

# Impact of Latency on Domains of Cloud Computing

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## Abstract—

Cloud Computing is a model in which customers plug into the “Cloud” to access I.T resources which are provided on demand & charged as per use to enhance performance and speed. The Problematic area in Cloud Computing is the aspect of Performance. So far looking into the architecture of cloud computing, it consists of cloud end providing with the rented resources, end user’s using the resources and the network connecting cloud to the end user. Impact of performance at the cloud end comes due to virtualization where the two vm’s co-located at the host server find latency problem while communicating with each other[3]. At the network end latency can cause application to spend amount of time waiting for the responses from the distant center, then the bandwidth may not be fully utilized and performance will suffer[1]. This paper presents an overview of areas in cloud computing which can give rise to latency hampering speed and performance and how researchers have worked to eradicate latency at cloud and network end but there is still a loop hole at the user end which can create latency problems through service disruption attacks like Dos and DDos and thus need some proper security mechanism at the users end to stop this type of attacks.

**Keywords—**Cloud Computing, , Latency, Applications.

## I. INTRODUCTION

**1.1 Cloud Computing-** Outsourcing of data center functionality and availability of desktop application online via network connection is what we term cloud computing. Companies are moving to cloud computing to cut down the I.T cost having the security with less I.T staff. The expense have been cut down & traffic of network has increased to double times. The big concern for organizations depend on the availability, quality and performance of their internet connection

### 1.2 How to use the Cloud

Simple log on to the sites that offer cloud facilities. You can sign up and pay online where it is not free. DropBox.com, Zoho.com, Box.net, Docs.google.com, office365.com, outlook.com, tally.com are cloud sites.

### 1.5 Flip side of Cloud Computing

The big concern for organizations depends on security, availability, quality and performance of internet connection. Most of the data that you store on the cloud is accessed by a

## 1.3 Services offered

Email	Whether you are using Gmail, Yahoo mail or Outlook.com, the email is stored on the cloud. The front end website that you visit connects you to the cloud where the data is stored which is backend. Your email is send to the nearest server.
File Storage	Earlier we used to stored files on Floppy disks and then went on to CD’s. Now storage is too easy and cheap as it is on the web.Box.net or Dropbox stores files and helps you switch easily between your laptop storage and “cloud storage”
Sound /Video	When you watch a video on YouTube you have “cloud servers” at the back-end streaming your favourite video. Sites such as Saavn.com and Hungama.com let you stream music for free in a similar manner.
Social Media	Social media sites such as Facebook ,Twitter or Google+ would have remained small and localized affair if we did not have cloud computing.  With networks, routers, computers and engineers working behind the scene and data movement at the speed of light, social media networks have become great example of cloud computing and storage.

## 1.4 Advantages

As long as you have an internet connection, you can hook up to a cloud service and get storage ultra cheap. Some sites offer basic stuff for free

Basic facilities on paid sites cost around \$10(500)rupee a month)

username and password. Typically the username is your email id, which is known to others. But your password is the key to your sound sleep: the more complex it is, the tougher it becomes to crack. Another aspect of flaw in cloud computing is performance where end users will abandon

applications and websites based on smallest performance delays or downtime.

## 2. DOMAINS OF LATENCY FROM CLOUD TO END USER

Latency can occur in cloud area, in networks connecting cloud to the end user and at the user end .Latency can be measured by applying the formula.

$$CL1 + NL2 = TSL$$

R stands for router, S stands for switch and CL stands for cloud latency.

### 2.1 Intra Cloud Latency

CL is cloud latency.

NL is network latency.

TSL is total system latency

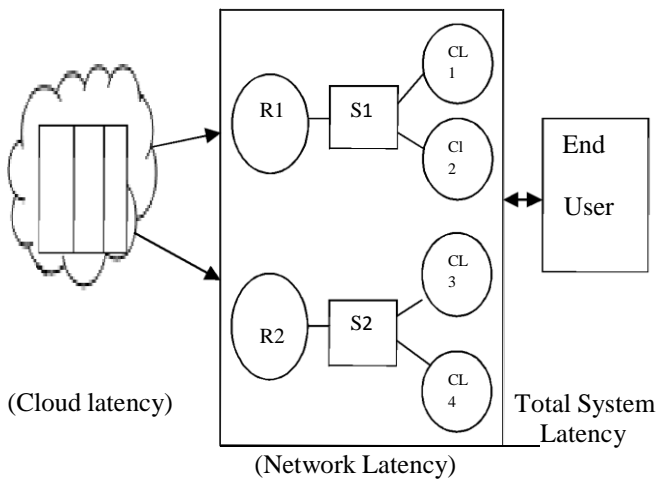


Fig 1: Domains of Latency in Cloud Computing Network

computer network security. It presents a comprehensive suggestions to solve the problem in modeling and simulating in the field of Information Security.

Ankush Veer Reddy[4] designed a security model by

In cloud, latency can arise when two vm's co-located on the same server communicate with each other. This problem is limited by introducing Nahanni memcached, a port of the well-known memcached that uses inter-VM shared memory instead of a virtual network for cache reads. Face book ,for example employs memcached as one of several caching layers[3]

### 2.2 Network Latency

Network latency cause applications to spend amount of time waiting for responses from a distant data centre, then the bandwidth may not be fully utilized and performance will suffer. Network latency is comprised of Propagation delay, Node delay and Congestion delay[1]. Good network design can minimize node delay and congestion delay but not propagation delay.

## 3.. RELATED WORK

Adam Wolfe and Paul Lu[3] proposed a memcached named Nahanni Memcached which can reduce the communication overhead between Virtual machines (VM) located in same server and used it with VDE networking to improve the total read latency for a workload by upto 45% (i.e read latest workload) compared to standard memcached.

Ajith Singh and Hemalatha [1] conducted a survey on how latency occurs in different geographical location. Also revealed an analysis work of how different browsers provide different latency. A test conducted to show effect of bandwidth reveals that when one tries to access cloud based Google docs in cybercafé or GPRS connection it took 20 sec while when tried to open at the campus of university which provides 5.4 mbps it opens in 2 sec .The problem of latency in the cloud network will be solved with the faster adaption of 3g and 4g in the coming years.

Mohammad Haideri[2] tried to highlight the modeling and their impact on computer and networks. He explained applications of M&S for modeling and simulation of implementing firewall in the cloud network. Evaluated the performance of database application that were accessed from an internet cloud under the guidance of firewall. In general when a firewall is attached to the network, the overall performance of any application against traffic send or

received is degraded. Designed firewall scenario for data and web security.

Raihana, Faizal, Zul Azri, Zaki, Siti Rahayu and Robiah [5] addressed the current trend of botnet detection technique and identified the significant criteria in each technique. Several existing techniques are analyzed from 45 researchers and the capability criteria of botnet detection technique have been reviewed.

Nagaraju Kilari and Dr.R.Sridaran[6] did the classification of various security threats presented in this paper to provide benefit to the cloud users so as to make proper choice and help cloud service providers to handle such threats efficiently. Also has suggested the future work to develop a model to detect and prevent the most common virtualized related threats.

researchers to eradicate problem of latency affecting performance. Our future work will be to simulate the cloud network and apply security attack (DDos attack) on cloud based applications and thus measure the various impact factors affecting cloud based network so as provide cloud vendors some awareness and hazards about such attacks.

## References

### 4. PROBLEM DEFINATION

In cloud network, researchers have worked to eradicate latency at cloud and network end but there is still a loop hole at the user end which can enhance latency through service disruption techniques i.e Dos and DDos attacks. Work needs to be done at the user end to built a trusted network between cloud vendor to end user so as to limit the possibility of such attacks.

### 5. CONCLUSION AND FUTURE WORK

Service disruption is one of the security threats in cloud computing which is hampering the trust between cloud vendor and client by deteriorating performance and overcharging at the users end. This paper attempted to highlight the domains in cloud computing affecting performance and also highlighted the related work of

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