

Customer Satisfaction Model in Cloud Computing Environment

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ABSTRACT- Service level agreements are widely accepted mechanism for gaining enterprise-level information technology (IT) resources. The IT infrastructure provided by the Cloud provider must meet SLA established with the customer. SLA is generally used mechanism to determine contracts accessing requirements in business content. It defines a set of non-operating requirements of the service and also, incorporates penalties for unsatisfied requirements. The numbers of cloud customers are increasing day-by-day resulting in the increased loads on cloud service providers, thus, making Service Level Agreement (SLA) a prime need of time for ensuring the service quality. This helps in meeting the challenges presented by enterprise-oriented application software's towards traditional sales models. This paper is an attempt to devise a mathematical model for better handling of cloud's resources and increasing the satisfaction level of cloud customers by meeting SLA constraints.

KEYWORDS- Cloud computing, Service Level Agreement (SLA), Quality of Service (QoS), SLA Management.

1. INTRODUCTION

A service-level agreement is a negotiated agreement between two parties, one is service provider and other is customer where both providers and customer have to comply with the specified constraints. SLA can be a legally binding formal "contract" [9]. On the basis of negotiation process, contracts are set either statically or dynamically. The IT infrastructure provided by the Cloud provider must meet SLA established with the customer. SLA is generally used mechanism to determine contracts accessing requirements in business content. It defines a set of non-operating requirements of the service and also, incorporates penalties for unsatisfied requirements [2].

The SLA may include guarantee on providing compute power, storage space, network bandwidth, service availability and security, etc. In order to meet the customer SLA the infrastructure providers often end up over provisioning their resources. Hence the SLA should describe:

- The List of services provided by the service provider with the explanation of each service.

- A system of measurement to quantify the services delivered by the provider as declared and a system of auditing to manage the services.
- Liability of the provider and the customer.
- If the SLA is violated either by provider or customer then it describes the solution/cure for it.
- During the course of time, it states the narration about the changes that may happen in SLA.
- Major Service Level Agreement parameters, metrics, the measurable & un-measurable qualities, SLA components and the main information it should include are also mentioned along with the major Service Level Agreement (SLA) categories.

The process of establishing an SLA between the cloud service provider and the customer should result in the creation of an agreement that states the obligations and essential requirements of all the actors involved in it. The major drawback of present cloud system is that it only exhibits the obligations of the provider without considering all the requirements of a customer. Thus, it becomes a necessity to form an agreement allowing customer for maintaining a control over data and information present in Cloud [12].

2. LITERATURE SURVEY

Aljounmah *et al.* [2] have provided a description of the SLA and its importance in the field of Cloud computing. Authors are of the opinion that the dynamic nature of cloud calls for a continuous controlling and monitoring of QoS parameters for the successful implementation of SLA. With the increase in workload from customers, establishing SLA between provider and customer has become important task for guaranteeing the quality of service (QoS). According to authors, SLA is a description of the agreed service parameters, service quality and level of service guarantee, arrangements and remedies for all the cases of SLA violations. Explaining the basic concepts of SLA, authors have explored its significance from the perspective of both, service provider and customers.

In the study of Sahal *et al.* [11], authors have conducted a survey of existing research in the field of SLA management and have described SLA management approaches to avoid SLA violation and penalty cost arising as a result of such violations. According to them, quality parameters of any

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