Secure Data Sharing and Searching at the Edge of Cloud-Assisted Internet of Things

ABSTRACT

Over the last few years, smart devices are able to communicate with each other and with Internet/cloud from short to long range. As a consequence, a new paradigm is introduced called Internet of Things (IoT). However, by utilizing cloud computing, resource limited IoT smart devices can get various benefits like offload data storage and processing burden at cloud. To support latency sensitive, real-time data processing, mobility and high data rate IoT applications, working at the edge of the network offers more benefits than cloud. In this paper, we propose an efficient data sharing scheme that allows smart devices to securely share data with others at the edge of cloud-assisted IoT. In addition, we also propose a secure searching scheme to search desired data within own/shared data on storage. Finally, we analyze the performance based on processing time of our proposed scheme. The results demonstrate that our scheme has potential to be effectively used in IoT applications.

EXISTING SYSTEM

Over the last few years, smart devices are able to communicate with each other and with Internet/cloud from short to long range. As a consequence, a new paradigm is introduced called Internet of Things (IoT).The Internet of things (Iot)1 is considered as a future internet that extends the connection of the internet to all kinds of real-world physical smart devices. By connecting these billions of smart devices to the Internet, the IoT will provide developed smart and autonomous cyber-physical environments in the area of smart grids, smart cities, smart homes, smart medical and healthcare systems, wearable technologies, transportation systems, etc. However, the majority of these devices are part of a large platform, hence, a huge amount of data are generated that requires high computational capabilities for storage, processing, and analyzing purposes in a secure and efficient manner. Generally, the smart devices have limited

resources. On the other hand, cloud resources have virtually unlimited storage and processing capabilities with scalability and on-demand accessibility anywhere. Thus with the help of the cloud, the IoT smart devices can relieve the burden of limited resources.2 For IoT applications, smart devices require low latency, high data rate, fast data access, and real-time data analytics/processing with decision-making and mobility support.

DRAWBACKS

- Smart devices generally have limited resources.
- They have limited range of connectivity.

PROPOSED SYSTEM

In this paper, we propose a lightweight cryptographic scheme so that IoT smart devices can share data with others at the edge of cloud-assisted IoT wherein all security-oriented operations are offloaded to nearby edge servers. Furthermore, although initially we focus on data-sharing security, we also propose a data-searching scheme to search desired data/shared data by authorized users on storage where all data are in encrypted form. Finally, security and performance analysis shows that our proposed scheme is efficient and reduces the computation and communication overhead of all entities that are used in our scheme. First, we propose a secure data-sharing scheme at the edge of cloud connected IoT smart devices that utilizes both secret key encryption and public key encryption. In this scheme, all security operations are offloaded to nearby edge servers, thereby, greatly reducing the processing burden of smart devices. Next, we propose a searching scheme to search desired data securely by authorized users within encrypted, stored, shared data in edge/cloud without leaking keyword, secret key, and data, thereby reducing both computation and communication overhead during search and data retrieval. Then, we show the verification process of the shared data as well as data retrieval after searching. Hence, our proposed scheme attains the integrity of shared data and searching resultant data. Finally, we analyze the performance of our proposed scheme and prove that our scheme is efficient and can be used in IoT applications.

ADVANTAGES

- It allows smart devices to share data with lower latency and have fast data access and higher bandwidth.
- It reduces the processing burden of smart devices.

SYSTEM REQUIREMENTS

H/W System Configuration:-

- ➤ Processor   -   Pentium –IV
- ➤ RAM   -   4 GB (min)
- ➤ Hard Disk   -   20 GB
- ➤ Key Board   -   Standard Windows Keyboard
- ➤ Mouse   -   Two or Three Button Mouse
- ➤ Monitor   -   SVGA

S/W System Configuration:-

- ➤ Operating System   :   Windows 7 or 8 32 bit
- ➤ Application Server   :   Tomcat5.0/6.X
- ➤ Programming Language   : Java
- ➤ Java Version   : JDK 1.6 and above