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Superiority of Facility Delivery in Cloud-Based Loading Scheme for Software Distribution

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Abstract— *Rapid increase in the traffic of internet is expected to happen due to the emergence of various multimedia applications, service and devices, multimedia delivery. In order to assist such enormous multimedia applications, additional service providers stores their video assets in the cloud and delivery streaming to their consumers cross cloud, for example, YouTube. As the growth of the consumers increased, the number of media content has been produced constantly. But the traditional cloud-based storage have two drawbacks such as, a lot of servers and storages devices are needed and subsequently to provide differential classes of services in the large-scale situation, system tends to need many additional devices. The paper proposes a system which is robust, scalable, highly available and service level provisioning cloud-based storage system designed particularly for distributing multimedia content. The proposed system is based on a proven Adaptive Quality of Service (AQoS) algorithm in order to provide differential service levels.*

Keywords: Fog figuring, Adaptive Quality of Service algorithm, Cloud based storage

1. Introduction

Fog Computing is a fast, growing and emerging technology that could provide elasticity, scalability, ubiquitous availability, and cost-effectiveness. There have been numerous studies about the definition and categories of cloud computing [1]–[5]; in fact, the "cloud" is more often used as "Metaphoring the Internet" where "Cloud-based" means network-centric [5]. More and more new topics are being studied from prior research fields which combine the concept of cloud. Multimedia cloud (or media cloud) aims to leverage cloud computing technologies for multimedia applications, services and systems. Researchers have proposed various kinds Moreover, according to [9], the multimedia-related traffic has been predicted to account for around 90% of the global Internet Protocol (IP) traffic that will reach 1.3 ZB per year in 2016. Therefore, an important research issue is how to deliver such large amounts of multimedia content which is stored in and crossed over the cloud. However, one key challenge is effectively.

Transferring the multimedia on the clouds while providing quality of service (QoS) provision [7]. In particular, QoS provision needs to be considered in cloud-based storage system that is responsible to store and fetch

data for others' applications and services in the cloud computing systems. Regarding the delivery of multimedia from/to the cloud, the most challenging work is how the cloud storage can provide distributed parallel accessing of media asset for millions of users with different service levels. Therefore, this paper proposes a QoS-provisioning cloud storage system, which is particularly aiming at distributed parallel accessing of media asset for millions of users with different service levels. The rest of this paper has been organized as follows. Some related works are mentioned in Section II. The proposed cloud storage system and related algorithm in Section III. The implementations outline and experimentation study are depicted in Sections IV and V, respectively.

Ventional client/server, content delivery network (CDN) and peer-to-peer (P2P) [13]. For media cloud and delivery, transmissions from/to the media cloud to/from the outside, the QoS requirements are as very important [14]. Like Youtube [15], Netflix [16] and Hulu [17] the "over-the-top" (OTT) service providers, for example, serve the video streaming from the private or public cloud to their consumers over the open Internet that is not offered by that network operator.

2. Background and Related Works

A large amount of work has been carried out in the area of multimedia and as well as cloud computing [6]–[8] and [10]–[12]. Zhu et al. [7] introduced the prime concepts of multimedia cloud computing from multimedia cloud and also they planned a media-edge cloud (MEC) architecture. MEC can reduce delay and jitter of media streaming and provides better QoS of multimedia service. Moreover, the authors consider the QoS related issue is very important either multimedia cloud or cloud media.

Certainly, it is most important to provide QoS awareness and provision for multimedia delivery, no matter what the delivery infrastructures are adopted. For example, the OTT (Over the top) service system needs to guarantee its system QoS provision on streaming server. YouTube user can watch a full HD video smoothly, for example, it means the YouTube system can pump over 4 Mbps throughout between servers and client; moreover, the servers need to be able to fetch sufficient amount of data from the storage.

The future enhancement of the proposed system is to develop the content scheduling algorithm in order to balance the access load on all storages as far as possible to reduce the hot spot storage. Some storage is ultimately popular and cannot even serve high class users properly.

2.1 Cloud Storage

Cloud storage is the idea of the cloud computing which has been developed as a new paradigm. It is a system which uses application software to make large amounts of storage equipment implement collaborative work and it also

provides business visit service by hosting application which is the grid technology. Input and output (I/O) and storage always is very important issue in computer architecture, it is very difficult to balance between speed, capacity and cast [18].

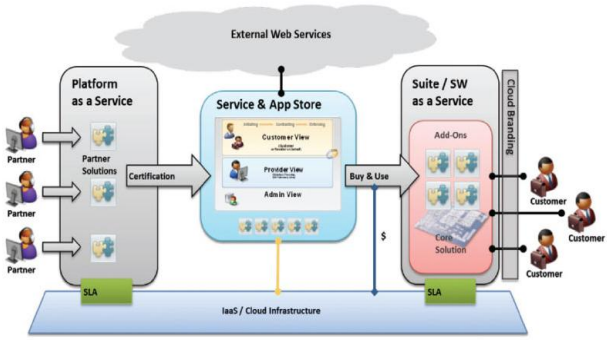

Fig. 1 System model of a typical cloud media

2.2 System Plan Areas

As referred to the prior background and related works, is necessary to design and deploy the storage system with provision for a multiple class-aware multimedia delivery service.

2.3 Multiclass Service Aware

The multiclass service awareness is an import requirement of a cloud system for multimedia application. The users in the system are divided into server class users. The basic requirement is that the users in the system are divided into two levels: high class and low class. The high class users can always use the service and low class users need a mechanism to determine whether the services can be used. In the case of large number of users, the serious issue is to schedule the resources finely in the content delivery system. Therefore, an algorithm has been developed which achieves the goal of using minimal storage space with the best resource scheduling among different users.

2.4 Scalability

Scalability is an additional target that the system must be able to scale up and scale down in the different size environment. Developing a system architecture which can be used in small and large circumstances simultaneously is a challenge. The design idea is that the each component in the system needs to be loosely coupled and every component could also be scaled up and scaled down by itself.

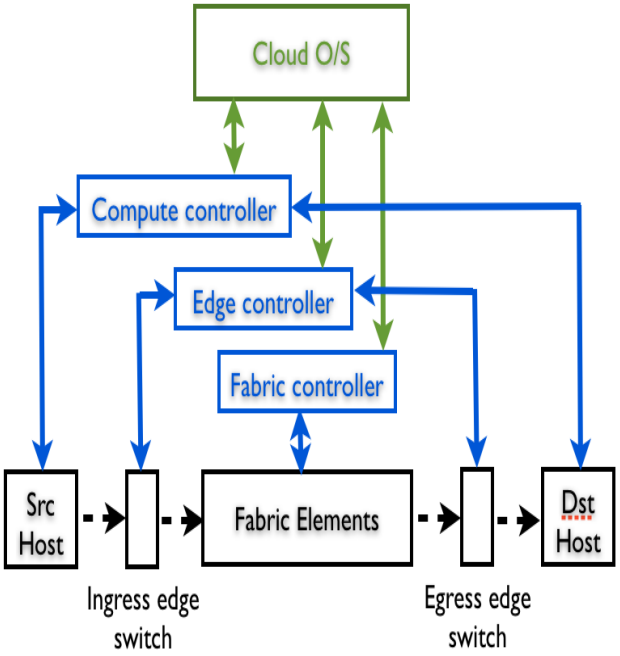

Fig. 2 Proposed system block and flow Diagram

3. Workshop Challenging

As mentioned earlier, there are three mainly infrastructures which can be used to build our system. Experimenting in NAS infrastructure is a good choice, because it is cheaper than SAN-based infrastructure and is more representative than DAS infrastructure. The SAN-based infrastructure with GFS has already been deployed in online system, and paper will present this part in the next section. The whole experimental environment is built on a single physical server which has 8 GB RAM and 8 CPUs. The experimental server runs with VMware vSphere Hypervisor (ESXi) 4.1 Build 260247 in order to simulate multiple virtual servers simultaneously and form the whole system. three virtual servers (cds1, cds2 and cdsadm). Each virtual server has 1 GB RAM, 20 GB disk space, 1 core CPU, 2 NICs (eth0 for extranet, eth1 for intranet). The virtual switch which has 120 ports also needs to be emulated.

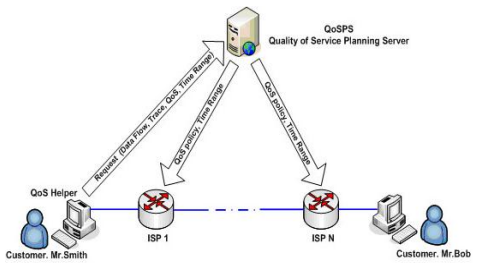

Fig. 3 Proposed system block and flow Diagram.

4. Results

A cloud storage system was planned as proposed in order to provide robust load-balanced, highly available and scalable services. In the meantime, the system also needs provided quality of service provision for multimedia applications. Hence, the scheduling algorithm dispatched resources properly between difference service level end-users in the system and has been proved both in theory and practice. Experimental results showed that the system's loading which only serves end users with low class are stable even.

5. Conclusion

It is the important characteristic especially in large scale environment which generally has some high class users and over crowd of low class users. Practical results showed that the proposed system has passed the severe examination of business environment which needs to not only serve many users concurrently but also provide many enterprise features such as robustness, scalability, high availability and load balance in order to ensure 24-hour operation night and day. Moreover, It was shown that the proposed system achieves the three functions of a multimedia-aware cloud [7]: 1) QoS supporting and provisioning, 2) parallel processing in distributed environment, 3) QoS adaptation. There are some future works in the proposed system. Since system stores contents on storages randomly, the content scheduling algorithm could be developed in the future in order to balance the access load on all storages as far as possible and avoid hot-spot storage to a certain extent. Another issue is that whether some storage is ultimately popular and cannot even serve high class users properly.

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