AN ENHANCED CLOUD STORAGE METHOD: FOG COMPUTING

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Abstract
In this evolving era of digitization the use of big data, cloud computing for securing the data has become the traditional method of data storage. In this paper we have come up with a new technology named Fog computing which is used for security and protection issues mainly concentrating on fog processing.
Keywords: Fog computing, Cloud Computing, IoT;

I. INTRODUCTION

These days we find the use of cloud everywhere to store the bulk amount of data for business, organization and personal purpose. As cloud computing is day-by-day growing with its popularity and its attention in all walks of life , its offering huge number of services to the users . It is an ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources [1] .Hence this is the main reason behind the software companies for drifting towards this technology. Since there is increased number of users in this arena, the chance of data integrity, data security and confidentiality is at risk. Cloud computing isn't just the basic models we know earlier, but it is a combination of huge number of computing strategies, methodologies, concepts like Software Oriented Architecture ,virtualization and other which are based on internet. Virtualization is to form a virtual version, in both Fog and Cloud, using virtual resources .Even in this cloud, we have security mechanisms like identity, authentication, authorization, server roles, password policies, but they aren't enough for our security terms. Somehow our data security is comprised with the high decryption technologies or the hacking issues. This is how the idea of"Fog computing" came into Limelight. Fog computing popularly known as fogging and Edge Computing, is a model in which data, processing and the applications are mostly concentrated in End users or Devices i.e. at the network side(edge)rather than concentrating almost on the Cloud. Cloud computing can be a proficient contrasting option to owning and keeping up PC assets and applications for some associations, especially little and medium measured associations, because of the compensation as-you-go show and different attributes (e.g., on-request, self-benefit, asset pooling and fast flexibility). In fog figuring, cloud versatile assets are stretched out to the edge of the system, for example, compact gadgets, shrewd items, wireless sensors and other Internet of Things (IoT) gadgets to diminish inertness and system clog. IoT gadgets utilize interconnected advances like Radio Frequency Identify (RFID) and Wireless Sensor and Actor Networks (WSAN) to trade data over the Internet, and are more coordinated in our day by day life. [1].Smart cities ,Smart farming, Smart grid, keen city, brilliant matrix ,jet engines, flying drones, thwarting illegal fishing ,power grid etc. As IoT is the most innovative technology used these days for running home appliances ,embedded software systems ,sensors and many network based applications to communicate with data, using Fog computing would be an added advantage.

These IoT gadgets made our lives easy by constrained capacity, high productive capability, security and unwavering quality .Hence, its applications require geo-dispersion ,portability bolster ,location mindfulness and low inactivity to effectively gather and process information from IoT gadgets which are provided the

characteristics of Fog computing like Streamlining ,geo-identification, location mindfulness ,edge arrangement etc with versatility .Although Cloud and Fog almost share same highlights but Fog remained to be dominant thereby extending the features of Cloud computing.

II. LITERATURE REVIEW

As the majority of today's systems are mostly cloud centric, the basic characterization used with these system is " Device-to-Cloud" communication and Analysis is completely with the cloud(e.g. unless analysis on the cloud is made ,the information is not processed/retrieved).Fog computing or Fogging or Fog Networking is the word coined by the CISCO in January2014, which refers to extending the Cloud Computing to the edge of the company's network. It is an architecture which uses one or more end-user clients or near-user edge devices collaboration to function substantial storage amount. Fog figuring is the arena which renders cloud-like services to the network edge or the system edge. It uses the cloud along with the edge assets for its own foundation, as Figure 1 appears.

So the devices at the end users use the data, process it and hence gets retrieved back at the edge network itself. To have the clear idea about the edge devices and cloud network figure1 can be referred. Therefore instead of fetching the data from very far above the sky(i.e. here cloud is meant) the data is directly brought up to the clients using from the nearby devices on the ground(i.e. here fog devices are meant)

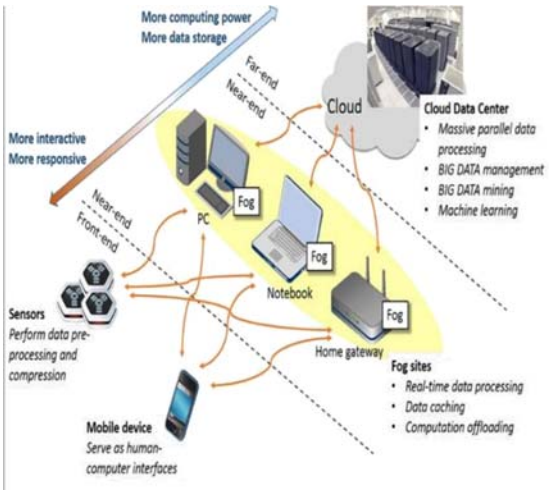

Figure 1: Fog Computing Architecture

Whatever the IoT information be, it is locally managed by edge gadgets or the customers/close clients to complete a significant measure of capacity, correspondence and services. It also under tabs client portability, asset and interface heterogeneity. Fog processing is suitable for the land conveyance of assets as opposed to have an incorporated one, that depicts us that " Fog registering is the augmentation of Cloud figuring". The difference found is that Fog gives closeness to its End clients by providing thick land appropriation and by underpinning versatility. The end gadgets used are the Access focuses or set-up boxes to enjoy the services of Fog. To know the hierarchy of this 3 tier system and representation , figure 2 can be sought

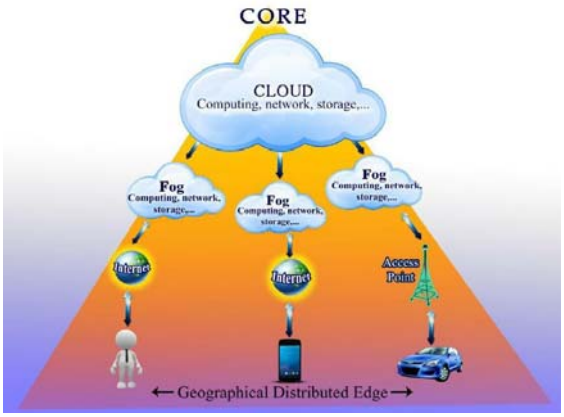

Figure 2: Hierarchy of network

III.EXISTING SYSTEM:

A THREATS IN CLOUD:

DATA BREACHES- security of the data is led to risk when any theft occurs during processing.

ACCOUNT OR SERVICE TRAFFIC HIJACKING- for instance,if the login are lost then the account is at risk. DATA LOSS- the data can be sometimes lost,if it is found to the intruder.

ACCOUNT OR SERVICE TRAFFIC HIJACKING- for instance , if the login are lost then the account is at risk. DENIAL OF SERVICE- sometimes the server is so overloaded that when many millions of people try accessing the same service and it could be caught hand by the hacker. INSECURE API's- API, otherwise called as Application Programming Interface controls most of the third party applications and verifies user ,this can be

sometimes hazardous if the third party is from unknown source. MALICIOUS INSIDERS- sometimes we don't have an idea when a second person passively attacks by knowing our credentials of login.

ABUSE OF CLOUD SERVICES- by trying all the services to unblock an account or database the attacker somehow breaksthe encryption in very less time.

SHARED TECHNOLOGY- knowing or unknowingly the firms get into Cloud then without their knowledge they would be in partner to some other web site.

CONNECTIVITY- an assumption is made that a device is always connected to the cloud.

OTHERS- connectivity cost, latency, bandwidth and delay jitter are also some cloud centric assumptions.

So the cloud computing system is a type of computing that depends on sharing resources of computing rather than using the local servers or any kind of personal/edge devices to handle applications .So there is an availability of some other companion to help Cloud to perform better even at the user end and this could be achieved by Fog in few ways.

IV.PROPOSED SYSTEM

In this paper we propose a distinct approach to secure data in Cloud which is done by Fogging.

Basic characteristics and key specifications of fog computing:

- Heterogeneity: This says that the Fog nodes can be deployed in a wide variety of environments .e.g. smart cars connected through IoT

- Interoperability: Fog components are interoperable in order to give wide range of services like Streaming etc.

- Real-time communication: It refers to the speedy service also e.g. constant movement observing frameworks, request continuous handling capacities as opposed to clump preparing.

- Geographical distribution: The services and applications objective of the fog is widely distributed.

- Mobility support: Provides mobility techniques like decouple host identity to location identity.

- Prevalence to wireless access : Wireless access focuses and cell versatile door are regular cases for fog organize node.

- Low latency and location awareness: Less delay in accessing data and edge location has low inertness.

- Large-scale sensor networks: This is relevant when checking nature utilizing few circulated frameworks that require suitable assets.

The clear representation of the requirements for cloud computing versus fog computing is as shown in the table below.

Table 1

Requirements	Cloud Computing	Fog Computing
Latency	High	Low
Delay Jitter	High	Very low
Location of Service	Within the Internet	At the edge of the local network
Distance between client and server	Multiple hops	One hope
Security	Undefined	Can be defined
Attack on data enroute	High probability	Very low probability
Location awareness	No	Yes
Geo-distribution	Centralized	Distributed
No. of server nodes	Few	Very large
Support for Mobility	Limited	Supported
Real time interactions	Supported	Supported
Type of last mile connectivity	Leased Line	Wireless

Table 1: FOG Vs CLOUD

Hence with the seamless integration of both the cloud and the fog services, we are ready to improve the involvement by disconnecting client information to live on the edge.

V.APPLICATIONS:

1. The most used application is extending cloud computing.
2. In the field of IoT, in various applications like Smart city, Smart grid, Digital city, keen city , Smart farming, Robotics(with IoT)etc.
3. Fog is user friendly and reliable
4. Enables real-time analytics
5. It is securable,dependable and adaptable
6. Though it enables third party's applications to access user's information, the data is sometimes perceivable to outsiders but still this can be overcome with the use of dependable protocols.

VI.CONCLUSION

In this paper we have proposed an advanced technique for securing data in cloud through fog computing. In this paper we have come up with fog computing and it gave an advancement to the existing methodologies of securing data in cloud.

VII.FUTURE SCOPE

In this paper we have worked with a new scope of fog computing in future we will come up with more advancement in this technology. No doubt that there is going to be a foggy future ahead.

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