Dynamic Bandwidth Allocation in Cloud Computing

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Abstract—**Cloud Computing is a use of computing resources that is delivered as a service over a network. Sharing the data in the cloud depends on the network performance of the data centers. Bandwidth allocation plays a major role in sharing the resources towards the data center networks. Server performance is the major problem in cloud computing. When multiple users send a request for the same server at a time, the performance of the server is considerably decreased. So we describe a novel method of reallocating the bandwidth dynamically from passive users to active users using bandwidth mutual sharing and fair sharing technique.**

Keywords-Cloud Computing, Performance analysis, Bandwidth mutual sharing, fair sharing techniques.

I. INTRODUCTION

Cloud Computing refers to many different types of services and applications being delivered in the internet cloud, and the fact that, in many cases, the devices used to access these services and application do not require any special application. It presents a new way to supplement the current consumption and delivery model for IT services based on the internet, by providing for dynamically scalable and often virtualized resources as a service over the internet. The main characteristics of cloud computing is dynamic provisioning. Dynamic provisioning allows the provision of services based on current demand requirements. This is done automatically using software automation, enabling the expansion and contraction of service capability, as needed. This dynamic scaling needs to be done while maintaining high levels of reliability and security.

Cloud computing has a service-oriented architecture in which services are mainly divided in to three categories: (IaaS) Infrastructure-as-a-Service, IaaS - cloud providers supply the resources on-demand from their large pools installed in data centers. For wide-area connectivity, customers can use either the Internet or the carrier clouds . (Pass) Platform-as-a-service, In the PaaS model, cloud providers deliver a computing platform typically including operating system, programming language execution environment, database, and web server.(Sass)-Software-as-a-service, In this model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients.

Cloud computing consists of many computation types such as Public cloud, private cloud and Hybrid cloud. Public cloud - The public services are free or offered on a pay-per-use model. Private cloud -private cloudshares infrastructure between several organizations from a specific community with common concerns whether managed internally or by a third-party and hosted internally or externally. Hybrid cloud - Hybrid cloud is a composition of two or more clouds (private, community or public) that remain unique entities but are bound together, offering the benefits of multiple deployment models.

Figure 1. Cloud Model Diagram

A. *The main problems in cloud computing*

1) Security and Privacy: Perhaps two of the more "hot button" issues surrounding cloud computing relate to storing and securing data, and monitoring the use of the cloud by the service providers.

2) *Lack of Standards:* Clouds have documented interfaces; however, no standards are associated with these,

and thus it is unlikely that most clouds will be interoperable.

3) *Continuously Evolving:* User requirements are continuously evolving, as are the requirements for interfaces, networking, and storage. This means that a "cloud" especially a public one, does not remain static and is also continuously evolving.

4) *Compliance Concerns:* The Sarbanes-Oxley Act (SOX) in the US and Data Protection directives in the EU are just two among many compliance issues affecting cloud computing, based on the type of data and application for which the cloud is being used.

5) *Static bandwidth allocation:* wastage of bandwidth so the server performance are decreased, maintenance are difficult.

B. The applications of cloud computing

Access to information and services from anywhere. So it is very useful for user to collect the resources easily. We collect the resources simultaneously from cloud server as per as pay and free.

Companies with ease of scalability because have managed to reduce the risk that were otherwise there due to paying for extra servers of data storage. Main advantage was no installation cost for using the software.

A service application running in such a computing environment is associated with an SLA since a customer pays only for used resources and services. The service load in cloud computing is dynamically changed upon end-users' service requests. That is, the customer in the preceding discussion may represent multiple users, and generates service requests at a givenrate to be processed at the service center hosted by the service provider through the cloud. According to QoSrequirements and for a given fee.

II. EXISTING SYSTEM

In existing process it is focused on increasing the performance of the server by solving it to obtain accurate estimation of the complete probability distribution of the request response time and other important performance indicatorswhich has been described in novel approximate analytical model for performance evolution of cloud server farms.

The model allows cloud operators to determine the relationship between the number of servers and input buffer size, on one side, and the performance indicators such as mean number of tasks in the system, blocking probability, and probability that a task will obtain immediate service, on the other services.

It is vital to isolate the network performance between the clients for ensuring fair usage of the constrained and shared network resources of the physical machine. Unfortunately, the existing network performance isolation techniques are not effective for cloud computing systems because they are difficult to adopted in a large scale and require non-trivial modification to the network stack of a guest OS.

A. Problem Statement

1) *Wastage of bandwidth and reduce performance of the server:* The number server is comparatively small, typically below 10, which makes them unsuitable for performance analysis of cloud computing data centers. Then user may submit many task at a time because of this bags-of-task will appear. A cloud center can have a large number of facility nodes (server).typically of the order of hundreds or thousands; traditional queuing analysis rarely considers systems of this size. Due to the nature of the cloud environments, diversity of user's requests and time dependency of load, cloud centers must provide expected quality of service at widely varying loads.

2) *More expensive*: They not even mention the priority in static bandwidth allocation. So the passive user lost their cost.

3) *Performance:* A performance problem may be identified by slow or unresponsive systems. This usually occurs because high system loading, causing some part of the system to reach a limit in its ability to respond.

III. PROPOSED SYSTEM

In order to increase the performance of server, it is needed to re-allocate the bandwidth from passive user to active user. To perform the process of execution, the entire implementation is splited into four modules and those modules are as follows.

- Cloud server resource offers
- Bandwidth allocation
- Performance- analysis queue
- Bandwidth mutual sharing

1) *Cloud Server Resource Offers:* Normally most of the users are started to access cloud due to the latest developed technologies, for accessing cloud we require certain bandwidth resources which cloud has to offer us. Among all the resources band width is the important one, if the availability of bandwidth is good then only the user can access the cloud well without any net traffic.

2) *Bandwidth Allocation*: When a user requesting for a resource to the cloud server which was being processed by multiple client then the users resource will be allocate to the cloud server according to the CPU usage of the cloud server which was verified by the main server. We have to create a cloud server in the performance analysis way, which will do multiple resources simultaneously and if multiple users is trying to access the client at a time, so the cloud server should be designed in the way that it should response simultaneously for all the users under the

performance analysis as well bandwidth allocation. The mechanism is optimized for the purpose of connectivity since it uses the concept of bands created by partitioning the client using multiple clients. These bands are used to help control the direction of data flow of server, the key idea is that our approach will reduce the propagation of energy thus reducing energy consumption.

3) *Performance- Analysis Queue*: It is the technique to set up the preferred bandwidth in the server region. Computational precision and the accuracy of the final result have a complicated, non-monotonic relation, so that in general an increase of precision can lead to a decrease of accuracy.

4) *Bandwidth Mutual Sharing:* Here there is any way that can check what speed / bandwidth all of the other computers connected to the network have to see if others in the different routers have somehow prioritized their computers over mine, or have restricted the amount of bandwidth which is used by other users. The fixed-size window control can achieve fair bandwidth sharing according to any of these criteria.

IV. CONCLUSION

We proposed innovative approaches for increasing the performance of the server in cloud computing. Re-allocating a bandwidth from passive user to active user using the technique bandwidth-mutual sharing and fair sharing techniques.

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