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Kubernetes Deployment Architecture for docker-ethereum Application

Introduction: -

The docker-Ethereum application, a straightforward decentralized application (dApp) that integrates Ganache, React, Node.js, and Ethereum technologies, seeks to establish a framework that guarantees high availability, scalability, and efficient resource utilization.

Key Components: -

Storage

Stateless Storage:

Adopting stateless storage ensures seamless replacement or rescheduling of pods without worrying about data loss or corruption. This aligns with the transient nature of containerized applications in the Kubernetes environment.

Scaling

Horizontal Scaling:

The architecture incorporates horizontal scaling to efficiently manage varying levels of traffic and workload demands. This automated approach optimizes resource utilization and enhances performance without manual intervention.

Load Balancing

HPA for React and dApp:

Load balancing is implemented to sustain application responsiveness and availability during periods of high traffic. By dynamically adjusting pod numbers, Kubernetes optimizes resource utilization, ensuring consistent performance levels.

User Management and Role Assignment:

Effective user management and role assignment are integral for enforcing security policies and limiting unauthorized access to sensitive Kubernetes resources. Role-Based Access Control (RBAC) ensures users only have access to resources essential for their tasks, bolstering overall security.

Conclusion:

The Kubernetes deployment architecture prioritizes scalability, reliability, and security for the docker-ethereum application. Leveraging stateless storage, horizontal scaling, and load balancing mechanisms ensures optimal performance and resource utilization. User management and role assignment further fortify security by implementing access control policies within the Kubernetes cluster. Overall, this architecture provides a robust foundation for deploying and managing the docker-ethereum application in a Kubernetes environment.