

Title: - Summary on Performance Evaluation of Distributed Systems in Multiple Clouds using Docker Swarm

The paper titled "Performance Evaluation of Distributed Systems in Multiple Clouds using Docker Swarm" by Nitin Naik discusses the design and evaluation of distributed systems in multiple clouds using Docker Swarm [1]. The author highlights the increasing popularity of distributed systems in multiple clouds due to their benefits, such as minimizing vendor lock-in and data loss [1]. However, designing such systems presents compatibility, interoperability, provisioning, and configuration management challenges across different cloud providers [1].

The paper introduces virtualization as the base technology of cloud-based distributed systems [1]. It mentions that virtual machines, although commonly used, require significant resources and can cause issues across multiple clouds [1]. The author proposes using Docker Swarm, a container-based clustering tool, to address these challenges. Docker Swarm resolves various issues associated with virtual machines and supports designing distributed systems in multiple clouds [1].

The paper presents a simulated development of a Docker Swarm-based distributed system that can be easily replicated in multiple clouds [1]. It discusses the attributes of the distributed system, including high availability, fault tolerance, automatic scalability, load balancing, maintainability of services, and scalability of large clusters [1]. Evaluating these attributes demonstrates the ease of designing and the natural behavior of the Docker Swarm-based distributed system [1].

The remaining sections of the paper delve into the details of containerization, Docker containers, and Docker Swarm [1]. Containerization is a technique that creates isolated environments similar to virtual machines but with fewer resources [1]. Docker containers, as instances of containerization, provide an easy and automated way to create, deploy, and execute applications [1]. On the other hand, Docker Swarm is introduced as a cluster management and orchestration tool that enables the formation of a virtual system by connecting and controlling multiple Docker nodes [1].

Personal critique and Analysis: -

One limitation of the paper is the need for empirical evidence from real-world implementations. Although the author presents a simulated development of a Docker Swarm-based distributed system, it would be beneficial to include real-world case studies or experiments to validate the effectiveness of the proposed approach. Additionally, the paper primarily focuses on the technical aspects of designing distributed systems using Docker Swarm. While this provides a solid foundation for understanding the technological capabilities and benefits, exploring the implications and considerations from a business or organizational perspective is also valuable. Cost, scalability, and operational feasibility are crucial in decision-making when implementing distributed systems in multiple clouds.

Furthermore, the paper could have delved deeper into the limitations and trade-offs associated with Docker Swarm. Every technology has its own set of constraints and potential drawbacks, and it would be insightful to discuss these aspects. Additionally, alternative approaches or technologies that address the challenges of distributed systems in multiple clouds could be explored, providing readers with a broader perspective.

In terms of future exploration, the paper opens opportunities for further research. For example, investigating the integration of other container orchestration platforms or exploring hybrid cloud

environments could expand the scope of the study. Additionally, analyzing the security implications and best practices for distributed systems in multiple clouds would be a valuable avenue for future exploration.

In conclusion, while the paper "Performance Evaluation of Distributed Systems in Multiple Clouds using Docker Swarm" presents valuable insights into designing distributed systems using Docker Swarm, there are some limitations and potential areas for future exploration. Real-world case studies, a broader perspective on implications, and exploring alternative technologies could enhance the understanding of distributed systems in multiple cloud environments.

References:

[1] N. Naik, "Performance Evaluation of Distributed Systems in Multiple Clouds using Docker Swarm," 2021 IEEE International Systems Conference (SysCon), Vancouver, BC, Canada, 2021, pp. 1-6, doi: 10.1109/SysCon48628.2021.9447123, <https://ieeexplore-ieee-org.ezproxy.library.dal.ca/document/9447123>