

Performance Optimization in Application Development

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ABSTRACT

With the development of information technology, web application systems are being used by more and more companies and institutions. With the increase of user groups, simultaneous accesses will increase and the service quality of the web system will decrease. There are some high concurrency solutions for the , but they only address one aspect of his performance problem, small businesses need to consider the cost. This white paper analyzes the performance factors affecting web application systems at multiple levels with the goal of creating

I. 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.

1.1 Introduction to the Project

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 short years, there have been multiple solutions to the high concurrency problem. Considering the problem of horizontal server expansion, his overseas LiveJournal company proposed a highly parallel web server technology. For high concurrency problems, upgrading physical machine hardware tends to give better benefits. However, since there is a limit to the processing power of a single physical machine, LiveJournal also proposes a partitioned technology that expands the print database according to the demands of the business. With the development of distributed computing and cloud computing, the service capacity of Web

a highly available, 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.

application system is getting stronger and stronger. Web application system performance problems have been solved by relying on distributed services and cloud computing platforms, but still has many problems. Cloud servers are relatively cheap these days, but cloud computing services are relatively expensive. Traditional frameworks such as SSH frameworks and single server deployments are still employed by most SMB s.

1.2 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.

1.3 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.

II. OBJECTIVES

1. Goal Reduce performance issues, avoid poor user experience, and improve bounce rate, performance score, and search rankings.
2. Website performance is a measure of how quickly a website loads. This is one of the most important indicators of online success.
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4. This is one of the most important indicators of online success.
5. The error rate is a calculation that measures the percentage of problematic requests (errors) compared to all requests.

III. LITERATURE REVIEW

3.1 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.

3.2 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.

IV. PROPOSED SYSTEM OF THE DESIGN

4.1 Problem Analysis

1. 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

2. 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.

3. Data Storage Layer Problem Analysis

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

4. 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.

4.2 Design

Use the Singleton Pattern: Singletons square measure normally utilized in code development. Usingsingletons 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.

4.3. Advantages

1. Prepare for Spikes

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

2. Database Performance Improvements (and Future Prospects)

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

3. 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.

4. Releasing Teams from Fire

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

5. 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.

4.4 Architecture Diagram

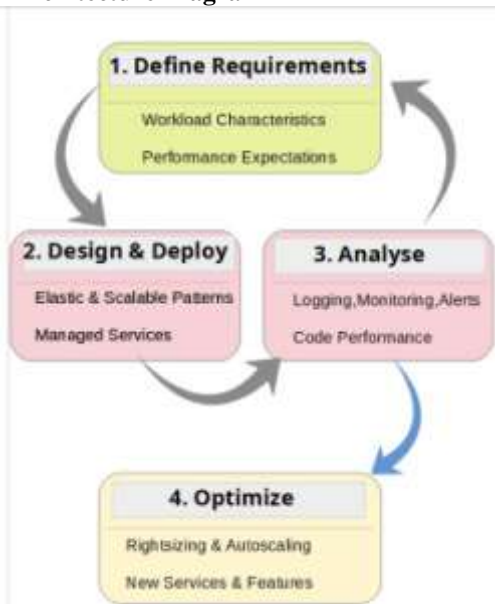


Figure :- Architecture Diagram

V. CONCLUSION

This white paper analyzed the factors that affect the performance of traditional web application systems. This paper analyzes the factors that affect the performance of traditional Web application systems in the case where a large number of users access the system simultaneously across multiple tiers. And we propose, a more popular optimizer according to these factors to optimize the online mall system. From the Web front-end side, from the database index, query

statement and cache optimization to server load balancing, the optimization scheme of the Web application system is provided under high concurrency and implemented in the system. Finally, several load simulation requests using the stress test tool showed a significant performance improvement for the optimized system. Using optimization schemes can significantly improve system performance.

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