*2018 3rd International Conference for Convergence in Technology (I2CT)*
*The Gateway Hotel, XION Complex, Wakad Road, Pune, India. Apr 06-08, 2018*

# Comparative Study on Decentralized Cloud Collaboration(DCC)

Nikethan Selvanathan
Computer Science Department,
Informatics Institute of Technology.
55, Ramakrishna Road, Wellawatte, Sri Lanka.
nikethan.2014272@iit.ac.lk

Guhanathan Poravi
Computer Science Department,
Informatics Institute of Technology.
55, Ramakrishna Road, Wellawatte, Sri Lanka.
guhanathan.p@iit.ac.lk

*Abstract*—**Cloud collaboration is a billion-dollar industry, for sharing, storing, and co-authoring files. In the current age of information technology, cloud collaboration expects to see a significant amount of growth, as more organizations look to leverage the benefits of the industry specifically in the areas of flexibility, cost-efficiency, and security[1]. However, existing systems basically operates in a centralized cluster to achieve high performance, though they have a demand solving indisputable benefits, there are several inherent weaknesses such as high server costs for service providers, illegal data mining in trust-based architecture, security loopholes, and unethical government surveillance. Therefore, a large-scale resource sharing decentralized system can mitigate these traditional server expenses, data failure, and outage, as well as the enhanced security, and privacy of data. This dissertation presents a background to the problem, its impact on adaption, existing research background, and proposing design for storing, sharing, and coauthor files. The Design presents a decentralized resource (storage and network) sharing system, with real-time collaborative editing, peer (node) management, and redundancy schemes to manage fault tolerance of the distributed storage.**

*Index Terms*—**Peer-to-Peer (P2P) System, Decentralization, Blockchain, Distributed Hash Table, Cryptography, Fault Tolerance Distributed File Storage, Security.**

## I. INTRODUCTION

Cloud Collaboration is a way of sharing and co-authoring files, in which the files are uploaded to a remote storage.The benefits of collaborative system are we well-documented, such as flexible interaction, faster decision making, ubiquitous access, improved morale, time/costs reduction, and smaller carbon footprint[3]. According to the survey conducted by Craig et al. [2], on average, an organization today uses 214 file sharing, and collaboration services, which is one of the many indicators towards the massive adoption to cloud collaboration.

Nevertheless, the challenge in collaborative system has always been to create necessary framework cost effectively, flexibly, dynamically, seamlessly, and securely bring collaborators together [4]. Analyst Gartner [2], predicts that cloud office systems, will account for 33% of the overall office market by 2017. Prime examples of cloud collaboration service providers are: Google Drive, Onedrive, Dropbox, etc.

Despite the indisputable benefits provided by collaboration services, there are inherent weaknesses -such as high server costs for service providers, illegal data mining in trust-based architecture, security loopholes, and unethical government surveillance.

## II. ISSUES IN CURRENT SYSTEM

In this section, authorfurther elaboratesthe weakness of the overall architecture of current cloud collaboration.

### *A. High Server Cost for Service Providers*

The most popular cloud collaborativesystems currently operatein a centralized cluster (client-server architecture) to achieve high performance, nevertheless the primary downside to a client-server architecture is its cost (servers can become very expensive) and professionals cost of work.Thus, resulting ineven higher non-intellectual property expenses. According to Michael [5], Dropbox estimated to use up to \$2.5M - \$3.4M per month onnon-intellectual property.

To cope with the demands placed on cloud collaboration by over 2.4 billion connected people [6], current service providers make use of data center topology, and edge computing. Nevertheless, according to Koomey [7], in 2010 data centers use between 1.1% and 1.5% of the world's electricity (growing at 60% per annum). Thisrepresents significant expenditure for data center owners, and providers. Thus, cloud collaboration where central intermediaries store and provide access to data can be expensive, and inefficient.

### *B. Illegal Data Mining in Trust-Based Architecture*

Trust-based architecture is where a Trusted Third Party (TTP) act as an intermediate medium between critical communications between users. Thus, users rely on TTP to secure their critical communications and interactions [8]. Nevertheless, the legal implications of data held by these TTP’s are complex and not well understood. Thus, there is a potential for lack of control and transparency of data held by TTP.

The service provided by TTP represents an insurance for security and availability of the data, but due to a single point access control,and legal implications, privacy of data can get violated by illegal data mining by the service provider for advertising and marketing[9]. E.g.:Google analyzes the content of all the document and files on its network and selling byproducts to advertisers [10]. This is a serious breach of privacy where users store sensitive data.

**978-1-5386-4273-3/18/\$31.00 ©2018 IEEE**

Authorized licensed use limited to: Informatics Institute of Technology. Downloaded on May 26,2020 at 04:43:25 UTC from IEEE Xplore. Restrictions apply.