



Performance Optimization & Security

Prathamesh N. Dumbare¹, Ashish V. Sonawane², Siddhesh M. Sonawane³, Tejas S. Nalawade⁴

1 2 3 4 Department of Computer Engineering, Samarth Group of Institution College of Engineering Belhe, India

1 prathameshdumbare@gmail.com, 2 sonawane8872@gmail.com, 3 siddheshsonawane2028@gmail.com, 4 nalawadef1@gmail.com,

ABSTRACT

Performance optimization and security are two critical aspects of many applications. With the increasing amount of sensitive information being transmitted and stored online, it has become more important than ever to ensure that data is protected. Encryption and decryption techniques can be used to protect sensitive data, but these techniques can also have a significant impact on performance. In this paper, we explore different methods for optimizing performance ensuring

1. Introduction

This is a web-based application for removing slowdowns, some bugs, and roadblocks in your application. Improve software and application performance. This means that the main motivation for the project is optimizing the performance of web applications.

Introduction to the Project

The rise of the internet and the increasing amount of sensitive information being transmitted and stored online have made security and privacy two critical concerns for many individuals and organizations. Encryption and decryption techniques are widely used to protect sensitive data and prevent unauthorized access. However, these techniques can also have a significant impact on performance. In this paper, we explore the challenges of security in the context of highly concurrency, highly scalable, and low cost web application system. increase. Based on the factors affecting the performance of the web application system, the online mall system project was optimized, and the service support of the web application system was adjusted to better match the system requirements. We have also completed -related SQL statement optimization, Java code layer optimization, user experience layer optimization, and performance testing and analysis. achieving both performance optimization and security in the context of encryption decryption.

Performance optimization is crucial for many applications, as it directly affects the user experience. Slow performance can lead to frustration and decreased productivity, while fast performance can enhance the user experience and increase efficiency. At the same time, security is also essential to ensure that data is protected from unauthorized access, tampering, theft.

In this paper, we focus on how encryption and decryption techniques can impact performance and security, and explore different methods for achieving both. We present an overview of encryption and decryption techniques, the advantages and disadvantages of different methods, and their impact on performance. We also examine the tradeoffs between performance and security and provide recommendations for achieving both. Finally, we present the potential implications of our findings for real-world applications and future research directions. expensive. Traditional frameworks such as SSH frameworks and single server deployments are still employed by most SMB s.

Motivation

The motivation behind this project is given to users by the response time when opening a web application system affected by issues such as system throughput, front-end script error rate and asynchronous request errors. It's about giving the user experience a sense of authenticity. If the above issues exist in the requested user experience. Therefore, you should analyze whether the above problem exists in your system. The number of requests sent by the server is limited, and the load status of the server also determines his service efficiency of the system. Therefore, you should analyze your server to see if there are and configuration aspects of your server.

Problem Identification

Problem will occurs application performance with the progress of technology and society, people's lifestyles are gradually changing, and more and more people use web-based application systems. Access to system services is getting slower and slower, and high concurrency issues are starting to come to the attention of, even though crashes with no response. In just a few years there have been multiple solutions to the high concurrency problem.

Objectives

1. Overall, our goal is to provide a comprehensive analysis of the challenges and opportunities of achieving, performance optimization and security in the context of encryption and decryption.
2. Our findings will be useful for researchers and practitioners who are working on designing and developing secure and efficient systems that can protect sensitive data while ensuring optimal performance.

LITERATURE REVIEW

Existing System

Improving web application performance becomes more important as the number of concurrent users of the application increases. Even if you don't have many concurrent users, there are several reasons to improve your web application's performance. Here are some of the benefits:

1. Improve end-user experience by reducing response time.
2. Future-proof your application.
3. Saves on hosting costs.
4. Reduces the carbon footprint of your application.

The topic itself is so extensive that a book could be written. In this blog post, we'll take a quick look at some common approaches to improving performance. I'll start by discussing load balancing, then some different caching approaches, and finally some examples of other performance tuning techniques.

Disadvantages of Existing System

1. Negative aspects of the present machine.
2. It takes time to apply.
3. Spending too much time online
4. waste of cash and does not enhance product first-rate.

Proposed System of the Design

Problem Analysis

User Experience Layer Problem Analysis

Project system home page is the most frequently requested page by users. On the home page, the browser has to load a lot of data such as: B.: HTML static page, get js and CSS, get user credentials, get .

Server Layer Problem Analysis

By default, the JVM heap memory size and the maximum number of connections requested for a given configuration set in the Tomcat configuration file are low. So the configuration has room for optimization.

Data Storage Layer Problem Analysis

problems include oversold products, frequent order processing, irrelevant data storage, and database parallelism.

Code Layer Problem Analysis

Java provides many highly parallelized development interfaces and classes. Therefore, development and optimization should not only focus on the performance of business logic, but also on the use of related interfaces and methods and related development specifications. Rational use of caching technology in code snippets also improves system performance.

Design

Use the Singleton Pattern: Singletons square measure normally utilized in code development. Using singletons makes loading less costly, takes less time to load, and makes your program more economical. However, you must use the singleton model wherever acceptable. the method for web store improvement adopts the low-coupling, high-scalability Spring framework, and uses dependency injection technology to make singleton instances. In addition, singletons will be used for resource management and knowledge sharing to boost system resource utilization and performance. The Spring framework is employed in an internet store that achieves singleton class loading through annotations. Avoid redundant static variables: In Java applications, static variables don't seem to be reused by the garbage collection mechanism. If additional static variables square measure used, these variables can reside in JVM memory, reducing the offered memory within the system and reducing the concurrency of the server.

Advantages

Prepare for Spikes

If you anticipate rapid data growth, you need to ensure that your database can handle it.

Database Performance Improvements (and Future Prospects)

As your system grows and stores more data, your database will work harder.

Prepare for Business Growth and Change

Business growth, such as acquisitions or significant new contract wins, can impact your business due to increased data volumes and the need for a more resilient database architecture. I have.

Releasing Teams from Fire

If the database shows signs of poor performance, the technical team may need to apply a quick fix.

Ensuring System Recovery Time

Data governance is critical to any business, and database health checks ensure that in the event of a failure, the system can be recovered according to business objectives.

Architecture Diagram

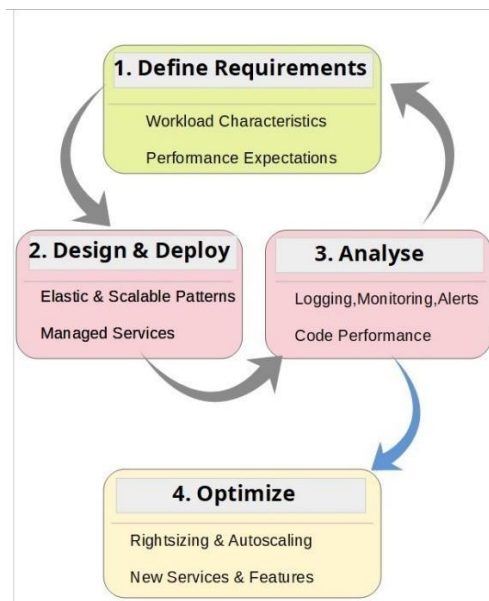


Figure :- Architecture Diagram

Module:- REST API:

Managing a lot of data using a well-designed health information system can prevent medical errors and support doctors and medical service providers in providing the proper diagnosis to patients. This condition is inseparable from advances in data exchange technology commonly used, namely REST and SOAP. The REST API is beneficial in exchanging medical record data faster in real-time. Problems then arise as time goes by, where transactions significantly increase, creating a longer access time. This study solves the problem by adding design pattern technology using a caching pattern. The data retrieval process on the web service is stored in the cache so that when retrieving data, there is no need to re-query the database and then update the cache on the web service and update daily using Cron. This research uses a case study of a healthcare business intelligence system with various data taken from 3 different systems that have been integrated. Tests were carried out in on-premise and cloud server environments with variations between 5,000 and 10,000 data and tested 50 times each. After using the catching pattern, the measurement results of on-premise web services show a reduction in response

time of up to 87%. For further development, an additional service is needed to manage caches that are simultaneously entered into the server so that RAM usage occurs optimally and does not cause data accesstime delays.

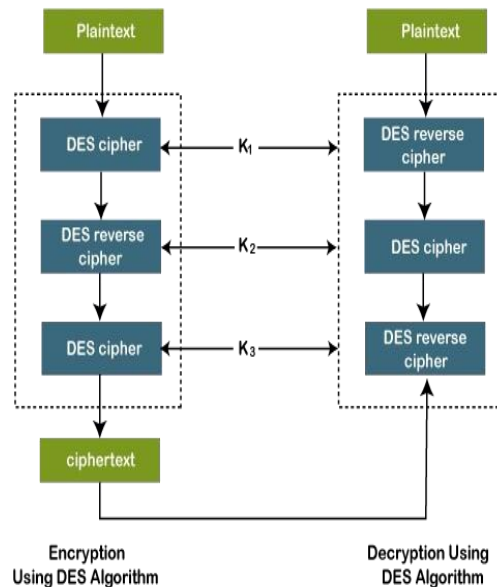


Figure:- Flow Diagram

Conclusion

In this paper, we have explored the important role that encryption and decryption play in performance optimization and security. Our study has shown that by using encryption to protect sensitive data, organizations can help ensure the privacy and security of their users and customers. Additionally, we have discussed the various encryption algorithms and techniques that can be used to protect data, as well as the importance of key management and secure data transfer.

We have also examined the performance implications of encryption and decryption in various scenarios, and have found that the choice of encryption algorithm and key size can have a significant impact on the performance of an application. By using efficient encryption algorithms and properly managing keys, organizations can help ensure that encryption and decryption do not significantly impact application performance.

Overall, our study highlights the importance of a balanced approach to performance optimization and security, where the needs of both performance and security are considered in tandem. Our findings suggest that by implementing effective encryption and decryption strategies, organizations can better protect their users and customers, while still maintaining the performance of their applications. As a result, we recommend that organizations continue to explore and implement encryption and decryption techniques as part of a comprehensive approach to performance optimization and security.

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