iJRASET
International Journal For Research in
Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** IV **Month of publication:** April 2022

DOI: https://doi.org/10.22214/ijraset.2022.41497

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

Data Sharing with High Security on an Edge Server by Intelligent Internet of Things Users

Manthan Singh[1], Dr. Sachin Kumar[2]
[1]MTech, Computer Science and Engineering Tula's Institute, Uttarakhand Technical University, Dehradun, Uttarakhand, India
[2]Assistant Professor, Department of Computer Science, Tula's Institute, Uttarakhand Technical University, Dehradun, Uttarakhand, India

Abstract: New needs are being created regularly as a result of technology improvements. The internet is one of these tools. To take it a step further, they created the Internet of Things (IoT), which is used to connect smart objects to the internet to facilitate communication. It is linked to the cloud, which stores all of the data created by it, allowing smart devices to operate more efficiently. This further enhances the advantages of the item. Smart devices communicate with edge servers, which are located close to them and capable of performing communication and security functions. With this thesis, an attempt is made to shorten the amount of time it takes to search in a secure cloud on an edge server. The discoveries that have been proposed allow for an extension of time without jeopardizing security issues. This creates a more user-friendly interface for securely engaging with and exchanging data, as well as searching for and downloading data from a secure server in less time, all while maintaining security.
Keywords: IoT, Server, Edge, MySQL, Java

I. INTRODUCTION

With the Internet of Things, we have reached the next important phase in the development of the internet, which Ashton pioneered in 1999. Real-world physical equipment would be connected to the internet in this scenario. They have the benefit of being able to be controlled from any location on the planet. For example, suppose A forgets to turn off the lights in his room before leaving for work on Monday morning. Someone may use the Internet of Things to turn off the lights in his or her office, saving money, time, and energy in the process. It may be used in large-scale intelligent physical cyber settings with a high level of intelligence. The outcome is the generation of a large amount of data, which requires storage space to be used for further analysis and processing. Because of its limited storage capacity, the Internet of Things is unable to provide large volumes of data storage. As a consequence, we use cloud computing in combination with traditional computing. When using cloud computing, you may store a big quantity of data in an easily accessible location. Aside from that, their accessibility and processing skills are boosted by the fact that they are available on demand. It is necessary to have real-time data processing and low latency when using the cloud in combination with IoT. These are features that the cloud cannot provide by itself. Edge servers, which are positioned close to Internet of Things devices and provide extra services such as communication, data processing, and storage, help to alleviate the aforementioned issues.

A semi-trusted device is a device that may be found in many places such as a mobile phone, personal computer, or freestanding server. They are located close to the cloud and are responsible for security operations. Users transmit data that must be protected from malicious attacks in IoT apps, making it vital to maintain security in these applications. It is advantageous to adhere to the CIA's three principles of secrecy, honesty, and accessibility. To guarantee confidentiality, only authorized users are granted access to the information. The integrity of data guarantees that it keeps its original form. When the data is made public, the user is not prohibited from access to the information.

II. LITERATURE REVIEW

Researchers are striving to improve the security of data interchange and search in the Internet of Things applications, but there are now only a limited number of solutions accessible. An ultra-lightweight cryptographic system for data sharing by smart devices at the edge of a cloud-based internet of things, as well as an approach for safeguarding data searches by authorized users at the storage level was suggested by M. B. Mollah and colleagues[1]. Thirumoorthy d. and colleagues[8] proposed a framework for safeguarding data while sharing and locating it via the use of Data in cloud-based services. An investigation on the security and privacy issues of fog computing was carried out by Yi S. and colleagues[2].

Using the least processing cost first technique[3], Sridevi B. solved the issue of data security while looking for and sharing data with other researchers. According to the researchers, a more secure system for data sharing at the edge of the cloud-aided internet of things has been developed[4].

For Internet of Things applications, Rameshwaraiah K. and colleagues[5] have developed a distribution strategy for securely exchanging and searching data that is based on a distributed computing model. Y. Tao et al. [6] established a technique for securely sharing and finding data in cloud edge collaborative storage (CECS), which is a kind of distributed storage.
C. Pravallika and colleagues [7] provide a technique for securely transmitting and searching data in the Internet of Things devices. Singh J. et al. investigated the security problems related to the Internet of Things, taking into consideration cloud tenants, end-users, and cloud providers[9] in their research. Yi S. et al. have investigated the obstacles and aims of fog computing in combination with its implementation[10], and their findings have been published.

III. PROPOSED WORK

As part of the enhancement, this work introduced the notion of cache memory; whenever a user makes a query to the cloud server, the cloud server runs a search operation on the stored data and returns the result to the user. If a user submits the same query again, the cloud server will do the same action each time, incurring excessive compute costs and resource waste.
Maintain cache memory for all past searches to circumvent this problem. Whenever a user performs the same query, the cloud server retrieves the results from cache memory rather than doing the calculation again. Fig 1 illustrates a data flow diagram.

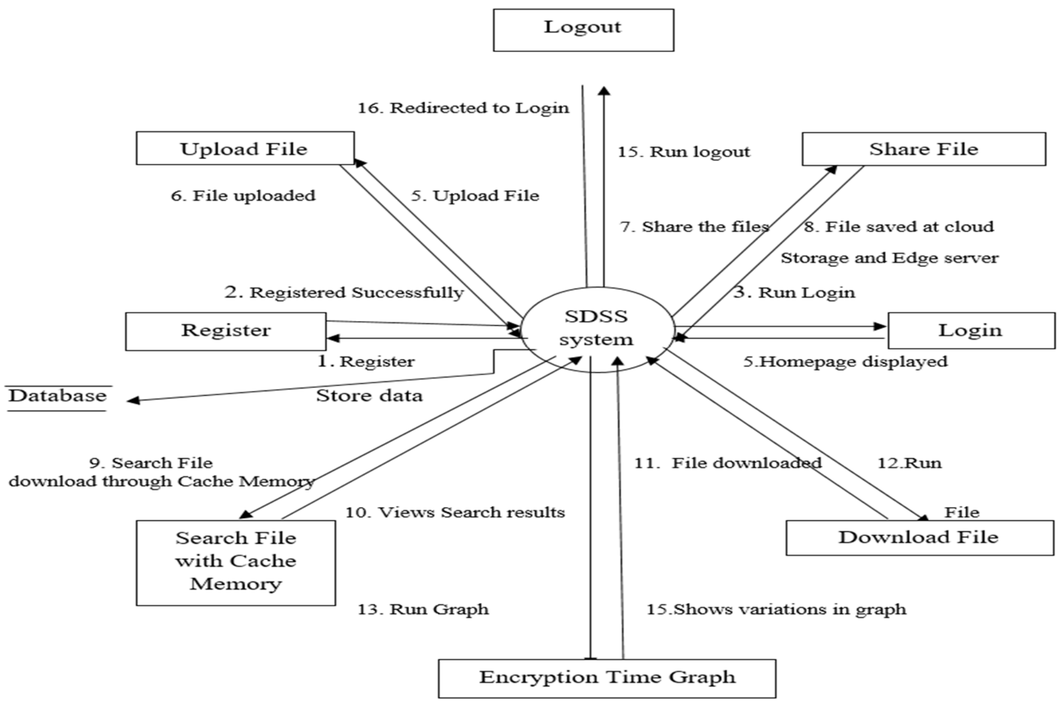

Fig.1.Data Flow Diagram

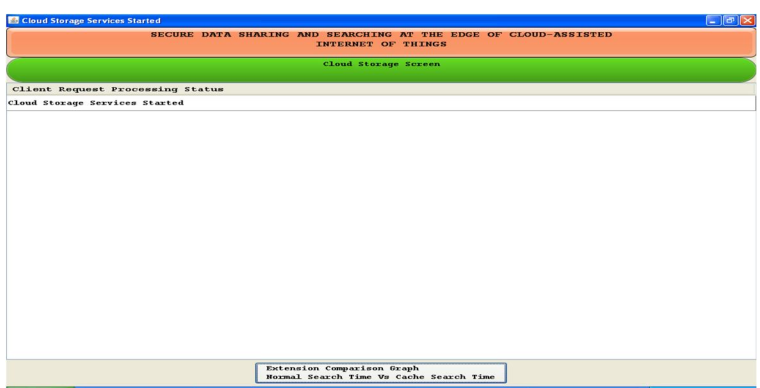

Fig.2.Screen for Cloud Storage Services

Fig.2 shows the Cloud server screen with a button to display the extension work graph.

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

See the below screen for a search operation in fig.3.

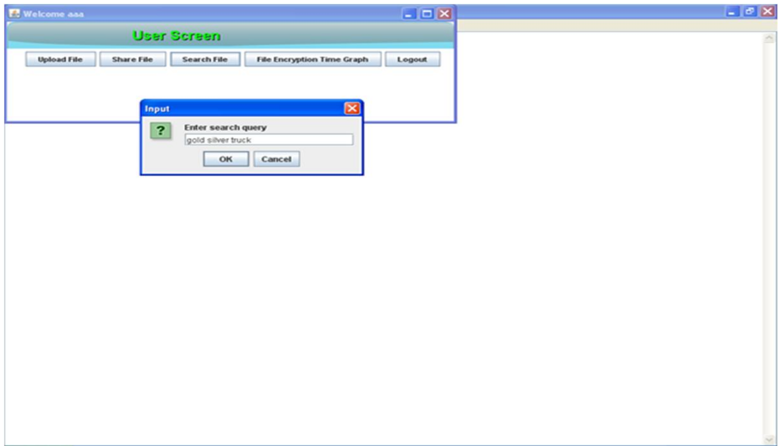

Fig.3.Search Query

In the above screen of fig.3 I gave the query as 'gold silver truck', and this query is not available in the cache, so the cloud server will perform the entire search computation and send the result back to user.

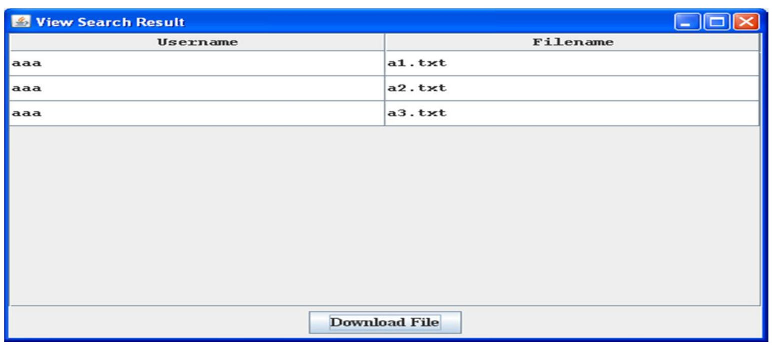

Fig.4.Search Results

Above the screen, it is showing the search result in fig.4.

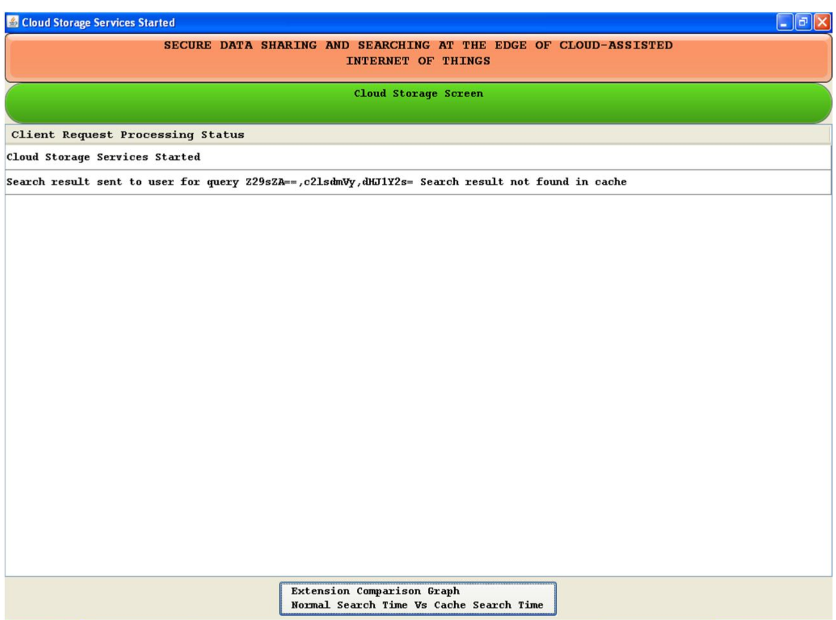

Fig.5.Search Results

In the above screen, fig.5 at the cloud side shows status as search not found in cache. If I execute the same query again, then Cloud will obtain the result from the cache seen in fig.6.

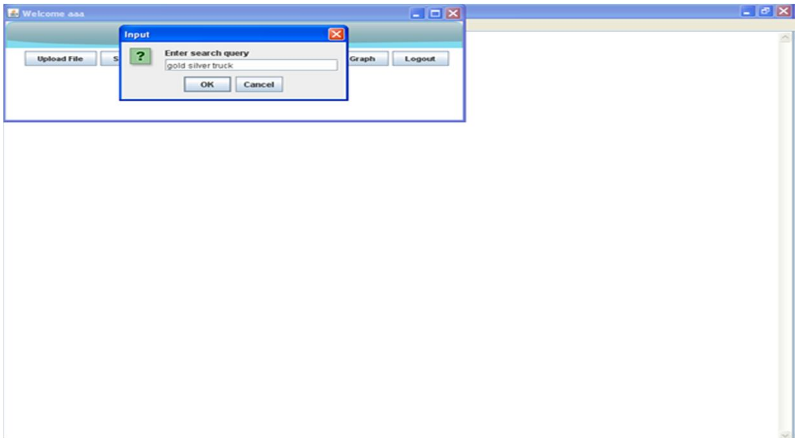

Fig.6.Search Again with Cache

Below is a search screen for the result with cache memory saving in fig.7.

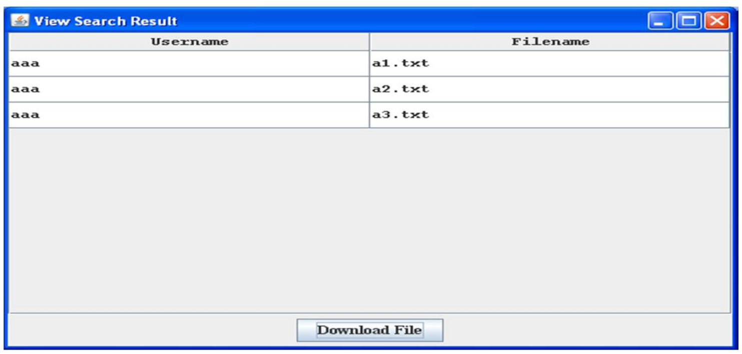

Fig.7.Results for search from Cache

IV. RESULTS

The primary result parameter is the edge server's search time. This was accomplished by incorporating cache memory into the edge server. It will establish a memory for previously saved material and increase the speed with which the searched phrases are processed. It is very advantageous when a large text file is uploaded to the server. The other outcome parameter is security, which is accomplished in the early work through a key agreement procedure and hash method. The graph in fig.9 illustrates the improvement over the previous strategy. On the cloud side, the search status is shown in fig.8 below.

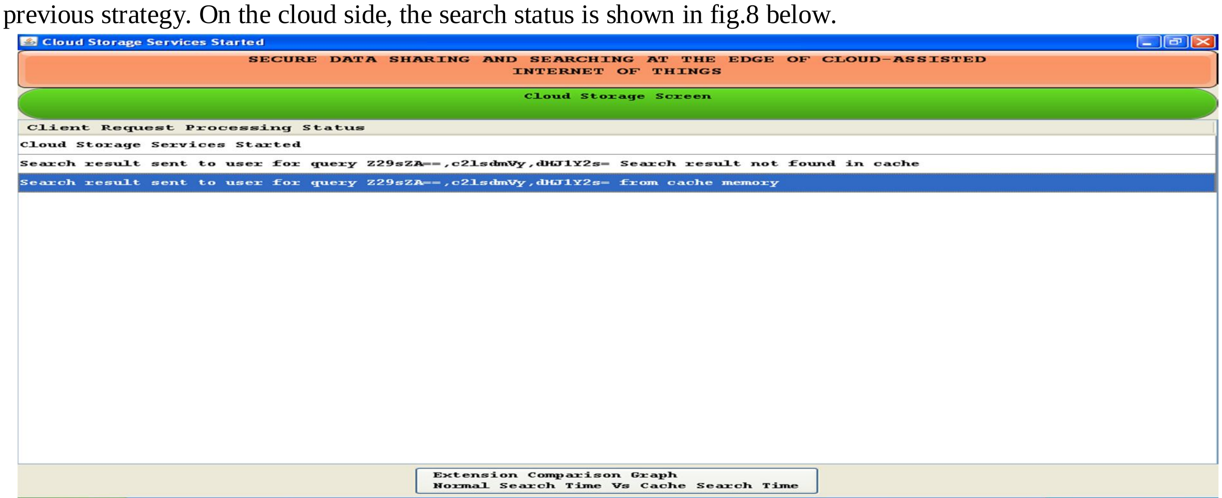

Fig.8.Result in Cloud Server for search from Cache

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

By clicking on the 'Extension Comparison Graph' button, one can see the execution time for both cloud complete search and cache search in the visual graph in fig.9.

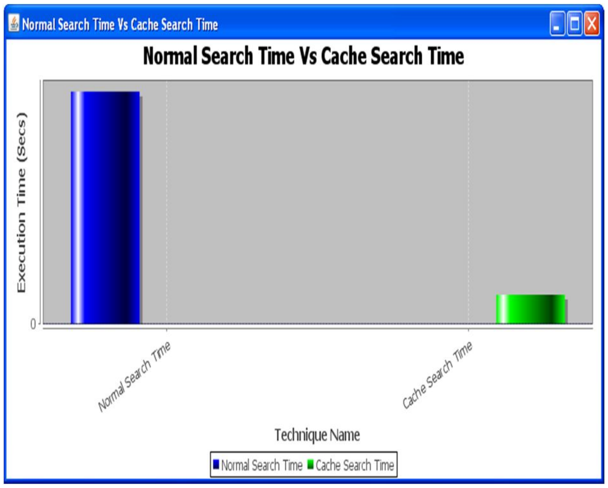

Fig.9.Result Graph for Faster Speed

In above graph shows that normal search took from execution time compared to cache search.

V. CONCLUSION

This paper proposed a lightweight cryptographic and speedier framework for IoT-enabled handsets to exchange data at the pinnacle of cloud-assisted IoT. All security-related tasks are delegated to a network of exhausting outskirt PCs. This thesis examines the criteria outlined above regarding current choices for asset-restricted intelligent devices. A data search framework for locating and sharing relevant data by authorized buyers in databases where all data is encoded, despite early concerns about information sharing security. Additionally, the security and speed of execution investigations demonstrate that the proposal is realistic and reduces the costs of all companies in our framework for counting and communication. The whole system is safe, quicker, and encrypted successfully in all cloud storage formats.

VI. ACKNOWLEDGMENT

The author directly acknowledges Tula’s Institute, Dehradun, Uttarakhand, India. Also thanks to Dr.Sachin Kumar for his guidance and encouragement throughout the work.

REFERENCES

[1] SivannarayanaNerella, G.Sateesh “Confederate Process Key Agreement Scheme For Cloud Assisted Vehicular Internet Of Things” International Journal of Research in Advent Technology, Special Issue, March 2019 E-ISSN: 2321-9637.
[2] C. Pravallika, P. Sukanya “Secure Data Sharing and Searching at the Edge of CloudAssisted Internet of Things” International Journals of Advanced Research in Computer Science and Software Engineering ISSN: 2277-128X (Volume-8, Issue-4),2019.
[3] Hind Bangui, Said Rakrak, Said Raghay, and BarboraBuhnova “Moving to the Edge-Cloud-of-Things: Recent Advances and Future Research Directions" Electronics 2019, 7, 309
[4] L. Minh Dang and Hyeonjoon Moon “A Survey on Internet of Things and Cloud Computing for Healthcare” Electronics 2019, 8, 768.
[5] Champa H N and Sampath Kumar YR “An Extensive Review Sensing a Service Paradigm in IoT: Architecture, Research Challenges, Lessons Learned and Future Directions” International Journal of Applied Engineering Research.
[6] Sukhpal Singh Gilla, Peter GaDr.K. Praveen Kumarrraghan, RajkumarBuyy “Fog enabled cloud-based intelligent resource management approach for smart home IoT devices” Institute of Electrical and Electronics Engineers 2019.
[7] FaguiLiu, Zhenxi Huang and Liangming Wang “Energy-Efficient Collaborative Task Computation Offloading in Cloud-Assisted Edge Computing for IoT Sensors” Received: 22 January 2019; Accepted: 26 February 2019; Published: 4 March 2019.
[8] ShreshthTulia b, RedowanMahmuda, ShikharTuli c, RajkumarBuyya “FogBus: A Blockchain-based Lightweight Framework for Edge and Fog Computing” International Research Journal of Engineering and Technology (IRJET), Received 2 October 2018 Revised 13 March 2019 Accepted 12 April 2019 Available online 13 April 2019.
[9] FanBi, SebastianStein, et al., ”A Truthful Online Mechanism for Allocating Fog Computing Resources ”AAMAS 2019, May 13-17, 2019, Montréal, Canada.
[10] Igor Leão dos SantosA, Flávia C. DelicatoB, Paulo F. Pires B, Marcelo PitangaAlvesC, Ana OliveiraD, Tiago SalvianoCalmonD “Data-Centric Resource Management in Edge-Cloud Systems for the IoT “Open Journal of Internet Of Things (OJIOT) Volume 5, Issue 1, 2019 ISSN 2364-7108.