Towards Finding Unreliability in Cloud Systems: Real Facts and Calculations

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Abstract- XaaS is a potentially game-changing technology that could reshape IT. In cloud computing every cloud is different, offering different services, different SLA, different charging models etc. Situation is difficult when if one can require real reliability, it should write more reliable applications. In IT field reliability of cloud computing has currently been an emerging topic. This is attractive to enterprises for business continuity and disaster recovery reasons. User expectations and demand are the major concerns in the design of a system. If the service provider cannot provide the QoS according to the demand of a user, the user can reject their service and will go to another service provider. Performance requirements of Cloud applications and services must be well planned to utilize from the cloud. In a true market-based economy, an application designer is able to select the provider of the goods he/she needs based on a combination of SMI related to cost, quality and so on. This means that a designer should be able to compare and rank the cloud services and select one of the most profitable (according to some user defined measures and user based experience). The key consideration like reliability for ranking cloud services will be highlighted throughout this paper, in addition to strategies for designing cloud applications. Consideration of reliability is critical since they affect the flow of data throughout the cloud, control of failover, trust over the services and user experience.

Keywords – XaaS, SLA, Reliability, SMI, Cloud Applications, Ranking Cloud Services

I. INTRODUCTION

In [1] service reliability presented as a major concern .The main characteristic of service reliability is that the ability of a system to provide acceptable/correct/accurate service delivered within an acceptable time. Classification of nonsuccessful requests into service failures (attributable to the service provider) and request failures (attributable to the user or user equipment) can utilizes return codes which are provided by some application protocols like SIP and so on. Most organizations still depend on internal infrastructures because they are not convinced that cloud computing is ready for prime time. QoS depends on software vendors who develop the service and service providers who host it. Prior enterprise adopters used utility computing basically for non-mission-critical requirements, but that is quickly changing as trust and reliability issues are resolved. Reliability is often enhanced in cloud computing environments because service providers utilize multiple redundant sites.

The remainder of the paper is organized as follows. Section II, gives a closer look of reliability as a cloud service perspective. Section III present case study of some faults in IaaS/PaaS service provider. Section IV highlighted a calculation scenario of cloud service reliability.

II. RELIABILITY: A CLOUD SERVICE PERSPECTIVE

"Reliability" is defined as "the ability of an item to perform a required function under stated conditions for a stated time period [2]". Presently, there are some researches which focus on reliability of cloud applications. [3] Discusses issues related with designing of reliable cloud applications. Many frameworks and models [4] are exploring approaches to support in the direction of reliability improvement. A case study is present in this paper, so the major problem for cloud computing providers is how to minimize such kind of outage/failover to provide reliable services. When Reliability defines in terms of cloud services, Application designers should attain to maximization and minimization of some factors showing through the Figure 1. There are two ways which can be employed to improve availability (i) improving reliability by MTBF $\longrightarrow\infty$ (ii) decreasing downtime by MTTR$\longrightarrow\infty$.

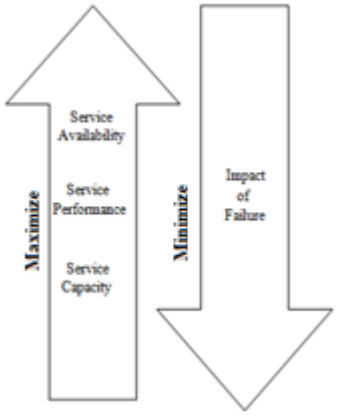

Figure 1. Maximization/Minimization of Factors

III. A CASE STUDY: UNRELIABLE SITUATIONS IN CLOUD SERVICES

Number of websites struggles with unexpected down-time and hundreds of networks discontinuity or have other issues every year. A Transient fault attributable to network connection between data center and customer causes drop in database connection in SQL Azure [5].Rackspace counted number of network faults in their services [6]. AWS EC2 only assures the availability of the whole cloud, but not of single instances [7]. Network Fault presented in AWS when failure EBS drives resulted down some of the hosted applications and websites for 24-72 hours [8].

IV. RELIABILITY CALCULATIONS

Reliability Calculation have received much more attention than Other QoS attributes like response time, throughput, availability, and security. In grid system request for resource can't be serviced immediately but in cloud computing requests for resources must be immediately fulfilled, or denied due to a lack of available resources. It is very important that for high reliability there must be some balance between cloud system reliability and probability of blocking new requests.CSPs always required reasonable number of resources provisioned to their customers between some oversubscription and undersubscription conditions (Showing by * in figure-2) because the conditions mentioned in figure-2 (by × and #) are undesirable and rarely observed. By work load, we refer to load due to incoming jobs and their corresponding tasks submitted by users. P_{bnr} calculated by Erlang loss station model [9, 10, 11].

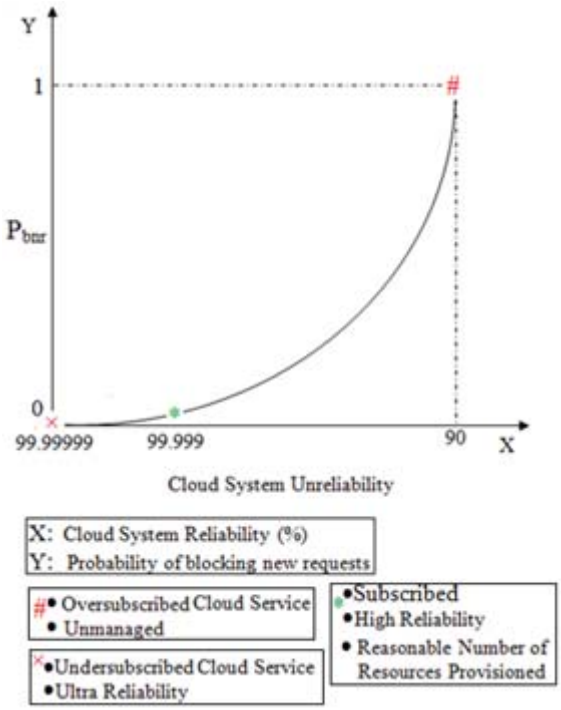

Figure 2. Observing Unreliability in Cloud Services

V.CONCLUSION

The paper presents factors assure the level of reliability demanded by users. The challenge for application designer is to meet the requirements of cloud applications for reliability. The cloud provider is to maximize the QoS values while minimizing the cost. The IaaS users purpose to obtain the optimized QoS to accomplish their jobs with a limited budget and deadline. The PaaS providers also guarantee meeting QoS requirements for the Application designers and Customers. The work present in this paper is completely based on reliability issues and its measurement from the point of application designer not the client. Measurement of reliability is a critical to obtain in cloud system because every cloud is novel and one can find difficulty and complexity to identified common standards, so analytical approaches may be useful for the same.

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