Configuring a Trusted Cloud Service Model for Smart City Exploration Using Hybrid Intelligence

Manash Sarkar, Birla Institute of Technology, Department of Computer Science and Engineering, Mesra, Ranchi, India
Soumya Banerjee, Birla Institute of Technology, Department of Computer Science and Engineering, Mesra, Ranchi, India
Youakim Badr, National Institute of Applied Sciences, Lyon, France
Arun Kumar Sangaiah, School of Computing Science and Engineering, VIT University, Vellore, India

ABSTRACT
Emerging research concerns about the authenticated cloud service with high performance of security and assuring trust for distributed clients in a smart city. Cloud services are deployed by the third-party or web-based service providers. Thus, security and trust would be considered for every layer of cloud architecture. The principle objective of cloud service providers is to deliver better services with assurance of trust about clients’ information. Cloud’s users recurrently face different security challenges about the use of sharable resources. It is really difficult for Cloud Service Provider for adapting varieties of security policies to sustain their enterprises’ goodwill. To make an optimistic decision that would be better suitable to provide a trusted cloud service for users’ in smart city. Statistical method known as Multivariate Normal Distribution is used to select different attributes of different security entities for developing the proposed model. Finally, fuzzy multi objective decision making and Bio-Inspired Bat algorithm are applied to achieve the objective.

KEYWORDS
Bat Algorithm, Cloud Service, Fuzzy Multi Objective Decision Making, Multivariate Normal Distribution, Smart City

INTRODUCTION
Smart city, a standard planed city, encompasses variety of network services for enterprise and individuals. The services are provided by different kind of domain specific vendors, which lead to limited scalability and extensibility. Recently, smart-city services are typically provided in single domains like Internet service, building management, transportation, and health care. Recent trend of service provider is to provide service based on on-demand process. The concept of cloud computing is implemented for using virtualized on-demand network services. Therefore, cloud computing becomes popular to internet users in context of smart city. Basically, cloud computing is applicable in different Government, public and private sectors. People, from last few years, downloaded different software to run applications or programs in their computer or server. People use online social networks to maintain their social community, avail different kinds of online banking transaction and also access variety of online application to make their video chatting for communication regularly through internet. Cloud computing provides same kinds of applications through internet based on clients’ demand. Therefore, cloud based services are ideal for not only business organizations but also beneficial for individuals

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in concept of smart city (Chourabi et al. 2012; Clohessy et al. 2014). Present era heartily welcomes the concept of cloud computing for trending the smart city. Therefore, security and privacy of cloud computing are crucial issues to maintain the trust in a smart city. The responsibility of CSP is to guarantee the people of smart city that their information is in safe (Ferraz et al. 2014; Solankia et al. 2016). In a smart city, CSP are responsible to ensure secured communication between authorized users’ and provides secured data exchange in multimedia system (Dey & Santhi 2017). Improvement of efficient and trusted on-demand services have been enhanced dramatically through proper utilization of centralized resources.

Therefore, the concept of trusted cloud computing has been introduced. It is mandatory to maintain trust between every entity within same context for building a trusted environment (Sarkar et al. 2015). In case of secured smart city, trust would be maintained between every user. The flexibility and cost effectiveness of cloud computing made an arena for servicing consumers’ and enterprises’ requirements. The popularity and flexibility of cloud computing sometime become threat for itself. Thus, security and privacy are crucial issues for cloud architecture (Ranabahu et al. 2009; NIST Special Publication 2011). The basic idea of security in cloud computing follows the context of cloud infrastructure (Ahmed & Hussain, 2014). The study of security, privacy and trust in cloud environment enhances the knowledge about different kind of threats and their countermeasures (Khalil et al. 2014). It is a responsibility for CSP to deploy different security issues according to cloud environment and varieties of cloud services. Security issues and risks of cloud environment were also discussed by Pingree (Khalil, 2010). The author described that the potential risks of all cloud system was enhanced by the issue of violation for virtualization software. To sustain the goodwill of third party service provider, different types of optimistic decision would be initiated. Different cloud service providers use different types of security policies for their business model. Microsoft offers cloud services such as Windows Azure, Business Productivity Online Standard Suite (BPOS) and Windows SkyDrive (Microsoft Azure, 2016). Amazon another company handles customer relations based on their feedback. EC2 (Amazon Elastic Compute Cloud) (Amazon web services, 2016) is a simple web based service interface allows clients to obtain and configure capacity with minimal friction. Amazon web service (AWS) provides storage, database, broad set of global compute, analytics, application and deployment services for business and public organizations to move faster, less IT costs.

These services are secured and trusted by the largest enterprise itself. Google also maintains some security policies for sustain trust and goodwill of their business organization. Google provides Information Security Team to surveillance the Data Centre Physically (Google Cloud Platform, 2016). They also maintain Server and Software Stack Security, Data Access and Data Disposal regularly. Cloud would have the potential to aggregate the customers’ information in centralized data centre. Cloud service providers would assure the subscriber that service providers have ability to keep customers’ data protection and isolated. Transparency and assurance about the performance of the cloud service are necessary for subscribers. Every day cloud service faces different kind of challenges from different part of cloud architecture. Threats may arise from either internal or external of the environment. Different kind of malicious activities would be explored with in a network environment to hinder the executable system. Different techniques are available to trace the malicious clients. Sarkar et al. (2012).in their paper, proposed an intelligent technique to detect the malicious domain. The authors applied a meta-heuristics based searching support algorithm called cuckoo search to achieve the goal. The security of cloud computing would be robust and consistent for maintaining the flexibility and trust among the users. Different kind of security issues were described by Ahmed et al. (2014). They primarily reviewed various issues related to security and privacy intrinsic within the context of cloud environment. In this paper, we focus on the basic problem arises at the time of decision for selecting the security policies by the cloud service providers. Security threats in cloud computing recurrently change their nature and attack point over the time. Therefore, it becomes very difficult for the service providers to understand, which security policies will be appropriately suitable for the specific cloud environment. To overcome this problem, we proposed an intelligent decision

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