Global Server – A Review on Security Issues and Research Challenges

Dr. Mrs. Jasmine Samraj¹ Mrs. Menaka N²

¹Research Supervisor, PG and Research Department of Computer Science, Quaid-E-Millath Government College for Women (Autonomous), Chennai.
²Research Scholar (Ph.D.), PG and Research Department of Computer Science, Quaid-E-Millath Government College for Women (Autonomous), Chennai.

ABSTRACT: The World Wide Web (WWW) and its use are increasing all the time. The significant increase in the number of Internet users, the increasing switchover to online payments, the growth of Internet-enabled gadgets, and favorable demographics are essential elements driving the digital marketing growth story. Overloading of the server can occur under a variety of circumstances. When a large number of people try to access the website and its content, the server may get overburdened. The server is intended to handle specific levels of traffic. Many operations require an excessive amount of bandwidth, while the system consumes an inordinate amount of RAM or runs out of processor power in the other situations. Hard disc speed, RAM, and CPU speed are only a few of the factors that enable the server to handle its load. Virtual memory or hard drive space, as well as bus speeds, may have an impact on how the server handles the load, but neither of these factors is commonly linked to server overload. This paper examines the issues that Global Server faces.


I. INTRODUCTION
Cloud Computing is an emerging platform in the area of information technology that faces a number of issues, including load balancing as well as confidentiality. Organizations with substantial experience in dealing with server-side issues, most firms will eventually face an overcrowded web server. An overload, on the other hand, can be highly disruptive for a company that is new to identifying and responding to server issues, costing visitors, money, and reputation. Internet applications are pervasive nowadays, and they have become vital for both individuals and businesses. This significance is reflected in the high demands placed on these applications’ performance, availability, and dependability. For many websites, an overwhelmed server is a sneaky problem: Regardless of the type of hosting, there are a few issues that arise frequently and may be avoided from the start. To protect users' information, Internet applications enable sophisticated web content and security capabilities. Server capacity planning is the practice of optimizing current and future server performance by utilizing the knowledge of existing server capacity consumption. Subspace identification method is used to create a big data distribution model for website network user traffic data, and neural network identification method is used to conduct actual statistical analysis of website network traffic data [1]. A site’s traffic is the number of visitors it receives. The links between website traffic and quality have not received as much attention as the linkages between Web hyperlink data and similar performance indicators.

Load balancing is among the most difficult problems that exist today. Load balancing is defined as a strategy for evenly distributing workload across all nodes in order to avoid situations where some nodes are substantially busy while others are utilized or idle. The load balancing mechanism has a significant impact on the system's performance. In cloud computing, effective load balancing ensures that cost of accessing the cloud providers’ resource is decreased and resources can be made readily available based on user demand. The resources can be easily exploited by the users depending on the high/low load. When there is a low load, energy can be saved.

II. LITREATURE REVIEW
Workspace within a data centre is one of the top data centre challenges. Poor planning for data centre physical infrastructure can have substantial and long-term consequences, whether it's insufficient capacity, much more space, or overheating due to hardware proximity. William V. Wollman, Harry Jegers [4] describes Global Server Load Balancing (GSLB) improves application performance by allowing the client to choose a server depending on server performance, network speed, and the client and server's approximate network location. Vijender Kumar, Gowri Anand [5] explains External memory subsystems probably benefit from SAS, giving businesses flexibility and cost reductions previously unavailable in traditional storage setups. The native dual port functionality of each SAS drive, which enables an alternative path to every drive in the case of a controller failover, is an essential benefit of SAS-based storage subsystems. With increasing workloads, storage requirements will keep rising. Scaling up the hardware at regular intervals is the only way to increase the storage space of servers. Hosting services are those that are not shared. Organizations are secure because they have entire authority. They can be required to deliver high-end performance as long as they are costly [6]. Processing times may increase to intolerable levels during overload conditions, and power strain may lead the server to act abnormally and perhaps even crash, resulting in service denial. Such server behavior in e-commerce systems could result in significant cost overruns [7].

III. CHALLENGES FACED BY GLOBAL SERVER
- Data Security
- Capacity Planning
- Uptime and performance maintenance
- Slow website loading and Navigation speed
- Site outage and downtime

**DATA SECURITY**

Data Security issues are popping up left and right these days. As a result of these security issues, a variety of encryption algorithms have emerged. Simultaneously, many security products placed in the internet create a significant amount of log files every day, and figuring out how to discover knowledge and it has been a pressing concern. Cloud servers are complicated because security contents need to be handled secretly while adhering to a single comprehensive security strategy. The intruder simply needs to attack one level that is less secure in order to gain access to another device. Software and hardware security are two types of security. Hardware security is a broad term that refers to a variety of processes and tactics being used to keep outsiders out. Trying to deceive the firewall, snatching credentials, or exploiting similar flaws takes place through software; hackers can be blocked from approaching the organization by software security. Here data governance is required to ensure that every data is authorized and every data has an authorized owner who can edit and read data. Every data should indeed be delivered following adequate certification and handshakes among transmitter and recipient to ensure data is being sent to the right location by the authorized sender. To ensure security, all data must be transmitted over a secure channel with encryption [8]. Every security flaw may result in the loss of dollars in millions in property rights, confidential data leaking, and sensitive data breaches. The data security management system which employs data mining and fusion technologies has a better performance. Figure 1 illustrates the data transmission flow where security has to be implemented.

![Figure 1: Overview of Data Transmission through Servers](image)

**CAPACITY PLANNING**

Capacity Planning is an effective method for ensuring high-quality service on the Internet. Modern cloud services provide a wide range of IT services, the majority of which are stored on specialized web hardware. Virtualization is a special measure for consolidating servers, resulting in higher server usage. There is a great deal of information available for the virtualized environment, but the sophistication of a virtual environment resists simple metrics. More Direct Attached Storage (DAS) to a server adds complexity to management, and it doesn't answer numerous data security or elevated difficulties, and it's frequently restricted by simple capacity constraints. Data centre managers are prone to over-provisioning in order to prevent failure [9]. As a result, there is a waste of power and energy. The capacity of a data center has always been an unanswered topic for data centre management as the amount of data has grown. As the proportion of people has grown, so has the increase in complexity. Phone application configurations are starting to move more of the data to be processed from the end user device back into the data centre. People do not plan for millions of similar things rather unique ones. Data centre managers can utilize a DCIM system to discover unused physical space, capacity, electricity, cooling, and other resources in a data centre. This makes it simple to increase capacity while lowering expenses, conserving energy, and avoiding downtime.

![Figure 2: Overview of Load Balancing and Management](image)

**UPTIME AND PERFORMANCE MAINTENANCE**

In today's modern digital revolution, having a strong and well-functioning Webpage gives a unique offering the opportunity to connect clients all over the world. To get the most out of a company's Web investment, it's vital to make sure that all of the aspects of the site are working effectively. As a technique of stability, scheduling, and evaluation, networks and network surveillance is a vital and critical component of any Digital strategy. In a very volatile environment, website services flourishes. Network outages as well as other problems were unavoidable realities. In the website hosting market, however, downtime is
devastating, and it might even spell the end for a client's business. The accepted practice for web hosting is 99.9% uptime. It's catastrophic to have more than 10 minutes of downtime per week. Hardware and software breakdown, data leaks, and administrative faults are the major causes of unexpected, emergency downtime. Planned downtime, which is unavoidable, is best carried out at night or during off-peak hours, when the number of visitors to the website is often at its lowest. Installing reliable software and updating it on a regular basis can avoid glitches on the network. Using high-quality, tried-and-true computer hardware prevents degradation by conducting a regular system integration assessment. Authentic analytics-driven surveillance strongly relates to self-healing data centers that can take action like unplugging a host or reconfiguring transmitted data before the alert.

Figure 3: Overview of Load Balancing and Management

SLOW NAVIGATION SPEED AND WEBSITE LOADING TIME
Consumers are unlikely to continue to a website that takes too long to load or has sluggish internal navigation. According to studies, the timeframe a person can await without dropping attention ranges between 0.3 and 3 seconds. That means the data should be displayed to the consumer within three seconds. Five out of every six web users will abandon a site that takes longer than four milliseconds to respond. To complicate things worse, slow website load has a negative impact on Google ranks, leading to a slow decline. The HTTP demand and return processing is lengthened each moment during page switches to another location. The finest server companies use a variety of tactics to prevent WebPages from responding slowly like, acquiring alternative computers throughout the universe. The precise environment of the data centre storing the webpage has a considerable impact on the loading time. The quicker the webpage loads, the closer the data centre serving the server is to the specified location. Unnecessary extra objects in the database, such as records, acoustic noise, and other files from extensions or customizations, are referred to as "overhead." SQL queries can take more time than required if there is too much "overhead." It can even cause the http server to time out while searching for a database update in some instances. Graphics and films are common examples of huge media files. Compression reduces the size of the files and improves loading speeds.

Figure 4: Flow of Speed and Quality of Connection from User’s End to Server

SITE OUTAGE AND DOWNTIME
Whenever a webpage is fully unreachable or not able to execute its principal function for its visitors, it is said to be unavailable. The outage's duration is known to as the server outage. If a webpage is maintained on a central server, its host may stop or remove the page to safeguard competing websites if there really is a large increase in traffic. This unusually high level of web traffic might indicate an attacker or Trojan effort to trigger a significant disruption. DDOS (Distributed Denial of Service) attacks are attempts to take down a website by sending a high quantity of false activity via a cluster of devices. As a result, if the site's security measures aren't up to date, the site is extremely susceptible to outbreak. In the lack of a regular hardware system service and support schedule, an unexpected breakdown could occur, resulting in downtime. The uptime of a hosting company cannot be guaranteed. Server outages have been reported on various social media networks, including Instagram, Facebook, WhatsApp and Twitter occasionally. Because of the rapid rate of technological changes, businesses choose to invest in incremental improvements rather than replacing complete servers to save money. Long periods of downtime are essential to replace servers; however it is often required to cope with the new web.
IV. CONCLUSION

Global Server faces a number of issues, which are described in this paper. Data Centers with a large number of servers must be protected. When using cloud technology, work load balancing must account for both over- and under-load situations. Server Downtime, Capacity Planning, Maintenance Management is also described in this paper. To ensure data flow security, an overview of data transfer between a server and client is discussed. It is necessary to create a framework with high-potential policies to strengthen data security and to overcome all the issues as described.

REFERENCES