

ONLINE RESOURCES SCHEDULING UNDER CONCAVE PRICING FOR CLOUD COMPUTING-CLOUD COST OPTIMIZER

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Abstract -With booming growth of cloud computing industry, computational resources are readily and elastically available to the customers. In order to attract customers with various demands, most Infrastructure-as-a-service (IaaS) cloud service providers offer several pricing strategies such as pay as you go, pay less per unit when you use more (so called volume discount), and pay even less when you reserve.

The diverse pricing schemes among different IaaS service providers or even in the same provider form a complex economic landscape that nurtures the market of cloud brokers. By strategically scheduling multiple customers' resource requests, a cloud broker can fully take advantage of the discounts offered by cloud service providers. In this paper, we focus on how a broker may help a group of customers to fully utilize the volume discount pricing strategy offered by cloud service providers through cost-efficient online resource scheduling. We present a randomized online stack-centric scheduling algorithm (ROSA) and theoretically prove the lower bound of its competitive ratio. Our simulation shows that ROSA achieves a competitive ratio close to the theoretical lower bound under a special case cost function.

Keywords- Cloud Broker, Resource Scheduling, Cost Optimization, IaaS, Online Scheduling, Algorithm

1. INTRODUCTION

Cloud storage has emerged as a promising solution for providing ubiquitous, convenient, and on-demand accesses to large amounts of data shared over the Internet. Today, millions of users are sharing personal data, such as photos and videos, with their friends through social network applications based on cloud storage on a daily basis. Business users are also being attracted by cloud storage due to its numerous benefits, including lower cost, greater agility, and better resource utilization. Cloud computing is a recently evolved computing terminology or metaphor based on utility and consumption of computing resources. Cloud computing involves deploying groups of remote servers and software networks that allow centralized data storage and online access to computer services or resources. Clouds can be classified as public, private or hybrid.

Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a utility (like the electricity grid) over a network. At the foundation of cloud computing is the broader concept of converged infrastructure and shared services. Cloud computing, or in simpler shorthand just "the cloud", also focuses on maximizing the effectiveness of the shared resources. Cloud resources are usually not only shared by multiple users but are also allocating resources to users dynamically reallocated per demand. For example, a cloud computer facility that serves European users during European business hours with a specific

application (e.g., email) may reallocate the same resources to serve North American users during North America's business hours with a different application (e.g., a web server).

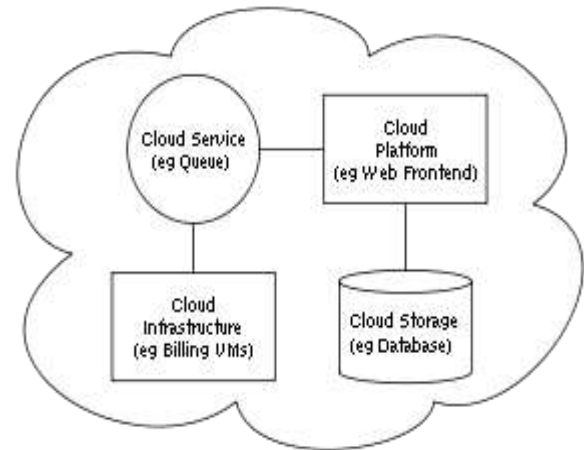


Fig 1: Cloud computing sample architecture

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The present availability of high-capacity networks, low-cost computers and storage devices as well as the widespread adoption of hardware virtualization, service-oriented architecture, and autonomic and utility computing have led to a growth in cloud computing. Cloud storage offers an on-demand data outsourcing service model and is gaining popularity due to its elasticity and low maintenance cost. However, security concerns arise when data storage is outsourced to third-party cloud storage providers. It is desirable to enable cloud clients to verify the integrity of their outsourced data, in case their data have been accidentally corrupted or maliciously compromised by insider/outsider attacks.

One major use of cloud storage is long-term archival, which represents a workload that is written once and rarely read. While the stored data are rarely read, it remains necessary to ensure its integrity for disaster recovery or compliance with legal requirements. Since it is typical to have a huge amount of

archived data, whole-file checking becomes prohibitive. Proof of retrievability (POR) and proof of data possession (PDP) have thus been proposed to verify the integrity of a large file by spot-checking only a fraction of the file via various crypto-graphic primitives. as-a-service.

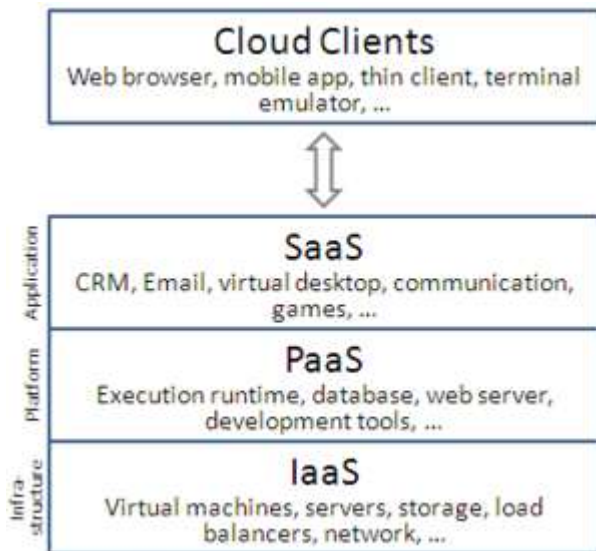


Fig 2: Cloud-computing layers accessible within a stack

2. LITERATURE REVIEW

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For example, a cloud computer facility that serves European users during European business hours with a specific application (e.g., email) may reallocate the same resources to serve North American users during North America's business hours with a different application (e.g., a

web server). This approach should maximize the use of computing power thus reducing environmental damage as well since less power, air conditioning, rack space, etc. are required for a variety of functions. With cloud computing, multiple users can access a single server to retrieve and update their data without purchasing licenses for different applications.

The term "moving to cloud" also refers to an Organization moving away from a traditional CAPEX model (buy the dedicated hardware and depreciate it over a period of time) to the OPEX model (use a shared cloud infrastructure and pay as one uses it). Proponents claim that cloud computing allows companies to avoid upfront infrastructure costs and focus on projects that differentiate their businesses instead of on infrastructure. Proponents also claim that cloud computing allows enterprises to get their applications up and running faster, with improved manageability and less maintenance, and enables IT to more rapidly adjust resources to meet fluctuating and unpredictable business demand. Cloud providers typically use a "pay as you go" model. This can lead to unexpectedly high charges if administrators do not adapt to the cloud pricing model.

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3. METHODOLOGY

ID-PUIC is a novel proxy-oriented data uploading and remote data integrity checking model in public cloud. This concrete ID-PUIC protocol comprises four procedures: Setup, Extract, Proxy-key generation, TagGen, and Proof. In order to show the intuition of our construction, the concrete protocol's architecture is depicted. First, Setup is performed and the system parameters are generated. Based on the generated system parameters, the other procedures are performed as:

(1) In the phase Extract, when the entity's identity is input, KGC generates the entity's private key. Especially, it can generate the private keys for the client and the proxy.

(2) In the phase Proxy-key generation, the original client creates the warrant and helps the proxy generate the proxy key.

(3) In the phase TagGen, when the data block is input, the proxy generates the block's tag and upload block-tag pairs to PCS.



Figure 3.1 home page



Figure 3.2 domain register



Figure 3 payment success

4. CONCLUSION

Cloud computing is an evolving paradigm, where new service providers are frequently coming into existence, offering services of similar functionality. Major challenge for a cloud customer is to select an appropriate service provider from the cloud marketplace to support its business needs. How-ever, service guarantees provided by vendors through SLAs contain ambiguous clauses which makes the job of selecting an ideal provider even more difficult. As customers use cloud services to process and store their individual client's data, guarantees related to service quality level is of utmost importance. For this purpose, it is imperative from a customer's perspective to establish trust relationship with a provider. Moreover, as customers are outsourcing their businesses onto a third-party cloud, capability or competence of CSP determines if former's objectives are going to be accomplished.

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