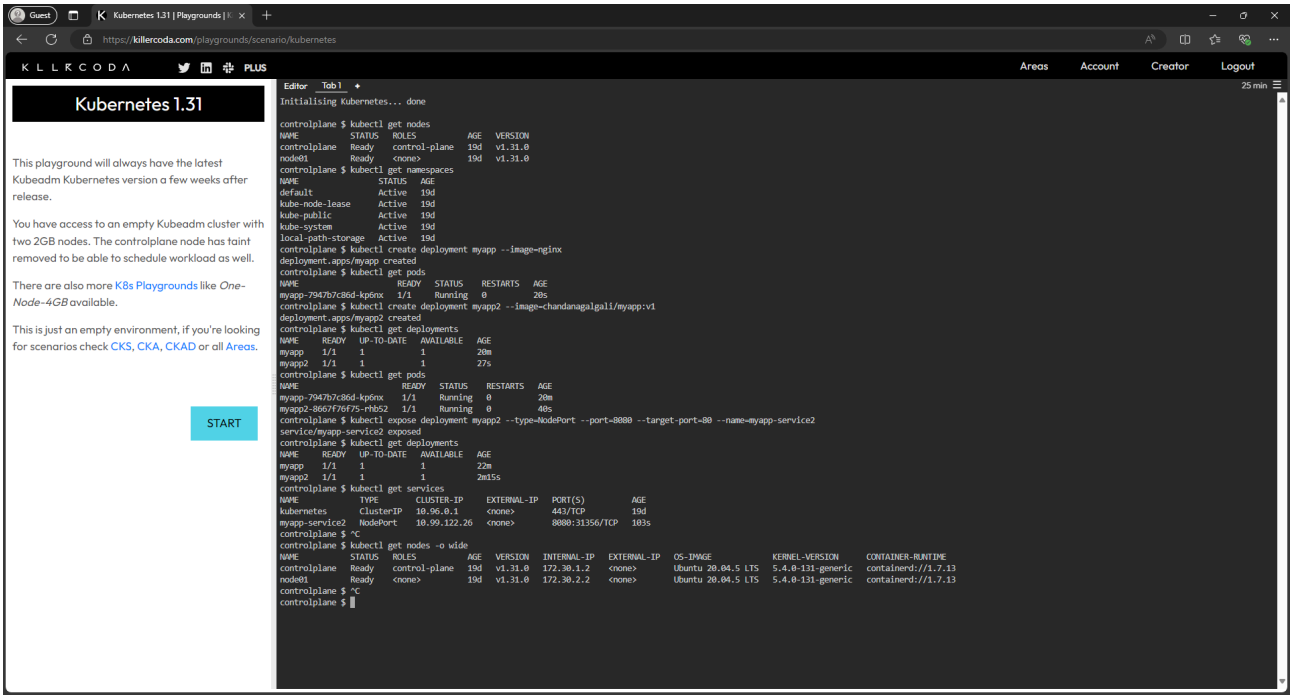
Kubernetes is a portable, extensible, open source platform for managing containerized workloads and services that facilitates both declarative configuration and automation. It has a large, rapidly growing ecosystem. Kubernetes services support and tools are widely available.

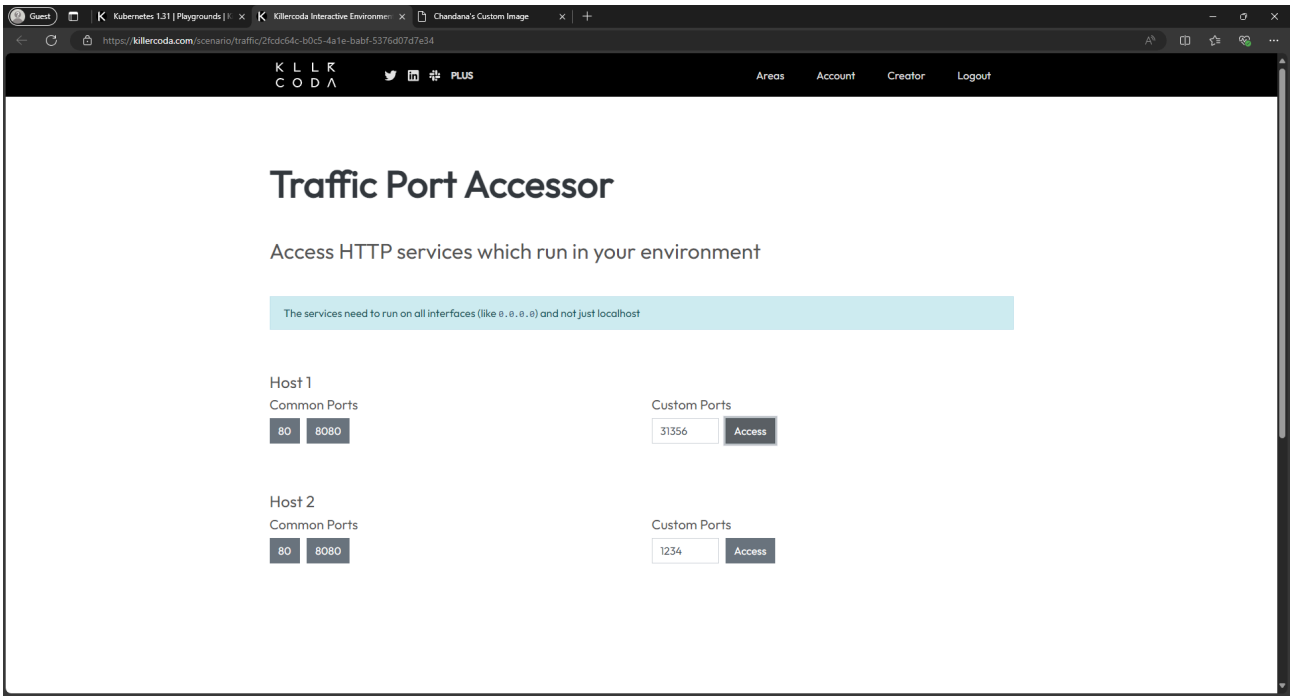


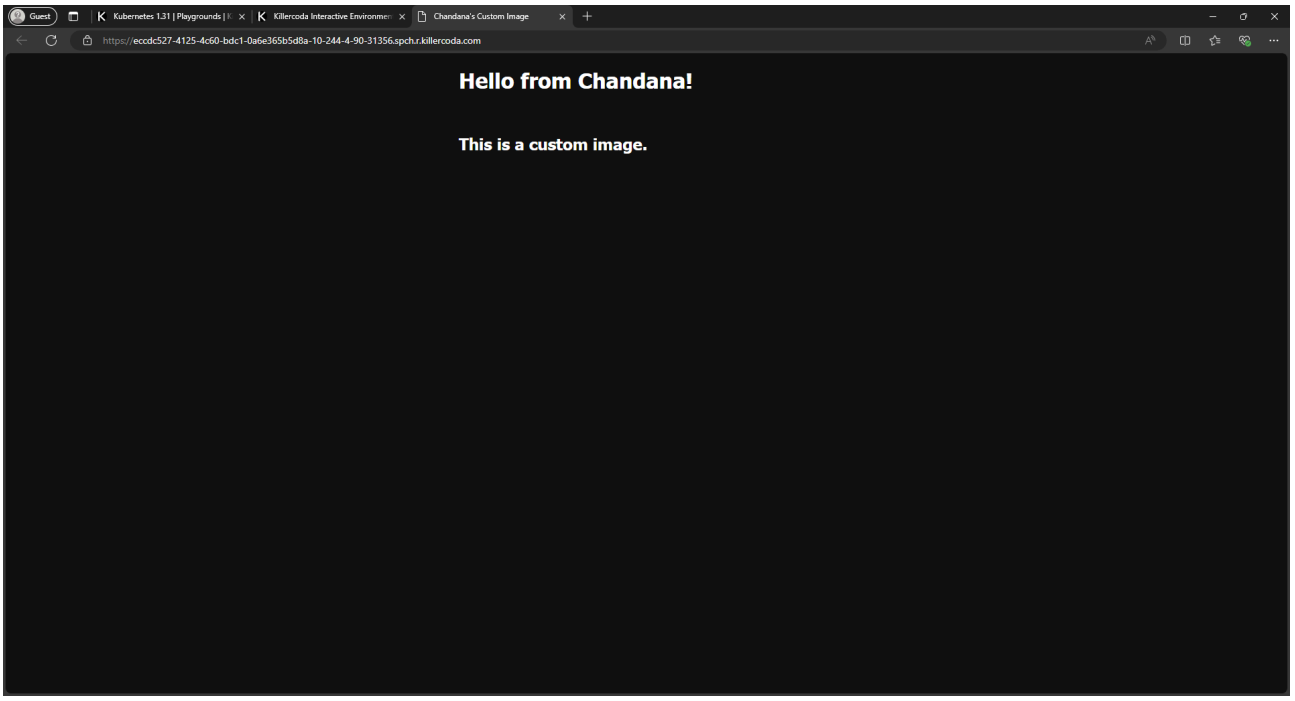
Procedure:

1) Explore all 1 to 4 modules.
2) 10 kubctl commands on killercoda (online playground).
3) Deploy an app on killercoda (online playground).
4) Explore and Expose an app (preferably image created in docker experiment).

Results: (Result of Steps with screenshots)







Questions:

Q1. Explain micro-services with an example.

Ans: Microservices, also known as the microservices architecture, is a design style where an application is built as a collection of small, autonomous services modeled around a specific business domain. Each service is independently deployable, scalable, and loosely coupled with others. This approach allows teams to develop, test, and deploy features faster and more effectively.

Example:

An e-commerce application can be divided into several microservices:

- User Service: Manages user registration, authentication, and profiles.
- Product Service: Handles product catalog, details, and inventory.
- Order Service: Manages cart operations, order placements, and payment processing.
- Shipping Service: Manages shipment tracking and delivery status.

These services communicate with each other via lightweight APIs (e.g., REST or gRPC) while remaining independent in functionality and deployment.

Outcomes: CO3 – Analyze different cloud architectures and IoT-cloud.

Conclusion: (Conclusion to be based on the objectives and outcomes achieved)

The experiment demonstrated the deployment and management of a Node.js application using Kubernetes on Killercoda, showcasing key features like container orchestration, declarative configuration, and service exposure, emphasizing Kubernetes as a powerful tool for modern PaaS solutions.

Grade: AA / AB / BB / BC / CC / CD / DD

Signature of faculty in-charge with date

References:

Websites:

1) https://kubernetes.io/docs/tutorials/kubernetes-basics/
2) https://killercoda.com/playgrounds/scenario/kubernetes
3) 5 steps to Deploy docker image to Kubernetes
4) https://www.youtube.com/watch?v=95zmJnz4iOo
