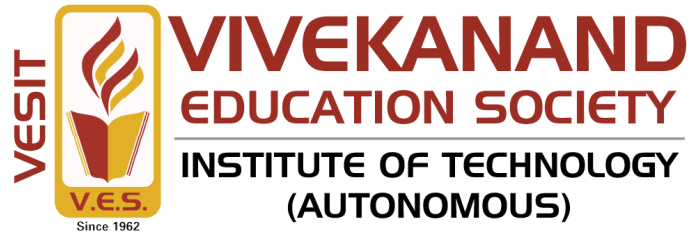


CONTINUOUS ASSESSMENT 2 REPORT



Subject : Operating System

Serverless Computing : A new Paradigm in Cloud and OS

Submitted by

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Serverless Computing: A New Paradigm in Cloud & OS

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Introduction

Serverless computing is a transformative cloud execution model that enables developers to build and deploy applications without managing infrastructure. It abstracts server management responsibilities, allowing the cloud provider to automatically handle provisioning, scaling, and execution. Serverless is inherently event-driven and operates on a pay-per-use model, offering scalability, cost efficiency, and simplified operations.

Key Features and Benefits

Unlike traditional computing models that rely on virtual machines or containers, serverless functions are stateless, lightweight, and triggered by specific events. Key advantages include automatic scaling, faster deployment cycles, high availability, and reduced operational costs. Developers can focus solely on application logic, improving overall productivity and efficiency.

Challenges and Security Considerations

Despite its many benefits, serverless computing presents certain limitations such as cold start latency, execution time constraints, and vendor lock-in. Security also requires attention due to multi-tenancy risks and potential vulnerabilities from insecure dependencies. Solutions like sandboxing (e.g., Firecracker, gVisor) and best practices such as least privilege access are essential.

Case Study and Future Trends

A notable example is Netflix, which uses AWS Lambda for processing vast volumes of streaming data in real-time, resulting in cost savings and improved performance. Looking ahead, trends like stateful serverless, cold start optimization, edge computing, and serverless AI point toward continued innovation. Serverless is poised to play a key role in the evolution of cloud-native architectures and operating systems.