INFORMATION CRUNCHING AND STORAGE ENHANCEMENT APPROACH

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ABSTRACT

The paper presents a multi-layered data compression framework that reduces the amount of data before being stored in cloud. At present, Internet of Things (IoT) has gained noticeable attention due to the approaches and advancements towards smart city aspects. With increasing number of devices and sensors connected to the Internet, tremendous amount of data is being generated at every moment which requires volumes of storage space to be stored. However, Data compression techniques can reduce the size of the data and the storage requirement by compressing the data more efficiently. In this article we introduced a two layered compression framework for IoT data that reduces the amount of data with maintaining minimum error rate as well as avoiding bandwidth wastage. In our proposed data compression scheme, we got an initial compression at the fog nodes by 50% compression ratio and in the Cloud storage we have compressed the data up to 90%. We also showed that the error is varied from the original data by 0% to 1.5% after decompression.

Keywords: **IoT, Data Storage**

INTRODUCTION

IoT is a network paradigm that connects things (e.g., smart phones, smart TV, home appliance, online healthcare etc.) to the Internet. In recent years the number of IoT devices increased 31% year-over-year to 8.4 billion in 2017 and it is estimated that there will be 30 billion devices by 2020. As a result, enormous data is continuously being generated from these devices. To store and process these large volume data, IoT is integrated with Cloud Computing which has virtually unlimited storage space and processing capability. Cloud computing eases the work-flow with unlimited resources and helps to build efficient frameworks such as storing a large volume of images for further processing. But the large volume data needs larger amount of storage space and larger amount of energy during transmission through the network. So here comes up the need of data compression to reduce the storage requirement of IoT data. There are two types of data compression techniques- lossless and lossy data compression. In lossless compression techniques, the compressed data can be retrieved exactly to the original data. The Lempel Ziv (LZ) compression methods are one of the most popular algorithms for lossless compression. On the other hand, in lossy compression system, the decompressed data is not exact to the original data and there might be little variation in error rates. For example, JPEG image compression is a well-known lossy compression technique that works in part by cutting off less important bits from information. IoT data are heterogeneous and different in characteristics considering different environments and needs. To compress these data a two

layered lossy data compression approach is introduced that can be used for any kind of IoT environment. This means the data will be compressed in two steps- initially, at the fog node and later in the cloud storage. Fog Computing is a highly virtualized platform that provides computation, storage, and networking services between end devices and traditional Cloud Computing Data Centers, typically, but not exclusively located at the edge of network. As we are compressing data in Fog initially, less energy will be consumed during the data transmission from Fog to Cloud. Because we know that big size of data required more energy during transmission. Another aspect is, due to this compression bandwidth consumption will become less during data transmission from Fog to Cloud.

LITERATURE SURVEY

To provide higher life quality for people in developing countries through the use of web and embedded systems, healthcare information should be online and accessible from anywhere in the world and the system should be affordable to mass people. This research examines wireless sensor network with real-time remote identification and monitoring of regular and critical healthcare information using low-cost RF based infrastructure for homes and community healthcare canters. The integrated platform is employed to build multi-physiological signal processing, data acquisition and remote monitoring. The proposed system enables remote observers to use medical care information through the use of web and mobile application platforms which increase the portability of monitoring system therefore reducing the overall hospitalization cost. A prototype system is developed to verify the functionalities of design and test runs yielded significant promise

An effective application framework design for e-governance is definitely a challenging task. The majority of the prior research has focused on designing e-governance architecture where people identity verification takes long time using manual verification system. We develop an efficient application framework that verifies people's identity. It provides cloud- based REST API using deep learning-based recognition approach and stores face meta data in neural networks for rapid facial recognition. After each successful identity verification, we store the facial data in the neural network if there is a match between 80–95%. This decreases the error rate in each iteration and enhance the network. Finally, our system is compared with the existing system on the basis framework. We implement and evaluate our proposed framework which allows any organization and institute to verify people identity in a reliable and secure manner.

The amount of data produced and exchanged in the Internet of Things is continuously increasing. The associated management costs for information transmission and classification are becoming an almost unbearable burden due to the unprecedented number of data sources and the intrinsic vastness of the dataset. In this paper, we propose a novel lightweight approach capable of alleviating both aspects by leveraging on the advantages offered by extraction methods for constrained devices, proposing a simple and effective solution for the problem. We validate our approach with an extensive simulation campaign thoroughly spanning the system parameter set. This work paves the road ahead for the realization of a universal signal processor for constrained devices in the Internet of Things, which will be capable of appropriately handling any given data while at the same time increasing communication efficiency

SYSTEM ANALYSIS

EXISTING SYSTEM

A number of research works have been performed regarding the architecture and algorithms that compress various type of IoT data. However, all the proposed works are based on different IoT environment and requirements. Some of them works discussed the compression of multimedia (audio, video, image etc) data; some other work involves string data and others relate numeric data. In addition to that, most of these research works provide efficiency considering different type of IoT data or environment.

Disadvantages

- All the proposed works are based on different IoT environment and requirements.
- Some of them works discussed the compression of multimedia (audio, video, image etc) data; some other work involves string data and others relate numeric data.
- most of these research works provide efficiency considering different type of IoT data or environment.

Proposed System

We proposed a novel lightweight approach capable of alleviating both aspects by leveraging on the advantages offered by classification methods to optimize communications and by enhancing information transmission to simplify data classification. In [9], the performance of the data compression schemes is compared among each other, showing the compression capabilities of each of them under different scenarios.

ADVANTAGES:

- We got an initial compression at the fog nodes by 50% compression ratio and in the Cloud storage we have compressed the data up to 90%.
- We also showed that the error is varied from the original data by 0% to 1.5% after decompression.

IMPLEMENTATION

MODULES:

- User
- Fog Node
- Cloud
- Admin

MODULE DESCRIPTION

- **Admin**

This admin module will help us to VIEW USERS, VIEW ALL FILES, VIEW SIZE IN CHART

- **Cloud**

Cloud has the following VIEW FILES TO COMPRESS, COMPRESSED FILES DETAILS

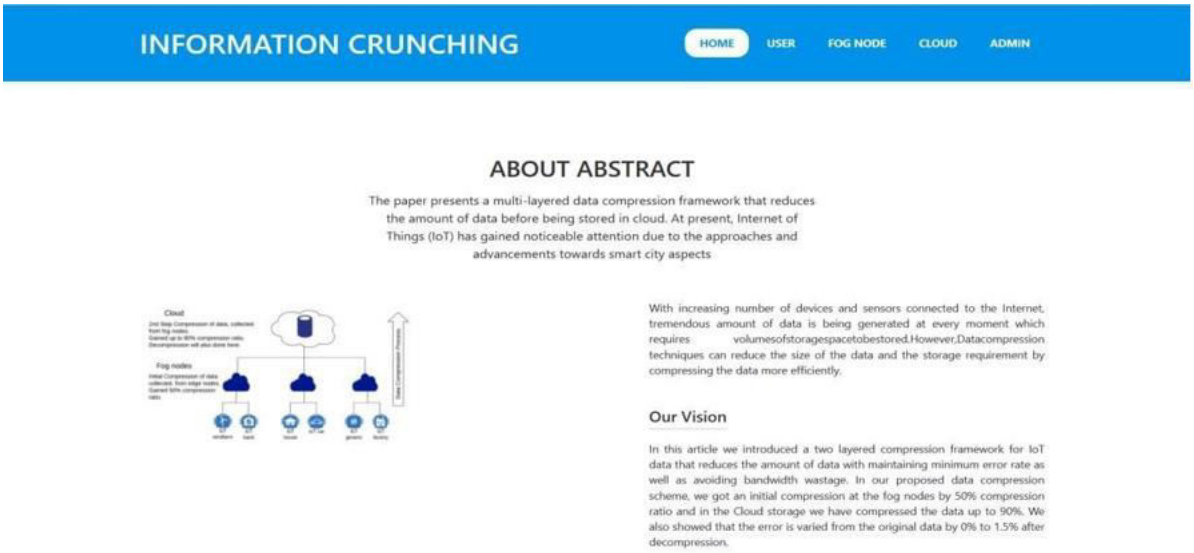
- **Fog Node**

Fog Node has the following operations VIEW FILES TO COMPRESS, COMPRESSED FILES DETAILS

- **User**

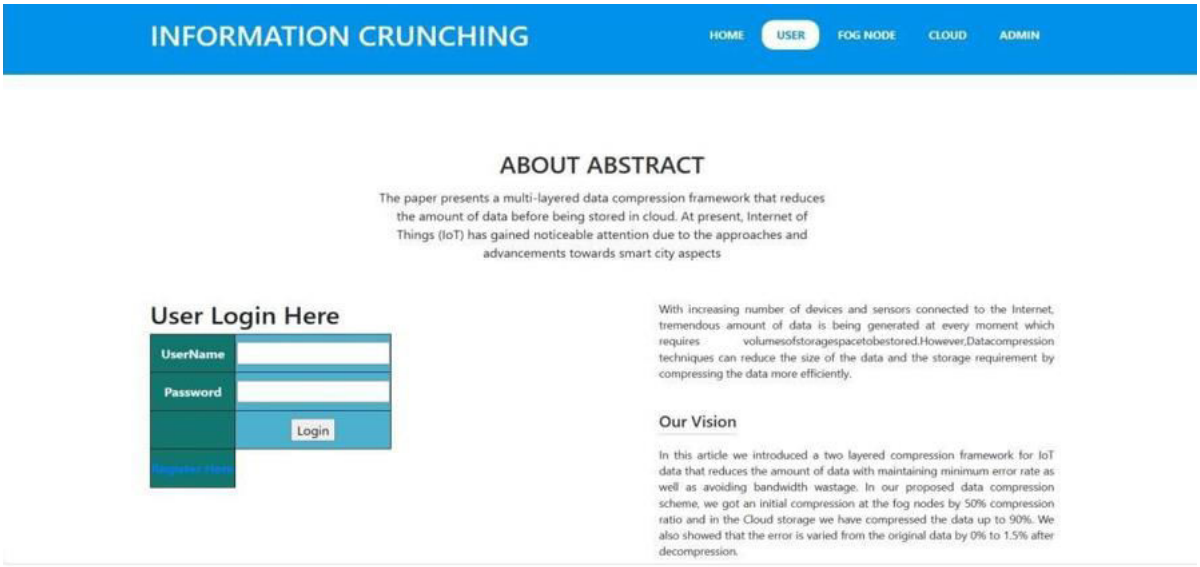
User operations are VIEW PROFILE, UPLOAD FILE, ALL FILES DETAILS, DECOMPRESS

RESULTS



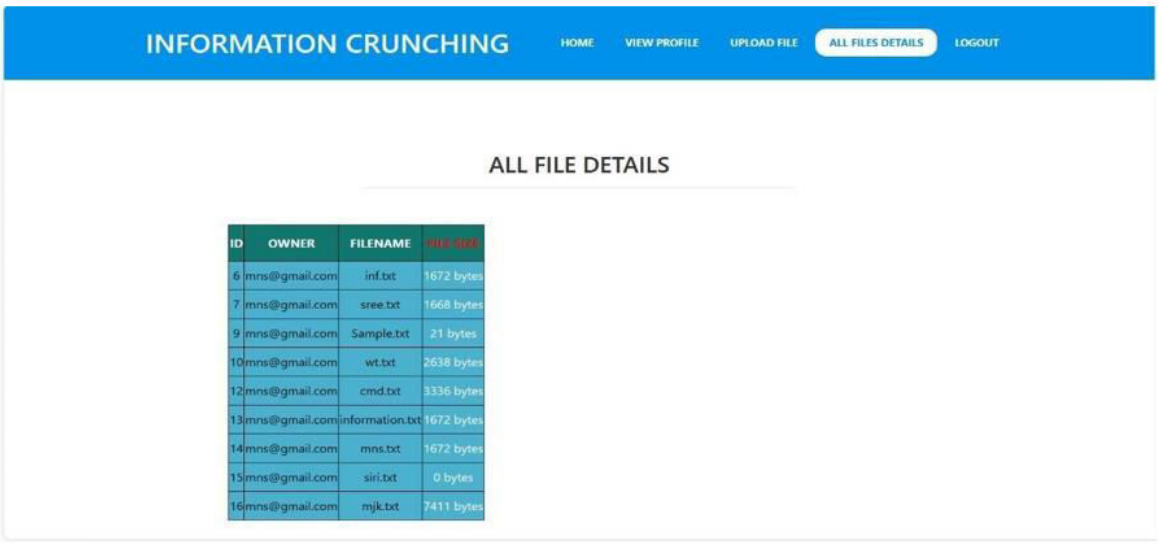
HOME SCREEN

REGISTRATION SCREEN



INFORAMTION CRUNCHING SCREEN

The term “All file details of user” refers to all details and information of multiple users.



ALL FILE DETAILS OF USER

CONCLUSION

Big data issue seems terrible with the increasing number of IoT devices. Present research works are less advanced compared to the need. Therefore, our proposed scheme compresses the IoT numerical data with a better compression ratio as well as lower error rate. Here, we used a lossy compression technique to mine the IoT data in cloud storage. With initial compression in Fog node, we succeed to reduce energy consumption and bandwidth wastage as well. We achieved on around 90% compression ratio with around 1% error rate that is minimum and indicates the efficiency of the process while compressing the homogeneous structured data created by IoT sensor networks where approximate values are needed for further mining. In this regard, a better storage optimization, less energy consumption and less bandwidth wastage can lead towards an efficient management of smart city.

FUTURE SCOPE

Safeguarding user information in contextual social networks is a critical concern given the increasing amount of personal data shared and the potential privacy risks associated with it. Here are some future-focused strategies and considerations for enhancing user information protection in contextual social networks:

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