Certain Investigations on Security Issues and Resolving Strategies in Cloud Computing

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ABSTRACT: This paper reviews methods developed for anonymizing data from 2011 to present. Publishing microdata such as census or patient data for extensive research and other purposes is an important problem area being focused by government agencies and other social associations. The traditional approach identified through literature survey reveals that the approach of eliminating uniquely identifying fields such as social security number from microdata, still results in disclosure of sensitive data, k-anonymization optimization algorithm ,seems to be promising and powerful in certain cases ,still carrying the restrictions that optimized k-anonymity are NP-hard, thereby leading to severe computational challenges. k-anonimity faces the problem of homogeneity attack and background knowledge attack . The notion of l-diversity proposed in the literature to address this issue also poses a number of constraints , as it proved to be inefficient to prevent attribute disclosure (skewness attack and similarity attack), l-diversity is difficult to achieve and may not provide sufficient privacy protection against sensitive attribute across equivalence class can substantially improve the privacy as against information disclosure limitation techniques such as sampling cell suppression rounding and data swapping and pertubertation. This paper aims to discuss efficient anonymization approach that requires partitioning of microdata equivalence classes and by minimizing closeness by kernel smoothing and determining ether move distances by controlling the distribution pattern of sensitive attribute in a microdata and also maintaining diversity.

KEYWORDS: Data Anonymization, Microdata, k-anonymity, Identity Disclosure, Attribute Disclosure, Diversity

I. INTRODUCTION

Need for publishing sensitive data to public has grown extravagantly during recent years. Though publishing demands its need there is a restriction that published social network data should not disclose private information of individuals. Hence protecting privacy of individuals and ensuring utility of social networor data as well becomes a challenging and interesting research topic. Considering a graphical model [35] where the vertex indicates a sensitive label algorithms could be developed to publish the non-tabular data without compromising privacy of individuals. Though the data is represented in graphical model after KDLD sequence generation [35] the data is susceptible to several attacks such as homogeneity attack, background knowledge attack, similarity attacks and many more. In this paper we have made an investigation on the attacks and possible solutions proposed in literature and efficiency of the same.

II. SECURITY THREATS IN CLOUD COMPUTING

Generally Cloud computing simply meant as Internet computing , generally the internet is seen as collection of clouds. Thus the word cloud computing can be defined as utilizing the internet to provide technology enabled services to the people and organizations. Cloud computing enables consumers to access resources online through the internet, from anywhere at any time without worrying about either technical or physical management and maintenance issues of the original resources.

Cloud computing is independent computing it is totally different from grid and utility computing. Google Apps is the paramount example of Cloud computing.

Cloud computing is cheaper than other computing models as because of zero maintenance cost is involved since the service provider is responsible for the availability of services and clients are free from maintenance and management problems of the resource machines. Due to this feature, cloud computing is also known as utility computing, or "IT on demand".

As per the authors the principal service models being deployed are of three types.They are SaaS,PaaS,IaaS. SaaS is abbreviated as   Software as a Service**.** In this model the Software's are provided as a service to the consumers according to their requirement, enables consumers to use the services that are hosted on the cloud server. PaaS is abbreviated as Platform as a Service**.** In this model the Clients are provided platforms access, which enables them to put their own customized software's and other applications on the clouds.

IaaS is abbreviated as Infrastructure as a Service**.** In this model the Rent processing, storage, network capacity, and other basic computing resources are granted, enables consumers to manage the operating systems, applications, storage, and network connectivity.

These authors did the literature review on security threats of cloud computing. As per the author Rongxing et, his paper gave a new security and provenance proposal for data forensics and post examination in cloud computing. According to them their proposed system is typified, the proposed system can provide the privacy and security on secret documents/files that are piled up in the cloud. It also provides secure authentication mechanism to control unauthorized user access, and provides track mechanism to resolves disputes of data. Their proposed secure provenance scheme is working on the bilinear pairing method and they have claimed it as the necessary building blocks of data forensics and post examination in cloud computing environment. Using provable security techniques, they have formally verified that there proposed scheme is safe and sound in the standard model.

According to the author La'Quata Sumter et al,the paper says The rise in the scope of cloud computing has brought fear about the Internet Security and the threat of security in cloud computing is continuously increasing. Consumers of the cloud computing services have serious concerns about the availability of their data when required. Users have server concern about the security and access mechanism in cloud computing environment. The advantage of their work is assurance of security to the end users of cloud. The limitation of this study is there proposed framework is not feasible for large scale cloud computing environments.

According to the author Mladen, the paper states that Cloud computing is a recent field, which came into existence after Years of research in networking and different types of computing. It uses a SOA, that minimized the information technology operating and maintenance cost for the clients, it offers greater flexibility, reduces capital costs, provides required services are along with many other characteristics. The benefit of this study is the identification of issues related with security and implementation. The drawback of this work is the study is based on theoretical concepts nothing practical found in this study.

According to the author Wayne,the paper states that benefits of cloud computing are highlighted along with the basic security issues that are still associated with cloud services. Shaping the security of critical systems is very important. Addressing the security issues faced by end users is extremely mandatory, Researchers and professionals must work on the security issues associated with cloud computing. The study gazes primary security and privacy
Problems. It mainly focuses public clouds that needs significant consideration and presents required facts and figures to make organizations data security decisions. Key security issues identified and addressed in this paper are end user trust, Insider Access, Visibility, Risk Management, Client-Side Protection, Server-Side Protection, Access Control and Identity management.

Cloud computing is not fully mature and still lot needs to be explored. After the authors current work they claimed that security is the most important threat to both the users and the vendors of cloud computing. Vendors, Researchers and IT security professionals are working on security issues associated with cloud computing. Different models and tools have been proposed but still nothing fruitful found. While doing research on security issues of cloud computing

the authors known that there are no security standards available for secure cloud computing. In their future work they quoted that they will work on security standards for secure cloud computing.

III. SECURITY IN CLOUD COMPUTING

Cloud computing paradigm that provide unlimited infrastructure to store or execute client's data or program. Cloud computing is a long dreamed vision of computing as a utility, where data owners can remotely store their data in the cloud to enjoy on- demand highly-quality application and services from a shared pool of configurable computing resources. Cloud computing is known as one of the big next things in information technology world.

It is a way of computing in which dynamically scalable and often virtualized resources are provide as a services over the internet. Internet is not only a communication medium but, because of the reliable, affordable and ubiquitous broadband access, is becoming a powerful computing platform rather than running software and managing data on the desktop computer or server, user are able to execute application and access data on demand from the cloud (internet) anywhere in the world.

The authors discussed about the types. For secure service in cloud computing there are two type of model. First is the delivery model and another is deployment model. Delivery model in cloud computing the authors define by the three keys that are infrastructure as a service (IaaS), Software as a service (SaaS), Platform as a service (Paas).Secondly Deployment model is discussed.

This deployment model contains three striking models such as public clouds, private clouds and hybrid clouds. The authors quoted that Gmail is the perfect example of Cloud Computing. The users doesn't need a software system or mail server to send or receive emails. The users just login to it, customize it and start using it. Unlike other traditional email management systems like MS Exchange, Gmail doesn't requires a software system, mail server, regular upgrades or dedicated team to manage it. Instead, everything is placed in the Cloud and the users get all the benefits that are provided 'as a service'.

Nextly, the authors specified the security issues. The Cloud computing technology comes with many issues such as performance, interoperability, data migration and transition from legacy systems. One of the main issues is security. The following security issues are highlight for the cloud computing vendors.They are Privileged access,Recovery,Long term viability, Data availability ,Data location .And the authors also discussed about Traditional security, Availability ,Third party data control.

The authors discussed the challenges of security. Cloud computing environment are multidomain environment in which each domain can use different security, privacy and trust requirement and potentially employ various mechanism, interface and semantics. They described some challenges in cloud computing. Cloud Migration/ Security ,Reliability, Availability, Monitoring Measures, Lack of Communication, Access control and accounting, Trust management and policy integration Privacy and data protection.

Hereby the authors concluded that Cloud computing is a new way of delivery computing delivering computing resources which introduce a lot of benefits to its user. Despite its positive characteristics, it also bring in new security worries such as a data security issue, illegal data access etc. In this paper the authors investigate the introduction about cloud and security problems in cloud computing and several schemes to secure data in cloud. To provide a more reliable security in cloud computing is the future research goal.

IV. CONCLUSION AND FUTURE WORK

Various methods developed for anonymizing data from 2011 to 2012 is discussed. Publishing microdata such as census or patient data for extensive research and other purposes is an important problem area being focused by government agencies and other social associations. The traditional approach identified through literature survey reveals

that the approach of eliminating uniquely identifying fields such as social security number from microdata, still results in disclosure of sensitive data, k-anonymization optimization algorithm ,seems to be promising and powerful in certain cases ,still carrying the restrictions that optimized k-anonymity are NP-hard, thereby leading to severe computational challenges. k-anonimity faces the problem of homogeneity attack and background knowledge attack . The notion of l-diversity proposed in the literature to address this issue also poses a number of constraints , as it proved to be inefficient to prevent attribute disclosure (skewness attack and similarity attack), l-diversity is difficult to achieve and may not provide sufficient privacy protection against sensitive attribute across equivalence class can substantially improve the privacy as against information disclosure limitation techniques such as sampling cell suppression rounding and data swapping and pertubertation. Evolution of Data Anonymization Techniques and Data Disclosure Prevention Techniques are discussed in detail. The application of Data Anonymization Techniques for several spectrum of data such as trajectory data are depicted. This survey would promote a lot of research directions in the area of database anonymization.

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