Content Distribution with Dynamic Migration of Services for Minimum Cost using AES

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Abstract— *Content Delivery Networks are the key for today's internet content delivery. Users are knowingly or unknowingly accessing the CDN via internet. No matter how much the data retrieved by the user it may contain the CDN hand behind every character of text and every pixel of image. CDN came into existence to solve the delay problem. The moment when a user requests for a web page and the response delivered to the corresponding users web browser facing a huge delay. The main goal of this paper is content distribution of web services to multiple data centers placed in different geographical locations and providing security. A content distribution service is a major part of popular Internet applications. In proposed system hybrid clouds are used i.e., both private cloud as well as public cloud. One data center is allocated to each region. Providing security to the data is always an important issue because of the critical nature of the cloud and very large amount of complicated data it carries. To provide security cipher text policy algorithm is used. Authentication technique is used to verify the user authentication. If the user is authorized to access services then and only he receives configuration key to use.*

Keywords— ***Content Delivery Networks, Content Distribution, AES.***

I. INTRODUCTION

Now a day's Cloud computing technology is used rapidly to access resources for various applications. There are different types of resources they are Computational resources, Networking resources (Computational resources such as Memory, CPU, Storage and Networking resources such as Bandwidth). Cloud provider's activities for utilization and allocating resources are within time of cloud environment. It requires the type and resources needed by each application to complete a user job. Order and time of allocation of resources are also an input for optimal resources allocation. In proposed system we used hybrid cloud for utilization of public cloud and private cloud. CDN (Content Distribution Network) when it accessing data it requests the cloud server and it search file on CDN. DCN (Data Content Network) it provides access key to user to access file. In dynamic migration technique used cold spot and hot spot. Hot spot technique is used to distribute load. This technique is used to achieve load balancing, increase performance as well as throughput.

A content delivery network or content distribution network (CDN) is a large distributed system of proxy servers deployed in multiple data centers via the Internet. The goal of a CDN is to serve content to end-users with high availability and high performance. CDNs are widely used in today's Internet topography, internet traffic is significantly increasing now-a-days. A high percentage of traffic is reduced due to the usage of CDNs and they efficiently deliver the contents and it's related services. A content delivery network is a highly-distributed platform of servers that responds directly to end user requests for web content. CDNs, carry nearly half of the world's Internet traffic. They are omnipresent by their presence and diminish the challenges of delivering content over the Internet.

The main goal of the proposed system is to minimize the operational cost over time for cloud provider as well as achieving load balancing and provide security. To provide security cipher text policy algorithm is used. Applying authentication techniques are used to verify the user authentication. If user is authorized to access services then and only he receives configuration key to use. User can access or used only key access pages. User cannot access or use other pages.

II. RELATED WORK

Shaolei Ren, Yuxiong He and FeiXu[1] et al. limited computational resources need to fairly allocated among different organizations. Resources are allocated to end user on demand. Fei Xu. et al. proposed the GreFar algorithm which is optimizing energy cost and farness among different organizations. This algorithm is achieving energy cost, latency as well as fairness.

Pathan et al[2] To realize this objective, during this paper, they measure the utility of content delivery via MetaCDN, capturing the system-specific perceived edges. They have a tendency to use this utility live to plot a request-redirection policy that ensures high performance content delivery. we have a tendency to conjointly quantify a content provider's edges from exploitation MetaCDN supported its user perceived performance. Chen et al.[3] proposes to create CDNs within the cloud so as to attenuate value beneath the constraints of QoS demand, however they solely propose greedy-strategy based heuristics while not obvious properties. In distinction, we target an optimization framework that renders optimal migration solutions for end of the day of the system.

Tang et al.[4] investigates the QoS-aware duplicate placement issues for responsiveness QoS necessities. During this paper they thought-about 2 categories of service models: replica-aware services and replica-blind services. In replica-aware services, the servers are alert to the locations of replicas and might thus optimize request routing to boost responsiveness. we have a tendency to show that the QoS-aware placement downside for replica-aware services is NP-complete. In blind services, the servers aren't alert to the locations of replicas or perhaps their existence. As a result, every duplicate solely serves the requests flowing through it beneath some given routing strategy. economical algorithms are projected to reckon the best locations of replicas beneath totally different value models.

Charikar *et al.* proposed a 4-approximation algorithm for solving the minimum K-median problem in [5]. This is so far the best known approximation algorithm in the worst case bound for the metric K-median problem. Kalpakis et al. [6] proposed an algorithm which considers all three costs (retrieval, update and storage). In this paper they considered only tree topology. But none of the works is related to provisioning cost between replica sites is relevant to the replication direction.

III. PROBLEM STATEMENT

The content distribution mainly involves two key points they are (i) back-end storage of the contents and (ii) front-end internet services that serve the user requests for contents. The data owner might migrate each service parts into the general public cloud: contents will be replicated in storage servers within the cloud, while requests will be sent to internet services put in on VMs on the computing servers. Our objective during this paper is to model a dynamic, optimal algorithm is to strategically make the subsequent selections for service migration into the hybrid cloud architecture: (i) content replication: which content ought to be replicated during which data center at every time? (ii) providing security: How the content owner should securely migrate data to his chosen data center?

Our algorithm focuses on minimizing recurring operational cost of the content distribution system, not one-time costs such as the purchase of machines in the cloud and contents. The content distribution mainly depends on how efficiently replicating the content in different data centers located at different geographical locations. The data owner has the freedom to select the data centers provide by different organizations.

IV. PROPOSED SYSTEM

In proposed system used techniques is Lyapunov optimization technique for minimization of cost. Their need to update cost dynamically when number of user requests from the cloud server increases. Lyapunov optimization is a powerful technique for optimizing time averages in stochastic queuing networks. Work in presents a drift-plus-penalty theorem that provides a methodology for designing control algorithms to maximize time average network utility subject to queue stability.

There is a public cloud consisting of data centers located in multiple geographical locations, denoted as set N. One knowledge center resides in every region. There are two forms of inter-connected servers in every knowledge center: storage servers for data storage, and computing servers that support the running and provisioning of virtual machines (VMs). Servers within identical knowledge center can access one another via a particular DCN.

An illustration of system architecture is given in fig.1. Data owner Browse Files and encode data and generate RSA Secret key. Data owner select the data centre and cloud server name from different data centers provided by different organizations. Data owner Upload data to corresponding cloud service provider. Data owner Verify the data from the cloud by SHA-512. Data owner is able to see the log about the cost and space of the cloud as soon as the control center updates in the corresponding cloud.

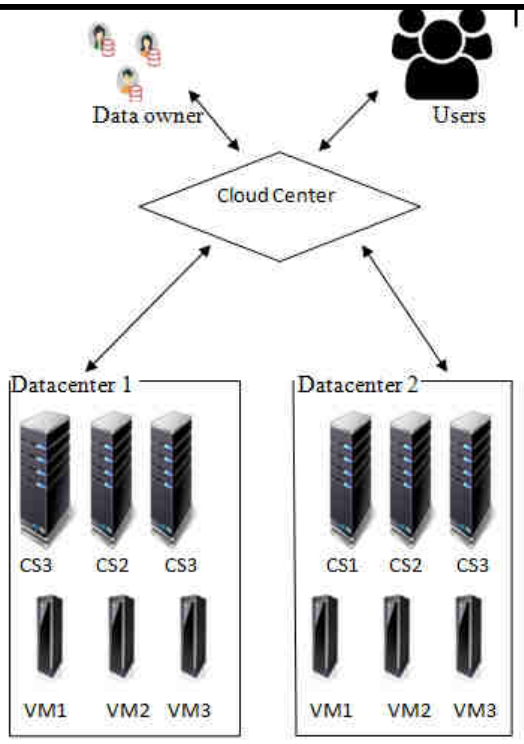

Fig.1: System Architecture

Control center is the key in our architecture which minimizes the cost. It chooses the low cost cloud and migrate the data owner contents dynamically and inform to data owner as a log about the data migration in the data centre. Data center receive all files from the data owner and check the corresponding cloud details and its storage services and store all files, Update or Assign memory for all VMS(vm1,vm2,vm3) for each cloud. It checks the data integrity in the cloud and inform to end user about the data integrity from the external attackers. It lists all cloud servers and their storage details (Memory, cost and owner validity) and keep track of information about different clouds. Provide data migration from one to another cloud based on the cost.

AES ENCRYPTION ALGORITHM:

To providing security to the data is always having a importance issue because of the critical nature of the cloud and very large amount of complicated data it carries, the need is even important. Therefore, data security and privacy issues that need to be solved have they are acting as a major obstacle in adopting cloud computing services.

It is a web tool to encrypt and decrypt text using AES encryption algorithm. You can chose 128, 192 or 256-bit long key size for encryption and decryption. The result of the process is downloadable in a text file.

1. Key expansion: From key schedules derives round key from its ciphers.
2. Initial round: a. Add round key – by using bitwise XOR combine each bit with round key.
3. Rounds:
   a. Sub bytes – each byte is replaced with another byte using a look-up table as a non-linear substitution.
   b. Shift rows – each row is shifted cyclically to a number of times called transposition.
   c. Mix the columns – combines four bytes in each column.
   d. Add round key
4. Final round – a. Sub bytes b. Shift rows c. Add round key

Encryption algorithm:

1) Inverse shift rows
2) Inverse substitute bytes
3) Add round key- step consists of XORing the output of the previous two steps
4) Inverse mix columns

V. CONCLUSIONS

In this paper studied various techniques and algorithms are load balancing, job scheduling to utilization of resources in proper ways. Virtualization techniques is one of the powerful feature of the cloud computing. Using the Lyapunov optimization technique which can minimizes the operational cost of the application with Quality of service guarantees. Applying AES algorithm we produced a secure data migration from data owners to the data centers. Achieving efficient load balancing as well as provide high security.

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