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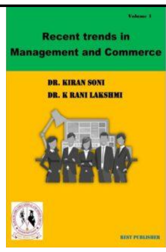

A Study on Cloud Service Selection Using Weighted Sum Model

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Abstract

Cloud service selection is essential in selecting on-demand services on a subscription basis. Since there are many cloud services with comparable functionality, it is important to find out which one best meets the needs and goals of the customer. A cloud service is perfect for the customer choosing a cloud service can be complicated Because of this, decision-making becomes a problem Services performance and cost are fundamentally different. In addition, many characteristics of cloud services there are these entire providers into account when selecting should be taken. When there are Many criteria, a compromise to be done, because in most real-world situations, which A service and other on all criteria Does not perform better than everyone else.However, a service of certain criteria may be fundamentally more advanced, other when judged by other criteria Solutions can be better than that. Action research is multifaceted Criteria that make decisions. A subfield called Contains; it is multi-criteria Focus on problem solving methods pays. Multiple criteria there are many techniques for decision-making. QoS based service in the cloud Several MCDM techniques to choose from although published, very useful the choice of technique is still remains debatable.

Keywords: Cloud computing, Cloud service selection, Weighted Sum Model.

Introduction

Recently, cloud computing is a new computer Great popularity as an example and It has gained significant importance. In line with this trend, public cloud services a large number are available. Cloud Services and their specifications, performance, pricing structures and based on various characteristics Different from each other, service Users meet their performance needs Fulfilment service and vendor makes it hard to choose. Financial constraints. [1].Application of distributed computing the rapidity of cloud computing Accelerates expansion. Three main ones Service Model Areas—Software an Infrastructure as a Service (SaaS), an as a Service (IaaS), and Platform as a Service (PaaS)—for customer requests by cloud computing accordingly is provided. Quality of Service (QoS) by standards, cloud computing is common Global services to customers Virtual enables access on a subscription basis aims to providing a network of services [2]. Of cloud computing technology Application (CCT) is a popular research, part of this technology is information Infrastructure of technology (IT) departments and online for utility services the next generation of subscription-based Provides access anywhere. Nowadays, many technologies Based services are not installed or not running on local machines. Instead, they are on remote servers are running, or "cloud and the results are premium for its users Available as a service. [3]. Cloud on demand service providers In a cloud environment that provides services Customers pay for services are paying Cost of cloud services Often in a Service Level Agreement (SLA). Specified and amount of service and determined by quality (SLA). Performance to meet SLA If not provided, to customers Cloud service for reimbursement Provider is responsible. [4]. Businesses are more into a technology this is because they are investing in scale Many including economies of scale There are advantages. As a result, this Cloud services that provide services and the number of CSPs is expanding. google, Big ones like Microsoft and Amazon IT companies to their clients will better meet their needs To provide reliable and affordable services They are competing with each other. Because of this healthy competition, CC Technology is evolving and so is IT Organizations improve their Quality of Service (QoS) are improving.[5].

Cloud computing

With virtualization, these resources can be quickly made available and deployed with little administrative work. The concept of how to acquire and provide computing resources with scalability and efficiency has changed because of cloud computing. [6]. Web Services and Cloud Services are closely related. SaaS Services primarily web-based Applications, whereas web Platform services to create services are provided and generally online are accessed through interfaces. Infrastructure services provide virtual environments. [7]. One called "cloud computing" Technique, scalable, reliable and for secure computer resources Fast, pervasive and on-demand Web-based access Enables. Minor administrative work or With Cloud Service Providers (CSPs) if contacted, these computer resources quickly deployed[8]. Traditionally, cloud computing the paradigm is three tiers of services contains online software Applications are now on demand to provide Software as a Service (SaaS). Can For example, a drive, Office 365 and Google Apps. A Platform as a Service (PaaS) programming language Environment for processing and applications Also provides APIs for creating Google App Engine and Microsoft Azure Two notable examples. A Hardware as a service is infrastructure a topic covered as a service (IaaS). Engine and leads are Amazon Web Services, Google Compute. [9]. SOC (Service Oriented Computing) and SOA (Service Oriented Architecture) The advent of technologies More on the development of web applications Pays attention. Standardized Interfaces and communication by using protocols, the web Services are loosely coupled and from the machine across the network the machine will be comfortable to communicate with Self-explanatory software may be considered components. [10]. Identifying and selecting hosted web services is becoming a more challenging task because of their exponential growth in size. In fact, many services with related functions can be taken into account when responding to customer requests. To solve this problem, better services are also promoted by considering QoS (Quality of Service) criteria that describe the non-functional aspects of Internet services. [11]. We can imagine mobile cloud computing because of the recent excitement around cloud computing and the emergence of smart mobile gadgets (MCC).. The cloud service provider provides these resources as services and makes them available to the client (CSP). [12].

Cloud service selection

The rapidity of cloud computing Development is depends on software and how applications are distributed and quickly that is maintained changes. Transferring information objects It also affects hardware makers, because with the Internet for users only simple devices to connect May be required and remote Unlimited powerful from servers Access resources and services. Mobile is a ubiquitous computing big problem and an opportunity. [13]. of many technical and financial factors basically, there are many cloud services divided into categories. There are Two types of clouds: public and Unique and first class service Based on access. Private Ownership system of clouds and its Only accessible by affiliates, Whereas wider access to public clouds has The second classification is cloud Based on the type of service provided Consists of and hardware as a service (HaaS), Platform as a Service (PaaS), Software as a Service (SaaS) and a Includes Infrastructure as a Service (IaaS). [14]. A growing number of cloud providers Number and variety Services at various price plans Providing, service quality and price Basically comparing cloud providers It is becoming difficult. It is a cloud service choosing a provider can be quite challenging. [15].A key enabler of cloud computing One of the technologies is virtualization, The idea of virtual machine migration Made possible, it's the cloud computing Its adaptability to gives A running app Another virtual from a virtual machine Move seamlessly to the engine, Thanks to virtual machine migration which Can be provided by an IaaS provider [16].Since the inception of service computing, IT Software services for decision makers Confused about how to choose they are struggling. of the candidate for examination Delegation of decision-making skills and the needs of the decision maker and Representation of preferences Typically service selection is structured Foundations (eg a person, organization, or automated agent)Of the decision maker A candidate who meets the requirements Two to choose from Representations are also compared. [17].the unique qualities of cloud computing environments create many intriguing concerns that must be answered before choosing a cloud provider. First, although it may seem similar to web services, cloud services are actually very different from them. For example, characteristics of cloud providers are not standardized. Additionally, the type and content of service level agreements (SLAs) often vary from cloud provider to provider. [18].Cloud providers provide high-quality services Different service models to ensure delivery (IaaS, PaaS, SaaS or other cloud services) to be used. Provide functionally similar services Consumers while competing with peers It's about meeting expectations Purpose Service performance (availability, reliability and response time), business and economics (pricing, usability and reputation), trust and security are quality of service Here are some examples of the many computer factors that make up[19].Cloud in use now Modes of Selection for Services Independent Service Evaluation criteria are using in practice, multiple relationships between criteria there are Efficiency of service selection system In several ways by these interactions Affected. Additionally, service selection measuring to check the effectiveness of the methods Absence of codes, in service selection field Impeding progress of decision-making procedures.[20]. In addition, benchmark testing of cloud service performance in performing cryptographic calculations may need to be tailored to the organization's needs. Because of all the above concerns, the company may have great difficulties in choosing a cloud service. [21].

Weighted Sum Model

Many competing objectives must be taken into account in many real-world optimization problems. The decision maker (DM) is concerned with effective solutions in this situation, which cannot be simultaneously optimized across all criteria. A non-dominated point is a representation of an effective solution within the objective space. [22].Multidimensionality implies that each criterion has a unique unit. Other approaches can be used to solve a one-dimensional problem than WSM. However, they are designed and developed to solve a multidimensional problem, which makes the WSM technique a unique approach to solving a one-dimensional problem. [23].WSM is one of the most well-known MCDM (multi-criteria decision-making) techniques and is the most straightforward way to evaluate alternatives based on a set of criteria. WSM is valid only if all the data supplied are of the same dimension or unit. [24]. WSM is one of the two major approaches closely linked to this study. A weighted linear summation or scoring approach is called WSM. For consistency, we refer to both WSM and SAW as WSM in this article. WSM is a linear combination function representing the preferences of the DM. The alternative with the highest score that meets all measurement criteria on the same dimension is the best choice. [25].The WSM approach is used to determine the value of an alternative energy while considering several factors. This approach is one of many used to solve MCDM problems. WSM is the relative weight of the criterion and the need for calculation of alternative performance values [26]. The four QoS metrics we considered were response time, throughput, reliability, and portability.

Response time: The response time of a cloud service demonstrates its overall performance very succinctly. This demonstrates how quickly a cloud service can be deployed. Hence, the time between submitting a request message and receiving a response message is referred to as response time. Provisioning and startup of the software application is part of the SaaS response time.It also shows how long it took to respond to the request message. In PaaS, this refers to provisioning, platform event initialization processes, and the time required to deliver the desired message. For example, in IaaS, if a customer requests a virtual machine (VM) from a cloud service provider, the response time shows how long the provider overall took to fulfill the request. This is a poor standard.

Throughput: The quantity of jobs finished by the cloud service in a specific length of time is indicated by the throughput. The throughput of a system used for transaction processing is expressed in transactions per second. The data rate is used to determine the throughput for systems that process large amounts of data, such as audio and video servers (in Megabytes per second). Additionally, a task's performance may occasionally be impacted by other factors that affect throughput, such as the quantity of tasks and machines, inter-task communication delays, and service start delays. It is a favourable standard.

Reliability: In the context of the cloud, "reliability" refers to how long a cloud service continues to operate without interruption under a set of operating conditions. It refers to how reliable a software instance is in the context of SaaS. The reliability of the platform is the focus of PaaS, whereas the reliability of virtual machines or storage services is the focus of IaaS. This is a favourable standard.

Portability:When something is portable, it can be moved from one system to another and still function on the new system. Data portability is the ability to quickly move the data from one cloud service to another without re-entering it. An essential component of data portability is ease of data movement. The ability to move an application or its components from one cloud provider to another is called application portability.

TABLE 1. Case study with dominant web services

	Throughput	Reliability	Portability	Response time
QuoteofTheDay	9.556	70.800	88.560	123.000
XigniteQuotes	1.554	36.700	77.540	152.000
StockQuotes	7.213	78.990	80.240	98.000
RealTimeQuotes	8.787	68.220	69.270	112.000
DelayedStockQuotes	1.554	24.850	70.245	132.000
HistoricalStockQuotes	2.14200	9.89000	89.56400	81.00000

Table 1 shows the dataset of the case study with web services. In this analysis, Evaluation criteria are Response time; Throughput, Reliability, Portability and Alternate parameters quote of The Day, Xignite Quotes, Stock Quotes, Real Time Quotes, Delayed Stock Quotes, and Historical Stock Quotes

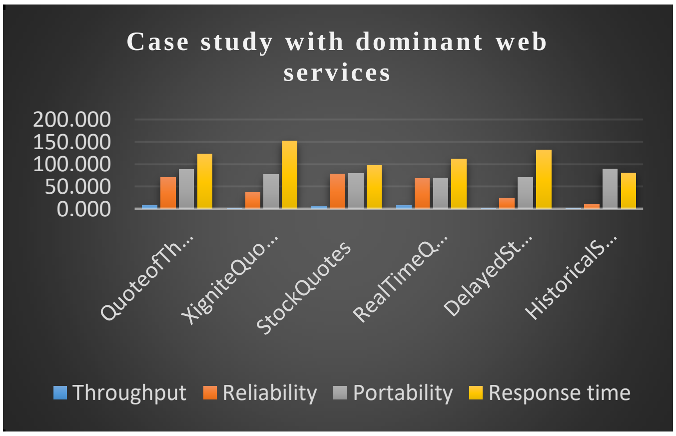

FIGURE1. Dataset for web services

Figure 1 illustrates dataset values of the Case study with dominant web services. Evaluation criteria: Response time; Throughput, Reliability, Portability and Alternate parameters: quote of The Day, Xignite Quotes, Stock Quotes, Real Time Quotes, Delayed Stock Quotes, and Historical Stock Quotes.

TABLE 2. Normalized Decision Matrix

	Normalized			
	Throughput	**Reliability**	**Portability**	**Response time**
QuoteofTheDay	1	0.89632	0.98879	0.65854

XigniteQuotes	0.16262	0.46462	0.86575	0.53289
StockQuotes	0.75481	1	0.8959	0.82653
RealTimeQuotes	0.91953	0.86365	0.77341	0.72321
DelayedStockQuotes	0.16262	0.3146	0.7843	0.61364
HistoricalStockQuotes	0.22415	0.12521	1	1

Table 2 shows normalised decision matrix array for Evaluation criteria: Response time; Throughput, Reliability, Portability and Alternate parameters: quote of The Day, Xignite Quotes, Stock Quotes, Real Time Quotes, Delayed Stock Quotes, and Historical Stock Quotes

TABLE 3. Weight age

	Throughput	Reliability	Portability	Response time
QuoteofTheDay	0.25	0.25	0.25	0.25
XigniteQuotes	0.25	0.25	0.25	0.25
StockQuotes	0.25	0.25	0.25	0.25
RealTimeQuotes	0.25	0.25	0.25	0.25
DelayedStockQuotes	0.25	0.25	0.25	0.25
HistoricalStockQuotes	0.25	0.25	0.25	0.25

Table 3Weight shows the informational set for the weight all same value 0.25.

TABLE 4. Weighted normalized decision matrix

QuoteofTheDay	0.25000	0.22408	0.24720	0.16463
XigniteQuotes	0.04066	0.11615	0.21644	0.13322
StockQuotes	0.18870	0.25000	0.22397	0.20663
RealTimeQuotes	0.22988	0.21591	0.19335	0.18080
DelayedStockQuotes	0.04066	0.07865	0.19607	0.15341
HistoricalStockQuotes	0.05604	0.03130	0.25000	0.25000

Table 2 shows weighted normalised decision matrix array for Evaluation criteria: Response time; Throughput, Reliability, Portability and Alternate parameters: quote of The Day, Xignite Quotes, Stock Quotes, Real Time Quotes, Delayed Stock Quotes, and Historical Stock Quotes

FIGURE 5. Preference score

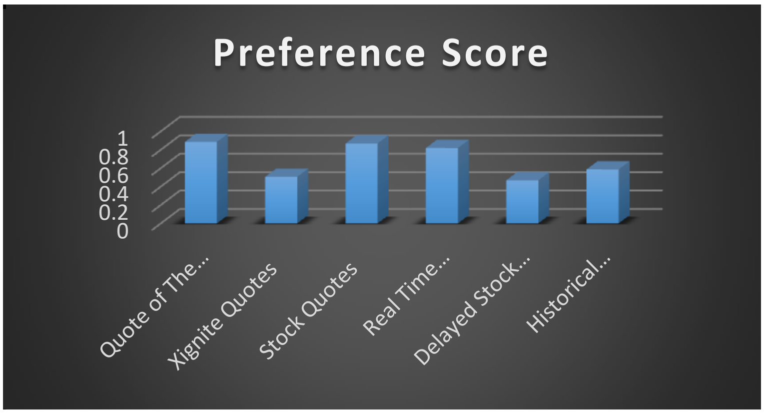

TABLE 5. Preference score

	Preference Score	Rank
Quote of The Day	0.88591	1
Xignite Quotes	0.50647	5
Stock Quotes	0.86931	2

Real Time Quotes	0.81995	3
Delayed Stock Quotes	0.46879	6
Historical Stock Quotes	0.58734	4

Table 5 shows the preference score value and rank. Here Quote of The Day got first with 0.88591, Stock Quotes have second rand with 0.86931, Real Time Quotes is third rank with 0.81995, Historical Stock Quotes fourth rank with 0.58734, Xignite Quotes fifth rank with 0.50647 and Delayed Stock Quotes is having value of 0.46879 with sixth rank.

FIGURE6. Rank

Figure 5 and 6 illustrates preference score and rank respectively. Here Quote of The Day got first Rank, Stock Quotes have second rand, Real Time Quotes is third rank, Historical Stock Quotes fourth rank, Xignite Quotes fifth rank and Delayed Stock Quotes is having the sixth rank.

Conclusion

The rapid growth of cloud computing is rapidly changing how software and applications are distributed and maintained. In addition, changing information objects May affect hardware suppliers, Because with the Internet for users Simple equipment may be required to connect and power from remote servers of resources and services Access an endless supply. Mobile pervasive computing is a big part of a problem and an opportunity.Cloud computing is a cloud service for users or customers, i.e. flexible, lightweight, reasonably priced, transparent, reliable, and, to some extent, private remote service. When considering costs and benefits, the term "cloud service" has a broad meaning. In choosing subscription-based on-demand services, choosing a cloud service is essential.Multiple cloud with comparable functionality as the services are, the customer's whichever best suits the needs and goals finding that fulfils necessary. A growing number of cloud providers Number and widely varying price The variety of programs, they offer Due to services, service quality and A cloud based on price It is becoming increasingly difficult to compare providers. This makes choosing a cloud service provider more challenging.

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