

# A Best Approach to Load Balancing in Cloud Computing Security Using SSL in IaaS Infrastructure

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**Abstract** – Now a days there is low performance of cloud computing service provider cloud computing service provider allow users to hire a service on rent basis to use high cost software and hardware resources so now a days this feature are usable without suffering discontinue services and performance of the system the secure socket layer and associated security algorithm come with internet age and first introduce by Netscape but some problem found with it which is found by some researcher. Now a days cloud computing facility are face problem of performance degradation but we have to avoid such problem. In this paper we have to avoid such problem so we propose a solution on that so in existing system the commercial offering from the F5 Inc a new network equipment manufacturer introduced a product BIG-IP With in simultaneous approach high availability load balancing and secure data channel

**Key Words:** Key words: Secure Socket Layer (SSL), Local TrafficManager (LTM), Access Policy Manager (APM), Infrastructure – as – a – Service (IaaS), Throughput

## 1.INTRODUCTION

We have not clear about the internet which give lots of challenges with respective node the problem is related to security and performance. In 20<sup>th</sup> century netscape launched new secure socket layer to provide secure medium to travel data in internet so SSL provide us a better data transmission in internet in secure manner so data transmission is slow as compare to where security is not available for data transmission a new protocol released by SSL in public domain on transport layer as cloud computing uses are increases day by day for secure data transmission a new protocol introduced by SSL and VPN it is necessary to use secure data transmission in public domain so security is major issue while data transmission in public domain and also data loss is major issue during data transmission so we have made a provision without data data loss communication will happen to increasing data transmission on cloud we require a large no of data centers and also we require to manage large no of data we require a server nodes in a network so load balancer is a middle system to manage all load on servers in network and manage this load over a distributed network system. This will help in network to manage reliable data communication even if any failure comes in network it will efficiently manages the data transmission without discontinuing communication so this will happen in case of server node fails the communication redirected to closest server by compromising efficiency of network to maintain efficiency of network a load balancer will maintain some server idle with some busy server so to choose best suitable load balancer in network it is very difficult task when chosen server is already overloaded so here we have to verify CPU load free memory space to determine the server

will assign a task or not a proper load balancing technique is used to handle simultaneous questionnaires from multiple nodes without degrading performance of networks.

## 2. Literature review

### 2.1 Overview of secure socket layer

A secure socket layer it gives us a secure connection between server and client with secure data transmission with conformability of secure data transmission a secure public key algorithm used at both the ends of client and server. Handshaking between server and client is using the secret key the client and server computer uses secret key for encoding and decoding of data during data transmission the client computer connect to server using SSL protocol the cipher spec us by the client computer while other end server responses to client computer by using list of cipher spec at this time server send a certificate including public key of first message that certificate involve server computer identity public key and other description in network environment security is maintain by Certificate authority(CA) responsible for handling authenticity of server and client computer the secure channel is used to get a certificate by the server computer the CA consist of public key here message digest algorithm used to generate the fingerprint the certificate consist of various identity details such as of servers identification servers public key and other relevant information the message digest accept data stream and produce a fixed data in nature the fingerprint encrypted by using private key to produce certificate signature so a public key decipher the signature and already calculated fingerprint and client computer identify fingerprint separately if there is no match between fingerprints that means this some unwanted person try to modify the certificates so matching certificate is important in between data transmissions so both client and server computer determine the matching secret key by using public key algorithm so here agreement between client and server computer is important while data transmission client and server computer before transmission data it will first convert in to a coded form this will added in MACs that is message authentication code which are fingerprints and data messages added to the data in messages so MACs are encrypted data so for both client and server computer completed their message with including SSL in it by encrypted secret key so at either side this encrypted message is decrypted the MACs value and calculated and match with original MAC value to identify data.

## 2.2 Load Balancing

Cloud computing uses increasing day by day in all areas such as sports, political, news and entertainment so internet is a measure media by using cloud computing information transferred through servers so data load on servers increases so we have to manage load on servers and balancing factors is also required the first the maximum no of users access information simultaneously at a same time on cloud the second thing we to manage all resources on cloud and optimum use of resources in cloud computing environment so in external environment the load balancer is use at data centers which serve users request. The load balancer is embed with virtual servers that are service point this will manage the traffic in between server and cloud to return the communication in general situation the load balancer some have following steps:

1. Users are trying to uses the service which is connected by load balancer
2. Load balancer manages the switching of destination IP and match of port for data communication and incoming request is routed to appropriate destination the selection of port no is depends upon service offered by host server the IP address is not affected of client computer.
3. Servers in cloud environment and data centers accept request and data connection is manage by load balancer and request coming from load balancer manage by servers and routed to same on single channel
4. On the return journey of packets from source servers the load balancer change the IP address of and port to match the virtual servers the packet which are transmitted to client computers.
5. The client computers receives that return packet and back communication happen to virtual servers.

## 2.3 Network load balancing approach

The network load balancer uses ADCs application delivery collectors its operate independently and supports applications with respective application servers basically ADCs are used to virtual servers application for outside world .The users in the network directly connect to ADCs and locate their respective servers and uses bidirectional communication by using NAT load balancer select important server from several server for incoming connection by using health monitor and complexity of servers in the situation where physical server is not much that of capable of handling task load balancer directly automated the re-route traffic from affected server to restore to normal operation the health monitor in load balancer they are developed by application developer the modification of hardware to make consistent performance in case of your network enhancement we have to provide virtual service to load balancer the maximum output is limited in network based load balancer to improve performance we have to optimize cost of hardware resources required to load balancer high availability(HA) by launching hardware base load balancer on the other end also introduced hardware based load balancer introduced to reduce fault tolerance.

## 2.4 load balancing terminology

With respective load balancing there is different terminology present such as node, host, member, server the node and server defines the physical server that is used to receive inbound traffic from load balancer in case of absence of load

balancer the IP address is the name of that server . here we have to consider a member for a load balancer by certain make which receive inbound traffic and manages that traffic

## 2.5 Distribution of inbound traffic Farms and pool

Organization distribute in bound traffic among the backend processing point by taking help of load balancing so we have to discuss back end processing point this are refer as backend cluster this cluster are useful to access servers on several host points.

## 2.6 Servers in virtual form

The term virtual server at one time widely used and debated at on time here the traditional pairing of IP and Port number so different make uses virtual servers in load balancing architecture.

## 2.7 Increasing efficiency in network by using network traffic Manager

The LTM(Local Traffic Manager) high end server performance through high performance and flexible application delivery among the different commercial product available in market today BIG-IP local traffic manager by F5 Inc is leading company today to manage traffic in load balancing approach in cloud infrastructure to manage high availability with security feature and leading role in cloud environment LTM enhanced the page load time the positive change in human experiences this will manage by real time protocols it also include add on module to enhance the experiences

In the view of cloud computing BIG-IP LTM is associated with F5 scaleN technology associated with it that offers expanding nature of network to load demands this gives the facility to cloud computing infrastructure to quickly application and performance needs unavailability in peak load period gives damage to cloud service providers the role LTM is to provide services to manage the load by allowing bandwidth control it provide scalable network availability in all circumstances.

## 2.8 Job of access policy manager (APM)

With wide increasing use of internet in global world business and community not restricted of large amount of data now a days nonprofit organization are permit to explore their in-house data to outside world and allow to access their application without any old system barrier within and outside world also users which are accessing that application remotely are permissible to access the information without any authentications so there is need of we have to implement the system which centrally control the accessing the data securely and efficiently BIG F5inc offer centrally access policy manager to provide secure solution and high performance that will provide unified global access any application within the cloud computing infrastructure BIG-IP are well to manage access policy management it provide toolkit to manage all access in well manner .

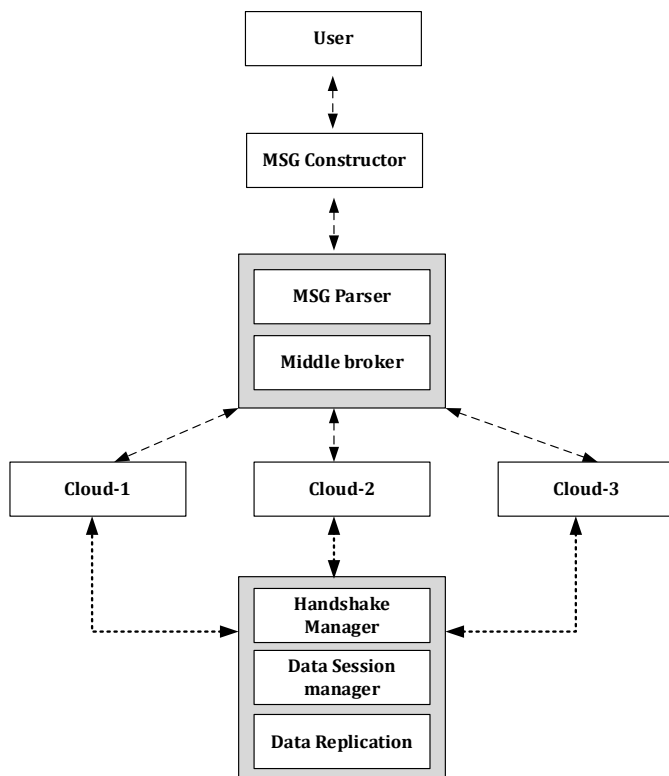


Figure: block diagram of BIG-IP access policy

## 2.9 Cloud infrastructure models

Infrastructure as a service:

As virtualization is the base of cloud computing the data abstraction service is for cluster of connecting servers and network hardware as virtualization allow hosting of application on one server with the help of infra as a service all servers and application easily access, file storage system, operating software, network infrastructure to setup their own infrastructure in this approach delivery model cloud computing services in load balancer virtual network and load balancer offers on demand service.

## Platform as a service

This is used to deploy a software developer a web based application without setting up the installation packages this make efficient use of time and management of resources such as platform operating system application renewal on annual contract basis and for software developer it will available in annual, monthly an hourly basis use of services

## Software as a service

It is the most popular service of cloud computing most common are Google docs Microsoft 365 with only functional feature is offered so any user can access the cloud computing software in this case end user does not know how that software installed on which hardware so end user is concerned about the application only .

## 3. Related work

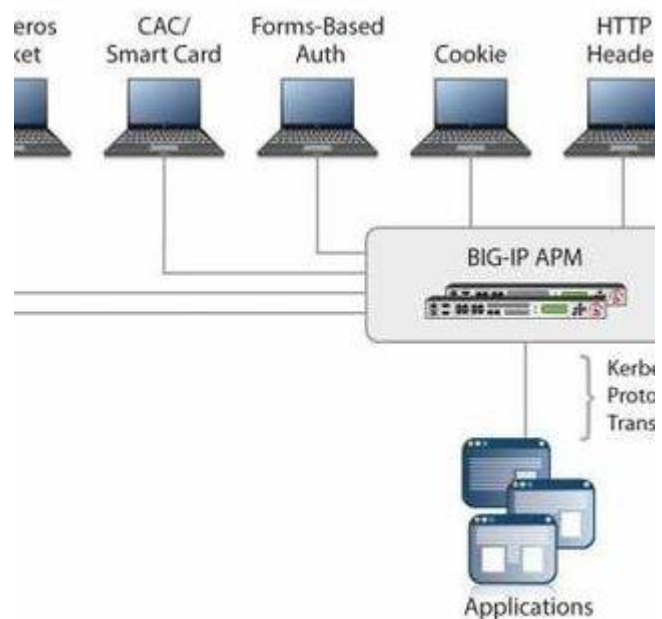
In our research existing work become sample security and performance of e-commerce application we included the SSL impact on this application request and response time research

result shows that client response time is rising from 0.1 seconds to 06 seconds cost request and response time is on an average 40 percent the factor consider in related work such as throughput cache size no of processor and network size in network load file access size in another research s found that the maximum output suing SSL and combination of cryptographic algorithm in some another finding the web server engage 90 percent of their time in handling HTTP request in this paper we suggest the cluster base load balancing scheme where incoming request is handled by the centralized system BIG-IP is the essential component in cluster based load balancing scheme.

## 4. Proposed work

In this research work we point to application which is hosted on cloud in secure environment we uses BIG-IP gateway in IaaS environment for our experiment we introduce the virtual world we uses the two BIG-IP boxes for our experiment for our study in remote client and application server we place BIG-IP we use SSL and VPN connection in cloud computing for information processing securely in our proposed work LTM APM and HA technique used

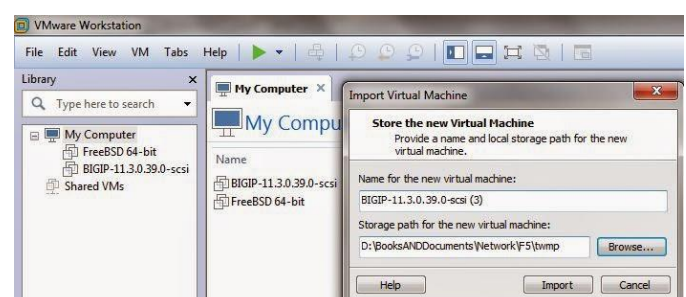
Fig. proposed layout of LTM and APM



## 5. Application Setup

Our propose system will handle 100 concurrent users  
Load balancing scheme handle 100 concurrent users  
Supports HA with active users  
Configuration changes will handle applications

Fig 4 installation of f5.ovf file



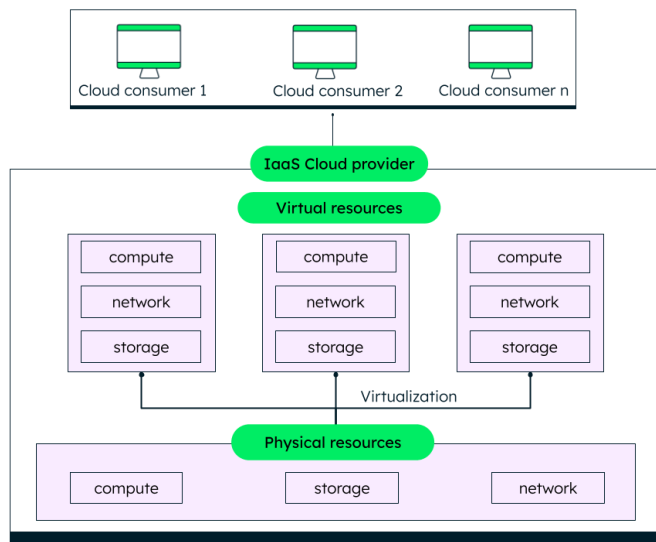


Fig 5. Installation of IaaS deployment

## 6. Result analysis

Virtual server is always presented and access to client side we can connect 100 users simultaneously to verify maximum output result shows performance

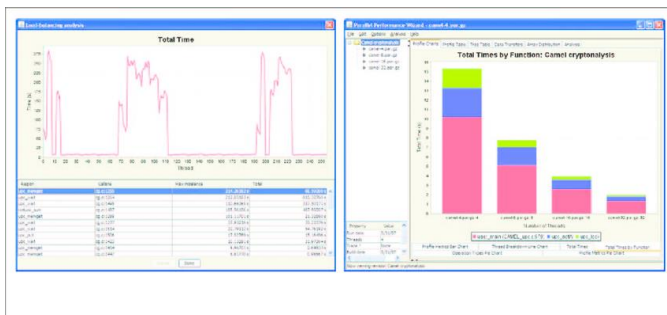


Fig7 throughput analysis graph

## 7. Conclusion

Security and performance balancing is the major concern in commercial venture in cloud computing environment BIG-IP solution is used for our application and leading technology in LTM and APM techniques in our solution we adopt the novel approach that we design access policies for security for example web application policy create dynamic access (ACL) connections.

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