International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Serverless Web Application for Task Management

Arun K Divakaran[1], Alan Yuye[2], Haritha P J[3], Merlin Pauly[4], Reeny Zackarias[5]

[1,2,3,4]BTech Final Year Student, Department of Computer Science and Engineering, IES College of Engineering, Chittilappilly, Thrissur, Kerala
[5]Assistant Professor, Department of Computer Science and Engineering, IES College of Engineering, Chittilappilly, Thrissur, Kerala

ABSTRACT

Task management is a critical aspect of productivity in various domains, from individual work to team collaborations. This paper presents the design and development of a serverless web application aimed at enhancing task management efficiency. Leveraging the benefits of serverless architecture, the application eliminates the need for managing infrastructure, allowing seamless scalability and cost-effectiveness.

The application offers a user-friendly interface enabling users to create, organize, prioritize, and track tasks effortlessly. Utilizing cloud-based services like AWS Lambda, API Gateway, and Dynamo DB (or equivalent technologies), the system ensures reliability, scalability, and realtime updates without the complexities of server management.

Key features include task categorization, assignment, deadline setting, and progress tracking, fostering collaboration among team members. Moreover, the serverless architecture enables automatic scaling based on demand, ensuring optimal performance during peak usage without incurring unnecessary costs during idle periods.

The development process involves the use of modern web technologies such as React.js for the frontend, serverless frameworks for backend functionality, and robust authentication mechanisms to ensure data security and user privacy. Through this innovative serverless approach, the application aims to provide an efficient and flexible task management solution suitable for individuals and teams across various industries, optimizing productivity and facilitating seamless task coordination.

Keywords: Serverless architecture, task management, web application, scalability, cloud Services, collaboration, productivity.

1. INTRODUCTION

In today's dynamic and fast-paced work environments, effective task management stands as a cornerstone of productivity and success. The evolution of cloud computing has paved the way for innovative solutions, and one such paradigm shift is the emergence of serverless architectures. This introduction delves into the concept and development of a serverless web application meticulously crafted to streamline and enhance the process of task management.

Traditionally, task management systems often grapple with the complexities of infrastructure maintenance, scalability challenges, and cost implications associated with server-based solutions. However, the advent of serverless computing redefines this landscape by eliminating the need for managing servers, allowing developers to focus solely on crafting functional, scalable, and efficient. The essence of this serverless web application lies in it ability to transcend the limitations of conventional architectures.

By leveraging cloud services to handle backend tasks, such as computation, storage, and database management, the application offers a seamless, responsive, and cost-effective solution for individuals and teams seeking to optimize their task management workflows. Central to this development is the user-centric approach aimed at simplifying task creation, organization, tracking, and collaboration. The application harnesses the power of modern web technologies to provide an intuitive and feature-rich interface, enabling users to effortlessly navigate through their tasks, set priorities, allocate responsibilities, and monitor progress in real-time.

Moreover, the inherent scalability of serverless architecture ensures that the application can dynamically adapt to fluctuating workloads, guaranteeing optimal performance without the burden of provisioning or managing servers. This scalability not only enhances the user experience but also minimizes operational costs by scaling resources precisely when needed. Throughout this exploration, we delve into the architecture, design considerations, and implementation details of this serverless web application for task management. By embracing the serverless paradigm, this application aims to revolutionize the way individuals and teams approach and execute their tasks, fostering efficiency, collaboration, and ultimately, elevating productivity to new heights. Server computing continues to remain the most reliable option in the minds of business owners. Many people prefer the traditional method, especially regarding security and data protection, as it's proven to be bulletproof. However, the increasing adoption rates of serverless computing indicate that server computing has its downsides. Let's explore the benefits and drawbacks of server computing and identify when the traditional option would be favorable.

2. LITERATURE REVIEW

Whether these are bright ideas to pursue, exciting opportunities, or interesting possibilities, most of the people have many more activities on their "wish lists" than the time available to work on them. By choosing activities intelligently, they can make the very most of their time and opportunities [1].The Paper highlights the emergence and growth of serverless computing, a cloud computing model where application logic is broken into functions and executed in response to events. Various cloud providers, such as AWS Lambda, Azure Functions, and Google Cloud Functions, have embraced this concept, making it easier for developers to create applications distributed across multiple cloud services [2].

Serverless computing is a flexible way to access backend services without the need to manage the underlying infrastructure. Users can write and deploy code without worrying about physical servers. They are charged based on actual computation used, eliminating the need to reserve fixed server resources [3]. To construct a straightforward web application, we can harness the capabilities of several AWS services. AWS Dynamo DB serves as the foundational database, providing a scalable and versatile storage solution for your application's data. Complementing this, AWS Lambda offers the means to create functions responsible for handling data read and write operations within the database [4].

The serverless concept is marketed as a way of decreasing development time of an application and at the same time decrease the complexity in development. Many of the stated benefits of going serverless, such as scalability and pay-as-you-go, are advantages when choosing serverless for a smaller back end application [5].

Serverless computing shows good promise for efficiency and easeof-use. Yet, there are only a few, scattered and sometimes conflicting reports on questions such as Why do so many companies adopt serverless?, When are serverless applications well suited?, and How are serverless applications currently implemented?[6]The paper focuses on serverless architecture, which enables businesses to concentrate on their core logic without worrying about infrastructure management. Serverless eliminates the need for server provisioning and can dynamically scale resources to handle incoming requests, thus offering cost-efficiency and scalability [7].

The Online Task Management System is used to automate the process of admin and user management and user task [8]. The work is under observation of the higher authorities. The project provides online platform to accomplish day to day task in a college department. The proposed software will help the student and teacher to communicate with each other.

Cloud computing provides organizations and individuals with a cost-effective utility, empowering businesses by delivering software and services over the Internet to a large user base. According to an IHS report, worldwide spending for cloud infrastructure and services reached an estimated $174.2 billion in 2014, up 20 percent from $145.2 billion in 2013[9].

Serverless computing is a way to run applications and services without managing the underlying infrastructure. It allows companies to focus more on their products instead of worrying about servers and resources [10].

3. BACKGROUND KNOWLEDGE

A serverless web application designed for task management operates on a distributed infrastructure model, eliminating the need for managing server resources. It typically comprises a frontend interface constructed using frameworks like React or Vue.js, offering users a seamless experience. The backend functionalities are powered by serverless computing, employing services such as AWS Lambda, Azure Functions, or Google Cloud Functions to execute code in response to triggers like HTTP requests or database events. Storage of task data often relies on NoSQL databases like DynamoDB or Firestore, while authentication and authorization are managed through services like AWS Cognito or Auth0 to ensure secure access. File storage for attachments might utilize services such as AWS S3 or Google Cloud Storage. The system's API gateway directs incoming HTTP requests to the relevant serverless functions, while monitoring tools like AWS CloudWatch or Azure Monitor track application health and performance. This architecture offers scalability and cost-efficiency by dynamically scaling resources based on demand, enabling developers to focus on application logic without the overhead of managing infrastructure.

4. DISCUSSIONS

SL.NO	PROPOSED MODEL	LIMITATION
1	Prioritize tasks by categorizing them on their importance and urgency.	Misjudgements in prioritization
2	Better performance during high traffic	Debugging & monitoring applications can be challenging
3	Quicker iterations and enhancements to applications	Sharing infrastructure in a multitenant environment might raise security concerns
4	Highly reliable , offering robust infrastructure	Un expected high usage can lead to increased cost

5	Reduces the need for infrastructure setup and management	Reduces the control developers have over the underlying environment

5. CONCLUSION

In summary, the implementation of a serverless architecture for a task management web application brings numerous advantages to both developers and end-users. Firstly, the serverless approach eliminates the need for provisioning, scaling, and maintaining servers, significantly reducing operational overhead and allowing teams to focus more on developing core functionalities rather than infrastructure management. Moreover, the elastic nature of serverless computing ensures automatic scaling based on demand, enabling the application to handle varying workloads without any manual intervention. This scalability feature not only enhances performance but also optimizes costs by charging only for actual usage, making it a cost- efficient solution compared to traditional server-based setups. Additionally, the eventdriven nature of serverless architectures facilitates real-time updates and seamless integrations with various services and APIs. This enables the task management application to respond quickly to user actions, providing a more responsive and interactive user experience. As a result, users can efficiently create, update, and track tasks in a dynamic and responsive environment. Furthermore, the inherent security measures provided by reputable cloud service providers contribute to robust data protection and compliance with industry standards, ensuring the confidentiality and integrity of sensitive task-related information. In conclusion, a serverless approach to task management web applications not only streamlines development and reduces operational complexities but also enhances scalability, responsiveness, costefficiency, and security. Embracing a serverless paradigm presents a promising future for innovative and agile task management solutions in the ever-evolving landscape of digital applications

6. REFERENCES

1. : Jyothi N S, A Parkavi, “A Study on Task Management System” International Conference on Research Advances in Integrated Navigation Systems (RAINS – 2016),April 06-07, 2016,R. L. JalappaInstitute of Technology, Doddaballapur, Bangalore,India

2. :Garrett McGrath, Paul R. Brenner, “Serverless Computing: Design Implementation,And Performance” 2017 IEEE 37th International Conference on Distributed Computing Systems Workshops

3. Vaishnavi Kulkarni, “A Research Paper on Serverless Computing” International Journal of Engineering Research & Technology (IJERT) http ://www.ijert.org Published by : Vol. 11 Issue 09,September 2022

4. : Karan Anand , Mr Ganeshan M, “Construct a Serverless Web Applicationwith AWS Lambda, Amazon API Gateway, AWS Amplify, Amazon DynamoDB, and Amazon Cognito”

5. May 2021| IJIRTVolume 7 Issue 12 | ISSN: 2349-6002

6. : Emma Edlund, “Creating a Serverless Application Using the Serverless Framework and React Deploying a serverless back-end to different cloud providers” Higher Education Diploma in Software Engineering with emphasisin Web Programming September 2022

7. : Simon Eismann, Joel Scheuner , Erwin van Eyk , Maximilian Schwinger , Johannes Grohmann, Nikolas Herbst, Cristina L. Abad, Alexandru Iosup “Serverless Applications: Why, When, and How?” Eismann, S., Scheuner, J., Van Eyk, E. et al(2021).IEEE Software, 38(1): 32-39. http://dx.doi.org/10.1109/MS.2020.3023302

8. : Saloni Gandhi, Anuja Gore, Sakshi Nimbarte and Jibi Abraham, “Implementation and Analysis of a Serverless Shared Drive with AWS Lambda” 2018 4th International

9. Conference for Convergence in Technology (I2CT) SDMIT Ujire, Mangalore, India.Oct 27- 28, 2018: GRISHMA HEDAOO, PRIYANKA THOKE, RAKSHA TABHANE, SHUBHAM MESHRAM, SWAPNIL KUMBHALKAR, PROF. MUKESH BARAPATRE, “Online Task Management System (OTMS)” NOV 2018 | IRE Journals | Volume 2 Issue 5 | : Zahir Tari, Xun Yi, Uthpala S. Premarathne, Peter Bertok, and Ibrahim Khalil, RMIT University “Security and Privacy in Cloud Computing: Vision, Trends, and Challenges”.

10. : Article·November 2023 stats, and author profiles for this publication at: https://www.researchgate.net/publication/375426459 all content following this page was uploaded by Shashi Shekhar Azad on 07 November 2023