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COST OPTIMIZATIONS FOR HOSTING WORKFLOW-AS-A-SERVICE IN IAAS CLOUDS

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ABSTRACT

Data-intensive applications promising on Infrastructure-as a- Service (IaaS) clouds, and numerous workflow service provider's contribution workflow-as-a-service (WaaS). The major concern of WaaS providers is to minimize the monetary cost of executing workflows in the IaaS clouds. The assortment of virtual machines (instances) types considerably affects the monetary cost and performance of association a workflow. Moreover, IaaS cloud environment is dynamic, with high performance dynamics caused by the interference from concurrent executions and price dynamics like spot prices offered by Amazon EC2. Therefore, we disagree that WaaS providers should have the impression of offering probabilistic performance guarantees for individual workflows to explicitly expose the performance and cost dynamics of IaaS clouds to users. We expand a scheduling system called Dyna to minimize the expected monetary cost given the user-specified probabilistic deadline guarantees. Dyna includes an based instance configuration method for performance dynamics, and a hybrid instance configuration refinement for using spot instances. Experimental results with three scientific workflow applications on Amazon EC2 and a cloud simulator show the ability of Dyna on satisfying the probabilistic time limit guarantees necessary by the users; the effectiveness on dropping monetary cost in comparison with the existing approaches

KEYWORDS: Cloud computing, cloud dynamics, spot prices, monetary cost optimizations, scientific workflows

I INTRODUCTION

Cloud storage services such as Drop box, Cloud Me, and Sea file supply users with a convenient and reliable way to store and share data from anywhere, on any device, and at any time. The users' data (e.g., documents, photos, and music) stored in cloud storage are automatically harmonized across all the designated devices connected to the cloud in a appropriate manner. With multiplicity of devices – especially mobile devices – that users possess today, such "anywhere, anytime" features significantly simplify data management and consistency maintenance, and thus provide an ideal tool for data distribution and collaboration. In a few short years, cloud storage services have reached phenomenal levels of success, with the user base rising quickly.

For example, Cloud Me claims that over 200 million customers have stored more than 14 PB of data using their service, while Drop box has claimed more than 100 million users who store or update 1 billion files every day. Despite the late entry into this market, Sea file obtained 10 million users just in its first two months. The type process of cloud storage services is data synchronization (sync) which regularly maps the changes in users' local file systems to the cloud via a sequence of network communications. The universal data sync principle. In a cloud storage service, the user usually needs to assign a selected local folder in which every file operation is noticed and synchronized to the cloud by the client software developed by the service provider. Synchronizing a file involves a sequence of data sync events, such as transferring the data index, data content, sync notification, sync status/statistics,

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and sync acknowledgement. Naturally, each data sync event incurs network traffic. In this paper, this traffic is referred to as data sync traffic.

The Internet is increasingly a platform for online services such as Web search, social networks, and video streaming distributed across multiple locations for enhanced reliability and performance. The trend toward geographically-diverse server placement will only continue and increasingly comprise lesser enterprises, with the achievement of cloud-computing platforms like Amazon AWS. These services all need an efficient method to straight clients across the wide area to an appropriate service location (or "replica"). For lots of companies offering distributed services, managing replica selection is a redundant burden.

II RELATED WORKS

In [1] Ming Mao, Marty Humphrey et al presents A objective in cloud computing is to assign (and thus pay for) only those cloud resources that are really desirable. To date, cloud practitioners have pursued program based (e.g., time-of-day) and rule-based mechanisms to effort to mechanize this matching between computing requirements and computing resources. However, most of these "auto-scaling" mechanisms only hold simple reserve operation indicators and do not purposely believe both user performance requirements and resources concerns. In this paper, we present an approach whereby the basic computing elements are virtual machines (VMs) of various sizes/costs, jobs are specified as workflows, users identify performance requirements by transmission (soft) deadlines to jobs, and the goal is to guarantee all jobs are completed within their deadlines at least financial cost

In [2] Maciej Malawski, Gideon Juve, Ewa Deelman et al presents Large-scale applications expressed as scientific workflows are frequently grouped into ensembles of inter-related workflows. In this paper, we attend to an innovative and significant trouble regarding the proficient management of such ensembles under budget and goal constraints on Infrastructure- as-a-Service (IaaS) clouds. We argue, expand, and charge algorithms based on static and dynamic strategy for both assignment scheduling and resource provisioning. We perform the evaluation via simulation using a situate of scientific workflow ensembles with a broad range of budget and deadline parameters, taking into account uncertainties in task runtime estimations, provisioning delays, and failures. We find that the key factor determining the performance of an algorithm is its capability to choose which workflows in an together to admit or decline for execution.

In [3] Eun-Kyu Byun, Yang-Suk Kee, Jin-Soo Kim et al presents Workflow technologies have grow to be a major vehicle for simple and resourceful development of scientific applications. In the interim, state-of-the-art resource provisioning technologies such as cloud computing enable users to obtain computing resources dynamically and elastically. A dangerous dare in integrating workflow technologies with reserve provisioning technologies is to decide the right amount of resources required for the execution of workflows in order to minimize the financial cost from the perspective of users and to maximize the resource utilization from the perspective of resource providers. This paper suggests architecture for the automatic execution of large-scale workflow-based applications on dynamically and elastically provisioned computing resources

In [4] Siva Theja Maguluri and R. Srikant et al presents Cloud computing services are becoming ubiquitous, and are opening to provide as the major source of computing power for both enterprises and personal computing applications. We consider a stochastic model of a cloud computing cluster, where jobs arrive according to a stochastic process and request virtual machines (VMs), which are particular in terms of resources such as CPU, memory and storage space. While there are lots of suggest issues connected with such systems, here we center only on resource allocation troubles, such as the design of algorithms for load balancing among servers, and algorithms for scheduling VM configurations. Given our model of a cloud, we first describe its capacity, i.e., the highest rates at which jobs can be processed in such a scheme.

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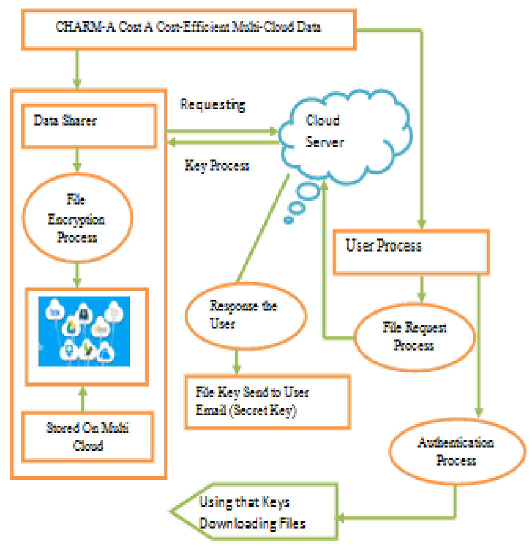
In [5] Fan Zhang, Junwei Cao, Kai Hwang et al presents Elastic compute clouds are best represented by the virtual clusters in Amazon EC2 or in IBM RC2. This paper proposes a simulation based approach to scheduling scientific workflows onto elastic clouds. Scheduling multitask workflows in virtual clusters is a NP-hard problem. Excessive simulations in months of time may be desirable to create the optimal schedule using Monte Carlo simulations. To reduce this scheduling overhead is essential in real-time cloud computing. We present a new workflow scheduling method based on iterative ordinal optimization (IOO). This new process outperforms the Monte Carlo and Blind-Pick methods to yield superior performance beside express workflow variations.

III PROPOSED SYSTEM

WaaS providers can decrease the monetary cost of hosting WaaS while contribution performance guarantees for person workflows. Monetary cost optimizations have been typical research topics in grid and cloud computing environments. Over the era of grid computing, cost-aware optimization techniques have been extensively studied. First, cloud is by design a shared infrastructure, and the interference causes significant variations in the performance even with the similar instance type. Previous studies have established significant variances on I/O and network performance. The assumption of static task finishing time in the previous studies does not clasp in the cloud. Under the fixed execution time assumption, the deadline notion is a "deterministic deadline". Due to performance dynamics, a more rigorous notion of deadline requirement is needed to cope with the vibrant task execution time. Second, cloud, which has evolve into an financial market, has forceful pricing. Amazon EC2 offers spot instances, whose prices are strong-minded by market demand and supply. Spot instances have been an effective means to reduce monetary cost, because the spot price is regularly much lower than the price of on-demand instances of the same type. However, a spot illustration may be terminated at any time when the command price is inferior to the spot price (i.e., out-of bid events).

ARCHITECTURE DIAGRAM

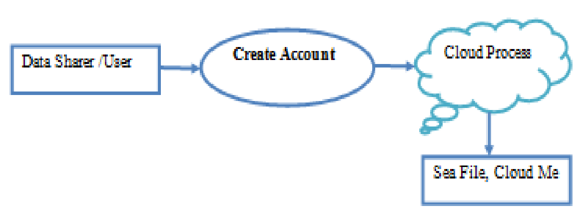


MODULES

- Multi-cloud
- Data hosting
- Cloud Storage
- Server Module
- Consumer Module

MULTI-CLOUD

Lots of data centers are dispersed around the world, and one region such as America, Asia, usually has numerous data centers belonging to the similar or different cloud providers. So in principle all the data centers can be contact by a user in a convinced region, but the user would knowledge diverse performance.



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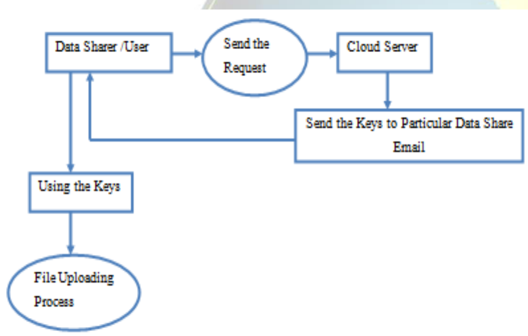
DATA HOSTING

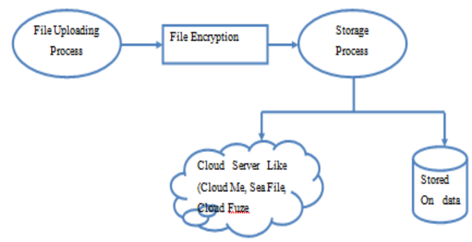
In the data hosting cost-efficient data hosting model with elevated availability in heterogeneous multi-cloud, named "CHARM". The whole model is situated in the proxy. There are four major components in CHARM: Data Hosting, Storage Mode Switching (SMS), Workload Statistic, and Predictor. Workload Statistic keeps collecting and tackling admission logs to guide the placement of data. It also sends guide information to Predictor which guides the action of SMS. Data Hosting stores data using replication or erasure coding, according to the size and access frequency of the data. SMS decides whether the storage form of persuaded data should be changed from replication to erasure coding or in reverse, according to the output of Predictor.



CLOUD STORAGE

Cloud storage services have happen to ever more admired. Because of the outcome of privacy, many cloud storage encryption schemes have been expected to protect data from those who do not have contact. All such scheme tacit that cloud storage provider are protected and cannot be hacked; however, in observe, some authorities (i.e., coercers) may strength cloud storage providers to disclose user secrets or confidential data on the cloud, thus altogether circumventing storeroom encryption schemes. In this paper, we there our intend for a novel cloud storage encryption scheme that enables cloud storage providers to generate convincing fake user secrets to defend user privacy.

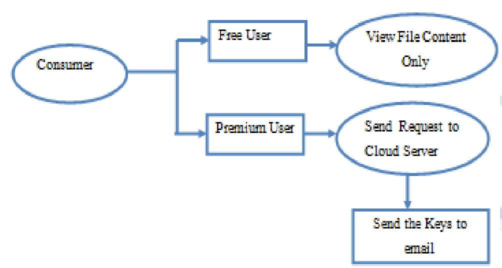
SERVER MODULE



Owner module is to upload their files using a few access policies. First they acquire the public key for scrupulous upload file after getting this public key owner appeal the secret key for demanding upload file. Using that secret key owner upload their file.

CONSUMER MODULE

This module is used to assist the client to investigate the file using the file id and file name .If the file id and name is mistaken means we do not obtain the file, otherwise server ask the public key and get the encryption file. If u needs the decryption file means user have the secret key.



OUTPUT RESULT

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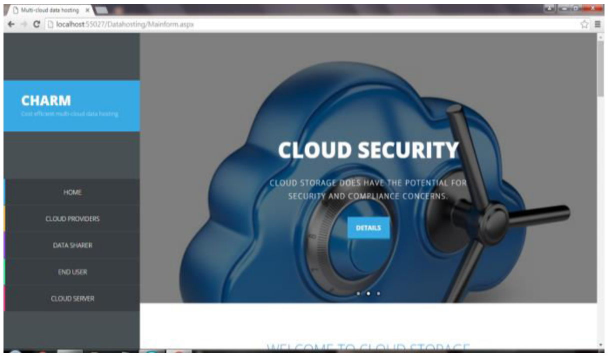
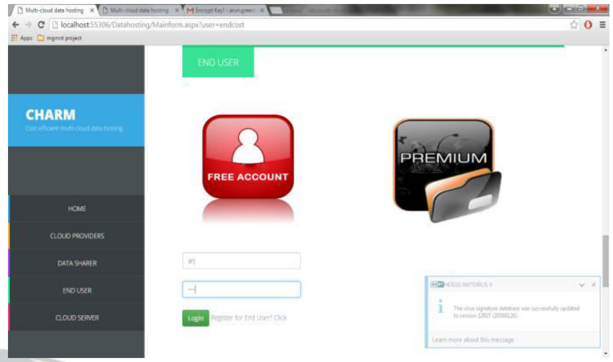
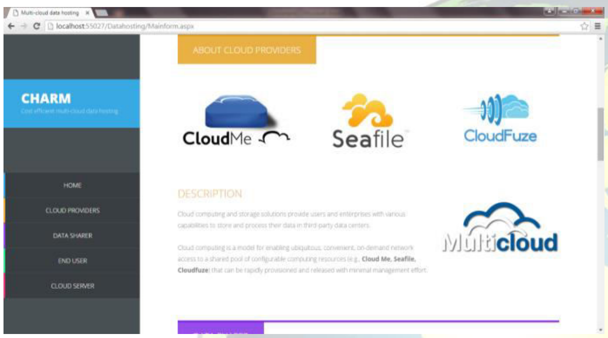
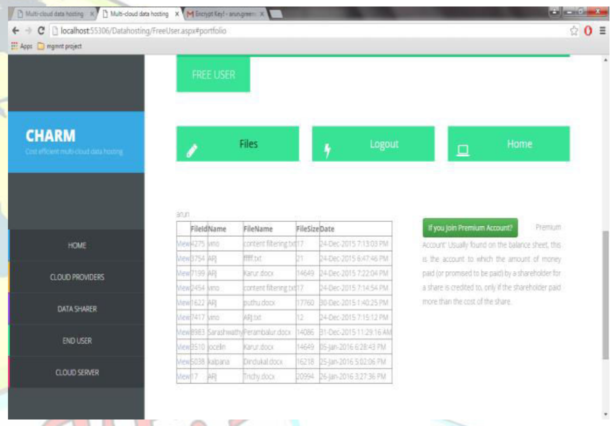


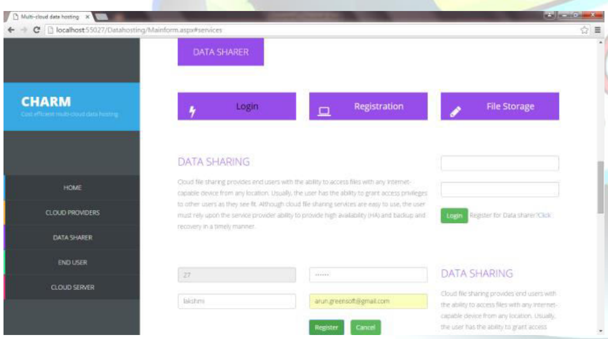


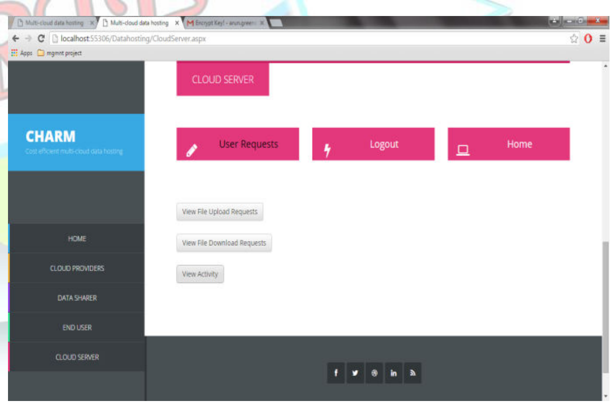
CLOUD SERVER

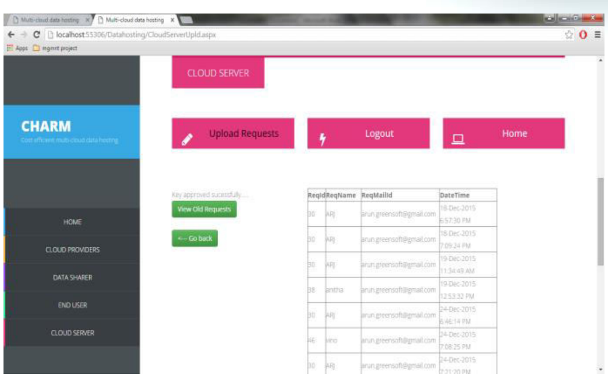




DATA SHARER REG







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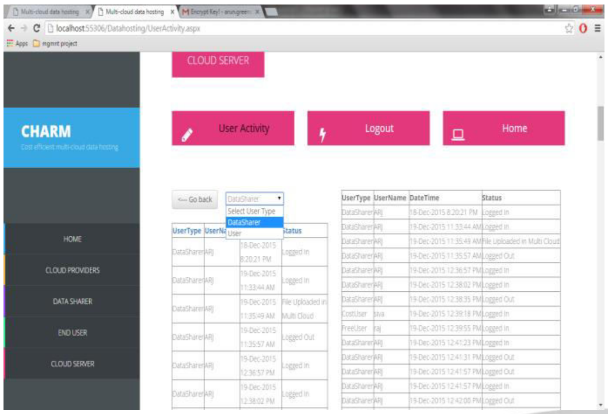

V CONCLUSION

As the popularity of various scientific and data-intensive applications in the cloud, hosting WaaS in IaaS clouds becomes emerging. However, the IaaS cloud is a dynamic environment with performance and price dynamics, which make the assumption of static task execution time and the QoS definition of deterministic deadlines undesirable. In this paper, we propose the notion of probabilistic performance guarantees as QoS to explicitly description the cloud dynamics to users. We develop a workflow scheduling system named Dyna to minimize the monetary cost for the WaaS provider while satisfying predefined probabilistic deadline guarantees for entity workflows. We develop an $A\star$ search based instance configuration technique to talk to the performance dynamics, and hybrid instance configuration of both spot and on-demand instances for price dynamics. We deploy Dyna on both Amazon EC2 and simulator and evaluate its effectiveness with three scientific workflow applications. Our experimental results reveal that Dyna achieves much lower monetary cost than the state-of-the-art approaches (by 73%) while guaranteeing users' probabilistic deadline requirements.

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