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Achieving Quality of Service using Ranking in Cloud

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Abstract

Cloud computing is a collection of application or program runs on a connected server. Most of organization like Amazon, Microsoft, Google, and IBM widely uses cloud computing domain. These organizations has highly provides cloud services to their customer. In cloud services, there is lot of difficulty to choose best services. In existing there are no methods to provide the Quality of Services (QoS) for ranking processes. In this proposed system, we have implemented the framework for provides QoS among the cloud services. Here, the framework mainly focuses to provide the service Level Agreement (SLA). Finally the proposed system achieves the QoS and also the user needs.

I Introduction

Cloud computing has emerged as a paradigm to deliver on demand resources (e.g., infrastructure, platform, software, etc.) to customers similar to other utilities (e.g., water, electricity and gas). The three main services are provided by the Cloud computing architecture according to the needs of IT customers. Firstly, Software as a Service (SaaS) provides access to complete applications as a service, such as Customer Relationship Management (CRM). Secondly, Platform as a Service (PaaS) provides a platform for developing other applications on top of it, such as the Google App Engine (GAE) . Finally, Infrastructure as a Service (IaaS) provides an environment for deploying, running and managing virtual machines and storage. Technically, IaaS offers incremental scalability (scale up and down) of computing resources and on-demand storage. Traditionally, small and medium enterprises (SMEs) had to make high capital investment upfront for procuring IT infrastructure, skilled

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developers and system administrators, which results in a high cost of ownership. Cloud computing aims to deliver a network of virtual services so that users can access them from anywhere in the world on subscription at competitive costs depending on their Quality of Service (QoS) requirements. Therefore, SMEs have no longer to invest large capital outlays in hardware to deploy their service or human expense to operate it. In other words, Cloud computing offers significant benefits to these businesses and communities by freeing them from the low- level task of setting up IT infrastructure and thus enabling more focus on innovation and creating business value for their services.

Due to such business benefits offered by Cloud computing, many organizations have started building applications on the Cloud infrastructure and making their businesses agile by using flexible and elastic Cloud services. But moving applications and/or data into the Cloud is not straightforward. Numerous challenges exist to leverage the full potential that Cloud computing

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promises. These challenges are often related to the fact that existing applications have specific requirements and characteristics that need to be met by Cloud providers.

Other than that, with the growth of public Cloud offerings, for Cloud customers it has become increasingly difficult to decide which provider can fulfill their QoS requirements. Each Cloud provider offers similar services at different prices and performance levels with different sets of features. While one provider might be cheap for storage services, they may be expensive for computation. For example, Amazon EC2 offers IaaS services of the same computing capabilities at different pricing for different regions. Therefore, given the diversity of Cloud service offerings, an important challenge for customers is to discover who providers in an objective way such that the required quality, reliability and security of an application can be ensured. Therefore, it is not sufficient to just discover multiple Cloud services but it is also important to evaluate which is the most suitable Cloud service. In this context, the Cloud Service Measurement Index Consortium (CSMIC) has identified metrics that are combined in the form of the Service Measurement Index (SMI), offering comparative evaluation of Cloud services. These measurement indices can be used by customers to compare different Cloud services. In this paper, based on these identified characteristics of Cloud services, We are taking the state of the art one step further by proposing a framework (SMICloud) that can compare different Cloud providers based on user requirements. The SMICloud would let users compare different Cloud offerings, according to their priorities and along several dimensions, and select whatever is appropriate to their needs. Several challenges are tackled in realizing a model for evaluating QoS and ranking Cloud providers. The first is how to measure various SMI attributes of a Cloud service. Many of these attribute vary over time. For example, Virtual Machine (VM) performance has been found to vastly vary from the promised values in the Service Level Agreement (SLA) by Amazon. However, without having precise measurement models for each attribute, it is not possible to compare different Cloud services or even discover them. Therefore, SMI Cloud uses historical measurements and combines them with promised values to find out the actual value of an attribute.

II Service Measurement Index in Cloud

It is a set of business key elements and its performances that provides measures and techniques in cloud.

2.1 Accountability

Attribute	SMI Attribute Definition
Auditability	The ability of a client to verify that the cloud service provider is adhering to the standards, processes, and policies that they follow.
Compliance	Standards, processes, and policies committed to by the cloud service provider are followed.
Contracting experience	Indicators of client effort and satisfaction with the process of entering into the agreements required to use a service.
Ease of doing business	Client satisfaction with the ability to do business with a cloud service provider.
Governance	The processes used by the cloud service provider to manage client expectations, issues and service performance.

2.2 Agility

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Attribute	SMI Attribute Definition
Adaptability	The ability of the cloud service provider to adjust to changes in client requirements.
Elasticity	The ability of a cloud service provider to adjust its resource consumpti service at a rapid enough rate to meet client demand.
Extensibility	The ability to add new features or services to existing services.
Flexibility	The ability to add or remove predefined features from a service.
Portability	The ability of a client to easily move a service from one cloud service another with minimal disruption.
Scalability	The ability of a cloud service provider to increase or decrease the amo service available to meet client requirements and agreed SLAs.

2.3 Assurance

Attribute	SMI Attribute Definition
Availability	The appropriateness of the service availability window, as well as the likelihood that the availability window will actually be provided to clients.
Maintainability	Maintainability refers to the ability for the cloud service provider to make modifications to the service to keep the service in a condition of good repair.
Recoverability	Recoverability is the degree to which a service is able to quickly resume a normal state of operation after an unplanned disruption.
Reliability	Reliability reflects measures of how a service operates without failure under given conditions during a given time period.
Resiliency/Fault Tolerance	The ability of a service to continue to operate properly in the event of a failure in one or more of its components.
Service stability	The degree to which the service is resistant to change, deterioration, or displacement.

2.4 Performance

Attribute	SMI Attribute Definition
Accuracy	The extent to which a service adheres to its requirements.
Functionality	The specific features provided by a service.
Suitability	How closely the capabilities of the proposed service match the features needed by the client.
Interoperability	The ability of a service to easily interact with other services (from the same cloud service provider and from other cloud service providers).

2.5 Security and Privacy

Attribute	SMI Attribute Definition
Access Control & Privilege Management	Policies and processes in use by the cloud service provider to ensure that only the personnel granted appropriate privileges can make use of or modify data/work products.
Data Geographic/Political	The client's constraints on service location based on geographic or political risk.
Data Integrity	Keeping the data that is created, used, and stored in its correct form so that clients may be confident that it is accurate and valid.
Data Privacy & Data Loss	Client restrictions on use and sharing of client data are enforced by the cloud service provider. Any failures of these protections are promptly detected and reported to the client.
Physical & Environmental Security	Policies and processes in use by the cloud service provider to protect the provider facilities from unauthorized physical access, damage or interference.
Proactive Threat & Vulnerability Management	Mechanisms in place to ensure that the service is protected against know recurring threats as well as new evolving vulnerabilities.
Retention/Disposition	The cloud service provider's data retention and disposition processes meet the clients' requirements.

2.6 Usability

Attribute	SMI Attribute Definition
Accessibility	The degree to which a service is operable by users with disabilities.
Client Personnel Requirements	The minimum number of personnel satisfying roles, skills, experience, education, and certification required of the client to effectively utilize a service.
Installability	Installability characterizes the time and effort required to get a service ready for delivery (where applicable).
Learnability	The effort required of users to learn to use the service.
Operability	The ability of a service to be easily operated by users.
Transparency	The extent to which users are able to determine when changes in a feature or component of the service occur and whether these changes impact usability.
Understandability	The ease with which users can understand the capabilities and operation of the service.

III Cloud SMI Architecture

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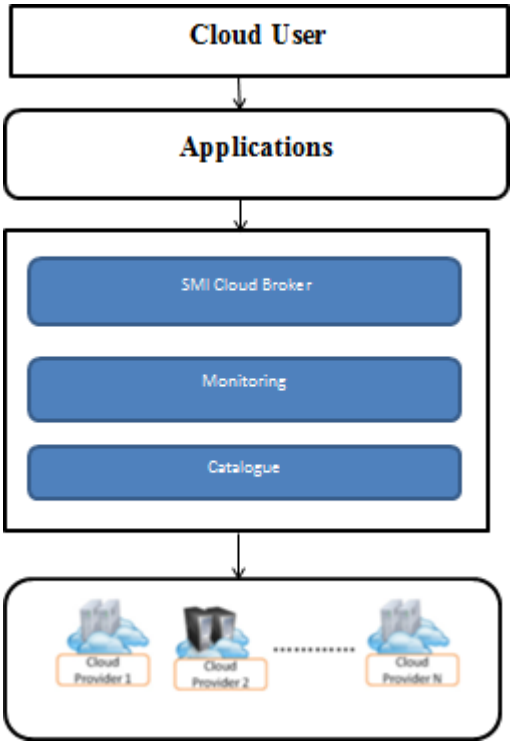
SMI Cloud Broker: this component is responsible for interaction with customers and understanding their application needs. It collects all their requirements and performs discovery and ranking of suitable services using other components such as the SMI Calculator and Ranking systems. SLA Management is the component that keeps track of customers' SLAs with Cloud providers and their fulfillment history. The Ranking System ranks the services selected by the Cloud Broker which are appropriate for user needs. The SMI Calculator computes the various KPIs which are used by the ranking system for prioritizing Cloud services. Monitoring: this component first discovers Cloud services that can satisfy users' essential QoS requirements. Then, it monitors the performance of the Cloud services, for example for IaaS it monitors the speed of VMs, memory, scaling latency, storage performance, network latency and available bandwidth. It also keeps track of how SLA requirements of previous customers are being satisfied by the Cloud provider. For this layer, many tools are available, some of which we discuss in the related work section. Service Catalogue: stores the services and their features advertised by various Cloud providers.



IV Conclusion

From thisAchieving QoS using Ranking in Cloud have been implemented and described. Cloud computing is a collection of application or program runs on a connected server. Most of organization like Amazon, Microsoft, Google, and IBM widely uses cloud computing domain. These organizations has highly provides cloud services to their customer. In cloud services, there is lot of difficulty to choose best services. In existing there are no methods to provide the Quality of Services (QoS) for ranking processes. In this proposed system, we have implemented the framework for

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provides QoS among the cloud services. Here, the framework mainly focuses to provide the service Level Agreement (SLA). Finally the proposed system achieves the QoS and also the user needs. In future, the proposed work enhances the QoS in various dimensions.

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