IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.471 ⁙ Peer-reviewed & Refereed journal ⁙ Vol. 15, Issue 3, March 2026

DOI: 10.17148/IJARCCE.2026.15329

AWS LAMBDA FOR EVENT-DRIVEN MICROSERVICES ARCHITECTURE

Durga Nandhini BJ[1], Dr.S. Shylaja[2]

III BCA, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous), Coimbatore 641006, Tamil Nadu, India[1]

Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous), Coimbatore-641006, Tamil Nadu, India[2]

Abstract: Cloud computing has enabled organizations to build scalable and efficient systems without managing complex infrastructure. Event-driven microservices architecture is a modern approach that allows applications to react to events and process data dynamically. This project demonstrates the implementation of an event-driven microservices architecture using serverless technologies. The system uses Amazon S3 for file storage and event generation, while AWS Lambda processes the uploaded files automatically when an event occurs. Notifications are sent through Amazon SNS, and system monitoring is handled by Amazon CloudWatch. The architecture eliminates the need for server management and allows automatic scaling based on system demand. The proposed system improves efficiency, reduces operational overhead, and enables real-time processing of uploaded data. The results show that serverless event-driven architecture can provide a flexible, reliable, and scalable solution for modern cloud applications.

Keywords: Event-Driven Architecture, Serverless Computing, AWS Lambda, Microservices, Cloud Computing

I. INTRODUCTION

Modern software systems require high scalability, flexibility, and reliability. Traditional monolithic architectures often struggle to meet these requirements because all components are tightly coupled and depend on centralized servers. Microservices architecture has emerged as a solution by dividing large applications into smaller independent services that communicate with each other.

Event-driven architecture further enhances microservices by enabling services to react automatically to events generated by other components. Instead of directly calling each other, services communicate through events, allowing systems to remain loosely coupled and highly scalable. This approach is widely used in cloud computing environments where applications need to process large amounts of data efficiently.

Serverless computing platforms have made it easier to implement event-driven architectures. Services like AWS Lambda allow developers to run code without managing servers. Functions are automatically triggered when specific events occur, making the system highly efficient and cost-effective. This project focuses on implementing an event-driven microservices architecture using serverless technologies.

The proposed system demonstrates how file uploads to Amazon S3 can automatically trigger a serverless function that processes the file and generates notifications. Monitoring and logging are handled using Amazon CloudWatch, which provides insights into system performance. By integrating these services, the system can process events in real time and maintain scalability without manual infrastructure management.

Table 1: Advantages of Event-Driven Microservices Architecture

Feature	Description
Scalability	Services can scale independently based on events.
Loose Coupling	Components communicate through events instead of direct calls.
Cost Efficiency	Serverless computing reduces infrastructure costs.
Flexibility	Developers can modify or add services without affecting others.
Real-Time Processing	Events allow immediate response to system activities.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.471 ⁙ Peer-reviewed & Refereed journal ⁙ Vol. 15, Issue 3, March 2026

DOI: 10.17148/IJARCCE.2026.15329

II. LITERATURE SURVEY

Several studies have explored the benefits of event-driven microservices architecture in cloud environments. Researchers have highlighted that traditional monolithic systems often face challenges in scalability, maintenance, and deployment. Microservices architecture addresses these issues by breaking applications into smaller services that can be developed, deployed, and scaled independently.

Recent research has also focused on the use of serverless computing platforms for implementing event-driven architectures. Services like AWS Lambda allow developers to execute code in response to events without managing servers. This approach significantly reduces infrastructure complexity and operational costs.

Many cloud-based systems use Amazon S3 as an event source because it can trigger automated workflows when files are uploaded or modified. These events can activate serverless functions that process data, perform analytics, or initiate additional services. The integration of Amazon SNS enables systems to send notifications and alerts, improving system responsiveness.

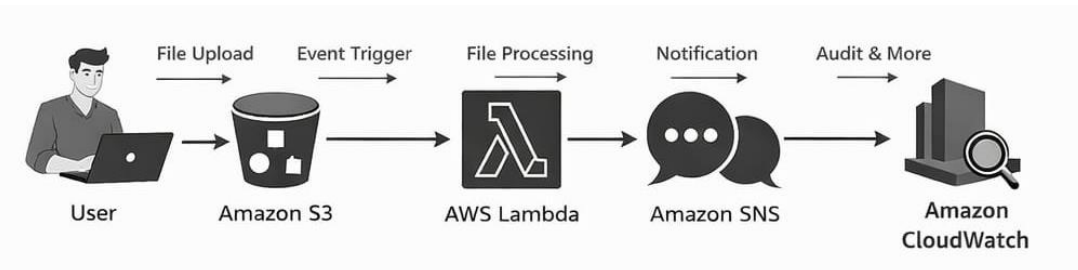
Monitoring and logging are essential components of cloud-based applications. Tools such as Amazon CloudWatch allow developers to track system activity, monitor performance, and detect potential issues. Previous research has shown that combining these services creates a highly scalable and efficient event-driven architecture suitable for modern cloud applications.

III. METHODOLOGY

The methodology of this project focuses on implementing an event-driven microservices architecture using serverless cloud services. The system is designed to automatically process files uploaded by users and perform required actions without manual intervention. The architecture uses cloud services to trigger functions, process data, and generate notifications.

The first step involves uploading files to a cloud storage service. When a file is uploaded, an event notification is generated automatically. This event triggers a serverless function that performs the necessary processing operations. After processing the data, the system sends notifications and stores logs for monitoring and troubleshooting purposes.

The use of serverless computing ensures that the system scales automatically based on workload. Since there are no dedicated servers, the architecture reduces operational overhead and improves efficiency. The integration of different services allows the system to operate as a set of loosely connected components that communicate through events.



3.1 Architectural Design

The architecture of the proposed system follows an event-driven microservices model. The system consists of multiple cloud services that work together to process events and perform automated tasks.

The process begins when a user uploads a file to Amazon S3. This action generates an event notification that triggers a function in AWS Lambda. The Lambda function reads the uploaded file and performs the required processing logic. After the processing is completed, a notification is sent through Amazon SNS to inform users or other services about the completion of the task.

To ensure system reliability, monitoring and logging are implemented using Amazon CloudWatch. This service records execution logs and provides insights into system performance. The architecture ensures that each component operates independently while communicating through events, which improves scalability and system flexibility.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.471 ⁙ Peer-reviewed & Refereed journal ⁙ Vol. 15, Issue 3, March 2026

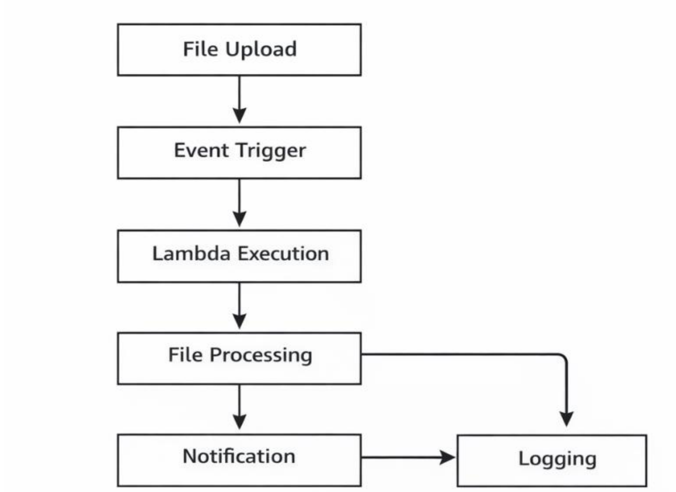
DOI: 10.17148/IJARCCE.2026.15329

3.2 Workflow / System Flow

The workflow of the system describes how events are generated and processed within the architecture. The process starts when a user uploads a file to the cloud storage service. Once the file is uploaded, the system generates an event that triggers the next step in the workflow.

The event generated by Amazon S3 automatically invokes a function in AWS Lambda. The Lambda function processes the file based on predefined logic. This may include reading the file contents, validating data, or performing transformations.

After processing the file, the system sends a notification using Amazon SNS to notify users or other components. Finally, the execution logs and system performance metrics are recorded in Amazon CloudWatch, which allows administrators to monitor system activity and troubleshoot potential issues.



IV. RESULTS AND EXPLANATION

The implementation of the proposed system demonstrates the effectiveness of event-driven microservices architecture. When a file is uploaded to the storage service, the event is detected immediately, and the serverless function is triggered without any delay. The system successfully processes the uploaded file and generates notifications upon completion.

The use of serverless computing ensures that the system scales automatically based on the number of incoming events. Since the architecture does not rely on dedicated servers, it reduces infrastructure costs and improves system efficiency. The integration of monitoring tools provides detailed insights into system performance, enabling administrators to track function execution and detect errors.

The results show that the system can handle multiple events efficiently while maintaining high performance. The architecture also ensures fault tolerance and reliability because each component operates independently. These advantages make event-driven microservices architecture suitable for modern cloud applications that require real-time processing and high scalability.

V. CONCLUSION AND FUTURE SCOPE

This project demonstrates the implementation of an event-driven microservices architecture using serverless cloud technologies. The system uses AWS Lambda to process events generated by file uploads in Amazon S3. Notifications are delivered using Amazon SNS, while monitoring and logging are handled through Amazon CloudWatch.

The proposed architecture eliminates the need for server management and allows automatic scaling based on workload. By using event-driven communication between services, the system achieves high flexibility and reliability. The results confirm that serverless event-driven architecture is an efficient solution for cloud-based applications.

International Journal of Advanced Research in Computer and Communication Engineering
Impact Factor 8.471 ⁑ Peer-reviewed & Refereed journal ⁑ Vol. 15, Issue 3, March 2026
DOI: 10.17148/IJARCCE.2026.15329

In the future, the system can be enhanced by integrating additional cloud services such as data analytics tools, machine learning models, or workflow orchestration services. Security features and advanced monitoring mechanisms can also be implemented to improve system reliability and performance. These enhancements will further expand the capabilities of event-driven microservices architectures in modern cloud environments.

REFERENCES

[1]. AWS Documentation – Event-Driven Architectures with AWS Lambda
https://docs.aws.amazon.com/lambda/latest/dg/concepts-event-driven-architectures.html
This explains how events from services like Amazon S3 trigger AWS Lambda functions in an event-driven architecture.

[2]. AWS Prescriptive Guidance – S3 Event Notifications with Lambda
https://docs.aws.amazon.com/prescriptive-guidance/latest/patterns/subscribe-a-lambda-function-to-event-notifications-from-s3-buckets-in-different-aws-regions.html
This reference describes how Amazon S3 events trigger AWS Lambda and send notifications using Amazon SNS.

[3]. AWS Event-Driven Architecture Solution Guide
https://aws.amazon.com/solutions/guidance/event-driven-media-workflow-automation-on-aws/
Shows real architecture examples using SNS, SQS, Lambda, and EventBridge for event-driven workflows.

[4]. AWS Serverless Workflow Architecture
https://www.swiftorial.com/archview/aws-cloud-native-architecture/aws-serverless-function-workflow/
Explains how Lambda works with services like S3, SNS, and SQS in serverless event workflows.

[5]. AWS Lambda Architecture Overview
https://howik.com/aws-lambda-architecture-diagram-showing-the-event-driven-architecture-and-the-ability-to-integrate-with-other-aws-services
Discusses Lambda's integration with services such as S3, DynamoDB, SNS, and SQS in event-driven systems.

[6]. Amazon S3 – SNS – Lambda Event Driven Architecture Example
https://skundunotes.com/2025/12/05/amazon-s3-sns-lambda-event-driven-architecture-with-terraform/
Example of workflow where S3 upload triggers SNS → Lambda → CloudWatch logging.