ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

CCTF-RQ FRAMEWORK: COMMAND AND CONTROL TRAFFIC FLOW WITH RESOURCE QUEUING IN CLOUD INFRASTRUCTURE

[1]DURAIRAJ, [2]CHANDRASEKAR
[1]Research scholar, Department of Computer Science, Karpagam University, Kollegala Main Road, Coimbatore, Tamil Nadu, India
[2]Associate Professor and Reader, Department of Computer Science, Periyar University, Salam, Tamil Nadu, India.
E-mail: [1]durairaj.moorthy@gmail.com, [2]ccsekar@gmail.com

ABSTRACT

Cloud infrastructure interact with different components ensuring traffic free environment for both the simple and complex traffic and provide services to different type of vendors. Most previous studies conducted using prediction based resource management aim at providing resources to the user using statistical model that measure the traffic flow required for the future. However in practice it is not effective to provide appropriate resources using predictive analysis as it does not take into account the complex traffic pattern. In addition, prediction framework in cloud zone is much less compact for the business persons as it does not follow the dynamic flow generation part. Methods for controlling the traffic in cloud using virtualization based cloud data centers called as VMPlanner used the stepwise optimization approach. The approach, VMPlanner failed to incorporate certain level of links redundancy, where the communication latency was achieved during the data flow, but resulted in network failures. In this paper, a framework called Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) is presented to facilitate business persons eventually with dynamic data flow in cloud zone. The framework, CCTF-RQ works well by obtaining the prior knowledge about the server and the client system on the cloud for easy analyze of flow correlations. The proposed framework, CCTF-RQ clusters the similar configuration of server and client systems on the cloud and significantly solves the complex traffic occurring on user communication patterns. Further, in cloud environment certain level of link redundancy may deteriorate the network. We address the problem by clustering exactly the similar command control traffic patterns in cloud zone followed by which the session gets established to access the network without any communication latency. An efficient algorithm called Banker's Safety algorithm is developed to overcome the network failures during data flow. CCTF-RQ Framework on cloud zone is implemented with CloudSim in JAVA and experiment is conducted on the parametric factors such as Server response time, CPU utilization for correlation analysis, Mean Absolute Percentage Error, Traffic rate.

Keywords: *Cloud Infrastructure, Command and Control, Resource queuing, Banker's Safety algorithm, Server Configuration, Network Resources.*

1. INTRODUCTION

Cloud application communicates in a cooperative manner between the clients and occasionally depends on the other deployed applications for producing the traffic flow correlation result. Cloud computing offers a profitable environment by providing low cost and scalable form of client request. Even though the commercial cloud services have been converted into the public clouds, the increasing interest of constructing private cloud on cloud computing also exist with the help of many tools. The tool allows local users to have flexible and agile private infrastructure to run service workloads surrounded by their executive domains.

In cloud computing, a cloud is a cluster of distributed computers providing on-demand computational resources to the remote users over a network. The Infrastructure-as-a-Service (IaaS) in cloud provides resources to the users in the form of lease. Cloud computing is positioning itself as a new and hopeful platform for delivering

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

information infrastructures and resources as business services. VMPlanner as described in [2] for network power reduction in the virtualization-based data centers optimize both the virtual machine placement and traffic flow routing so as to turn off as many unneeded network elements as possible for power saving. But the VMPlanner failed in incorporating certain level of links redundancy, where the communication latency was improved during the data flow, but resulted in network failures.

A virtual infrastructure model called as the Nefeli, as studied in [10] provided certain levels of deployment mode for the possible mapping of virtual machine (VM) with the nodes. The deployment mode of VM included the collocation and anti-collocation of virtual machine but did not cover the scalability factor in large infrastructure. Verifiable computation (VC) as described in [17] permits a computationally weak client to outsource the evaluation of a function on many inputs to a powerful un-trusted server but affect the applications in outsourcing PIR. The verification computation scheme were only verified in a private manner and also included the privacy preserving that were publicly checked.

Privacy preserving scheme with simple abstraction on each MapReduce job was represented in [7] as a pair of map and reduced stage durations. The representation was in a way similar to that of the typical Johnson algorithm designed specifically for constructing an optimal two-stage job schedule. Experiments conducted on MapReduce proved that the computation cost related to the model was very high. Another model designed for high degree of virtualization based on the arrival of the tasks in batch mode in cloud centers in [19] but the model also resulted in the minimization of performance due to the occurrence of heavy workload observed at each nodal point. The performance analysis of cloud computing incorporates a high degree of virtualization, batch arrival of tasks and usually distributed service time.

Many-Task Computing (MTC) users as expressed in [4] make use of the loosely coupled applications and MTC batch arrivals to obtain their technical goals. The storage and network of workloads occur with different characteristics and requirements. With the increasing population of cloud users in MTC, the problem occurs during the optimization of the application with cost-performance and also trade-off being observed in security aspects. In the online context as illustrated in [12], NP-Complete make sense to compare the algorithms based on their cost. The variance made by the client during the allocation is of the form of minute small additive resource management for the server to identify the polynomial time.

Third Party Auditor (TPA) cloud client as described in [6] verify the integrity of the data stored in the cloud and resource allocation. The most capable one is a model in which public verifiability is achieved which does not permit TPA to audit the cloud data storage without extracting the time and resources of the users. In case of the external TPA, the integrity of data stored is verified on behalf of the cloud using the homomorphism authenticator which is in the form of public key using privacy preserving public auditing. The severity laid on the privacy of both the client and monitoring the service providers significant property in [18] could minimize the wide application of the mHealth technique but the designing of CAM are not based on these resource measurement models.

Prediction-based resource measurement and provision policy as illustrated in [1] using Neural Network and Linear Regression assure the upcoming resource demands. The machine learning techniques, adopted here, are some of the most common and popular ones in time-series analysis. Prediction-based methodology is able to predict the most likely future outcome based on recent resource usage and historical data. Prediction framework in cloud zone fails to facilitate business persons eventually with the dynamic flow generation part.

In this work, Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) is designed to develop an effective communication in the cloud zone. The framework of CCTF-RQ consists of the prior knowledge about the server and the client system which includes the host id and name of the server and client system. The CCTF-RQ framework initially clusters the similar activity followed by the command clustering and control clustering that controls the traffic occurred on the server system in cloud. Then the resource queuing establishes the session to access the network resources without any communication latency. Finally Banker's Safety (BS) algorithm in CCTF-RQ framework uses the command and control clustering to overcome the network failures in the cloud infrastructure.

Journal of Theoretical and Applied Information Technology
10th October 2014. Vol. 68 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

The structure of paper is as follows. In Section 1, describe the cloud computing and network traffic congestion occurred on the cloud data center. In Section 2, illustrates the Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) framework in cloud infrastructure. Section 3 explains about the CloudSim simulator in JAVA. The experimental factors are also explained through table and graph in Section 4. Section 5 explains about the related work carried out in the cloud infrastructure. Finally concludes the CCTF-RQ Framework in cloud data center with experimental result percentage.

2. FRAMEWORK OF COMMAND AND CONTROL TRAFFIC FLOW WITH RESOURCE QUEUING

The main objective of Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) is to eventually fetch the information from the cloud zone. To start with, the framework of CCTF-RQ contains prior information about the system configuration of different server and clients in cloud environment. The framework of CCTF-RQ then clusters and resource queuing process is introduced to reduce the traffic in the cloud network area. The architecture diagram of CCTF-RQ is shown in Fig 1.

Cloud Computing with the framework of CCTF-RQ developed with the application, platform, and infrastructure form service providers. The server system in cloud zone contains the server host id, name, request message and delivered messages. Likewise, client system also gets the information about the client host id, client name, message requested, delivered messages with configuration type obtained from the server for easy analyzing of the traffic in the data flow over the cloud network. The framework of CCTF-RQ contains one or more client's configuration information with provisional facilities in cloud data center.

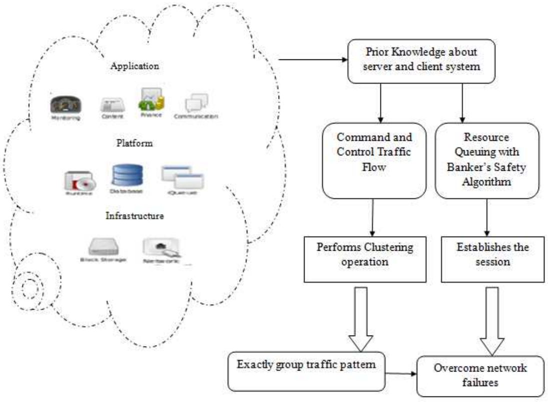

Fig 1 Architecture Diagram for CCTF-RQ

(a)

Server Host id	Name	Request message	Delivered message

(b)

Client Host id	Client Name	Request message	Configuration Type	Delivered message

Fig 2 (a) Server Information (b) Client information in Cloud Data center

To start with, the Command and Control Traffic Flow specifically cluster similar configuration type of clients. The clients using the Command and Control Traffic Flow are very effective in identifying the traffic flow correlation. The Command based clustering in CCTF-RQ uses the cluster concept of the client business system with similar activities. Control based clustering is performed to control the traffic flow while the request is being sent from the client to server business system.

In the second part of work, Resource Queuing creates the session for initial accessing of the resources from the server cloud data center. The Resource queuing uses the Bankers Safety (BS) algorithm. Also, the BS algorithm in CCTF-RQ handles maximum resource information to cover the complex traffic occurring on user communication patterns. By inserting session at each runtime, and applying the Banker's Safety algorithm for deadlock (i.e.,) traffic avoidance to achieve better resource utilization is achieved and overcome the network failures.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

2.1 Command and Control based Clustering

Command and control based clustering in CCTF-RQ Framework cluster the similar behavior (i.e.,) request of activities from the users.

2.1.1 Command based clustering

The command based clustering in CCTF-RQ clusters the client business system with similar activity flow. The connection from different client system to single server (i.e.,) different sources point to destination in cloud, but the service request in that cluster remains the same. In order to find the group of hosts that share similar communication user patterns, the clustering technique applied in CCTF-RQ is given as below,

$$\overrightarrow{UP_i} = FC(Cluster_i) \qquad (1)$$

Where $Cluster_i$ denotes the 'i'th cluster where i= 1,2,3…n. The user pattern vector $\overrightarrow{UP_i}$ contains the flow correlation for each cluster group. The user pattern vector representations in CCTF-RQ aim at finding significant request data points from a specified cloud space 'S'. The framework of CCTF-RQ use the competitive learning concept to perform the command based clustering. The competitive learning concept in cloud data center is explained through algorithmic steps.

Begin Competitive learning
Step 1: Let us assume i= 1, 2, 3…n to be the set of normalized input vectors on the cloud data center, with the weight assigned to be $w_1, \ldots, w_k$ for each business client request which ranges up to 'k' request.
Step 2: Initialize the threshold value=0
Step 3: Select the vector i_n€ I randomly
Step 4: *Compute* $i_n.w_k$ together
Step 5: Classify similar activity flow from the users
Step 6: Threshold value assigned based on normalized weight vector computation
Step 7: Continue with updation.
End

Fig 3 Algorithmic Step of Competitive Learning

The algorithm step continues until the request from the user pattern is clustered based on the competitive learning concept in the cloud data center. The command based clustering with competitive learning concept in cloud data center in CCTF-RQ initialize the threshold value with zero. The weight vectors of the each client request in cloud input space act effectively to cluster the similar activities. The competitive concept easily cluster and continue the updating easily till the end of the process in the cloud data center is achieved.

2.1.2 Control based clustering

The second step in the design of CCTF-RQ framework continues with the Control based clustering which is performed to control the traffic flow while the requests are sent from the client to server business system. The idea is to cluster the requests based on the traffic finding-check and to accordingly control the traffic occurring on the cloud data center. Initially the threshold score value is evaluated in the CCTF-RQ to support the client system by removing the traffic occurrence on the cloud data center.

$$\text{Threshold Score value} = i.(i_n * w_k)$$
$$= (i * i_n).(i * w_k) < 0 \qquad (2)$$

Wher i_n denotes the cluster activities with 'i' representing the number of clients in that clustered group. The dot product operation is performed on the control based clustering of CCTF-RQ framework to easily check the traffic occurrence space in the cloud data center. The weight of the each business client request is also computed with client count to evaluate the overall threshold value. The hosts that have a score below the threshold score value are used to check out the traffic occurring while the request are sent from the client to server business system.

$$Traffic\ Control = \sum_{i=1,2,3\ldots n} [w(Cluster\ 1_i), w(Cluster\ 2_i)$$
$$w(Cluster\ n_i) \cup \overrightarrow{UP_i}] \qquad (3)$$

Eqn (3) cluster (i.e.,) union the user communication pattern with the obtained threshold weight value to easily control the traffic in the cloud data center. The objective of the CCTF-RQ framework is to improve the server response rate in such a way that each client request continues to make good forward progress without traffic occurrence on the cloud data center.

As a result, the Command and Control makes an effectual network traffic control clustering for cloud computing in CCTF-RQ. Cloud computing recently received considerable attention in CCTF-RQ Framework, as a promising approach for delivering network traffic services by improving the utilization of cloud data centre resources in section

Journal of Theoretical and Applied Information Technology
10th October 2014. Vol. 68 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

2.2 with the application of Banker's Safety Algorithm.

2.2 CCTF Resource Queuing

The third step in the design of CCTF-RQ framework is to establish the session for accessing the resources effectively in the data cloud center with the help of an interactive system based on client request queuing. In order to establish the resources in an effective manner, the framework of CCTF-RQ uses Banker's Safety algorithm to gain the maximum resource information to mitigate the complex traffic pattern occurring during the user communication. After clustering in CCTF-RQ framework, session initialization is shown in Fig 4.

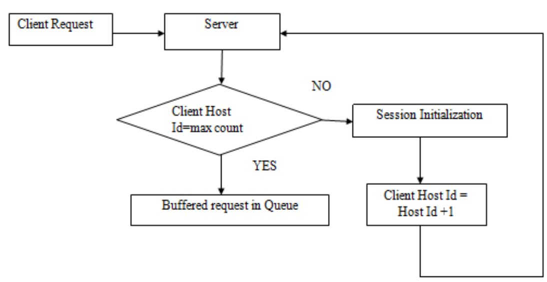

Fig 4 Session Initialization in CCTF-RQ Framework

Fig 4 describes the session initialization process involved in the design of CCTF-RQ framework followed by which the client request and server response is made effectively through session initialization. During the first stage in CCTF resource queuing the client submits the request to the server for session initialization. If the client host id is of maximum count then the client request is buffered in the queue of the data cloud center. Otherwise, the session is newly created. Followed by this the client host id is increased by 1, at each time the new session is created. The client host id is also decreased by 1, at each time the existing session is terminated from the cloud zone. The request information from the client in CCTF-RQ framework is sent to the server system of cloud infrastructure to access the network resources without any communication latency.

The framework of CCTF-RQ uses Banker's Safety (BS) Algorithm to overcome the network failures by avoiding the deadlock in cloud data center. The resource information in the form of matrix specifies the requirement of resources in advance to run the specific client request in the server. Bankers Safety Algorithm in the design of CCTF-RQ is given as below,

// Banker's Safety Algorithm

Input: Vector of Queue Length 'm' and cluster 'n'

Output: Network Traffic Avoidance in cloud data center

Step 1: Matrix form m*n

Step 2: Queue Length, let the command and control clustering be vector points of m*n

Step 3: Let the Queue Length = Client Request, where Clustering =1,2,3…n

Step 4: If Client Host Id=max count

Step 5: Buffered request in Queue and alter the matrix count

Step 6: Else Initialize Session

Step 7: Client Host Id =Host Id +1

Step 8: End If

Step 9: Queue Length = Queue Length+ Information of Client System

Step 10: Goto Step 3, continue update

Step 11: If clustering [i] = threshold score value, then the cloud data center is in safe state without deadlock.

Step 12: End If

BS algorithm handles the maximum resource information to cover the complex traffic occurring on user communication patterns. By inserting session at each runtime, and applying the Banker's Safety algorithm for deadlock (i.e.,) the traffic avoidance is achieved and results in better resource utilization and also overcome the network failures in cloud data center. The command and control traffic flow based clustering of each client request based on normalized weight is used to easily avoid the network failures in the cloud data center. In CCTF-RQ framework, the Banker's Safety algorithm has the potential to improve the cloud communication according to the business user request.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

3. CCTF-RQ EXPERIMENTAL SETUP

The framework of Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) perform experimental evaluation in JAVA platform using CloudSim simulator. The CloudSim simulator toolkit is chosen as a simulation platform as it is a present simulation structure in Cloud environments. Experimental machine is simulated with cloud data center comprising of 4 GB RAM of storage in client machines. The users need for effective communication is provisioned with the assorted Virtual Machine (VM) pack. Each VM runs a web-application of any kind with variable business based query request from client, which is modeled to generate the utilization of bandwidth according to uniformly distributed random variable.

The goal of CloudSim is to provide a generalized and extensible simulation framework on the cloud data center with the server and client systems that enables to model, simulation, and experiment on CCTF-RQ Framework. The framework of Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) is compared against the existing prediction based resource measurement, and VMPlanner. The experiment is conducted on the factors such as Server response time, CPU utilization for correlation analysis, Mean Absolute Percentage Error, Traffic rate and communication latency rate.

Server response time factor in CCTF-RQ framework measures the amount of time taken on the client request actions. The client request action is satisfied by the server in the cloud data center in terms of seconds (sec). The CPU utilization in CCTF-RQ refers to the computer's usage of processing client request with the help of cloud resources. Actual CPU utilization varies depending on the amount and type of managed computing tasks in the cloud data center and measured in terms of Mega Bytes (MB). Certain tasks in CCTF-RQ framework require heavy CPU utilization while others require less depending on the cluster count.

$\text{CPU utilization in CCTFRQ}$ = Cluster count*Size of the command cluster ……… Eqn (4)

Mean Absolute Percentage Error (MAPE) in CCTF-RQ framework is a measure of accuracy for constructing fitted time series specifically during the server estimation that expresses the error in percentage, and is defined by the formula as,

$$\text{MAPR} = \frac{100}{n}\sum_{t=1}^{n}\left|\frac{\text{Actual value} - \text{Predict Value}}{\text{Actual Value}}\right| \quad (5)$$

'n' denotes the iterations. Actual value is the expected system actual result percentage whereas the predicted value denotes the percentage value attained. Traffic control rate defines the actual monitoring of the client system request on the clouds zone. The traffic is controlled in high percentage in CCTF-RQ framework whereas the communication Latency denotes the delay during the communication of the server system with the client in the cloud data center. Latency rate is measured in terms of latency (i.e.,) delay percentage.

4. RESULT ANALYSIS OF CCTF-RQ FRAMEWORK

Command and Control Traffic Flow with Resource Queuing (CCTF-RQ) Framework is compared against the existing Prediction based Resource Measurement (PRM), and VMPlanner. The evaluation given below through table and graph describes the CCTF-RQ Framework in cloud data center to improve the communication level by overcoming the network failures.

	PRM System	VMPlanner	CCTF-RQ Framework
10	437	388	349
20	555	453	423
30	646	578	512
40	625	557	526
50	745	629	555
60	841	735	622
70	966	859	752

Table 1 Tabulation of Server Response Time

Journal of Theoretical and Applied Information Technology
10th October 2014. Vol. 68 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

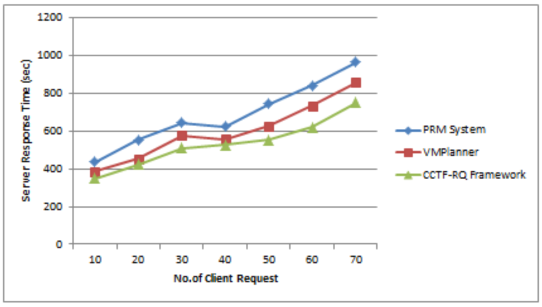

Fig 5 Measure of Server Response Time

Fig 5 describes the server response time based on the client request. In CCTF-RQ Framework, Control based clustering is performed to reduce the time taken to respond to the client request. The idea is to cluster the request based on the traffic finding-check and reduces by 15 – 26 % when compared with the PRM System [1] and 5 – 15 % when compared with VMPlanner [2]. Also the threshold score value support the client system by removing the traffic occurrence on the cloud data center.

Table 2 Tabulation for CPU Utilization

Cluster Count	CPU Utilization (MB)		
	PRM System	VMPlanner	CCTF-RQ Framework
2	14	11	10.5
4	34	30	28
6	70	65	62
8	110	100	96
10	175	160	150
12	235	211	204.2
14	315	293	280

CPU utilization is measured based on the cluster count. The tabulation for CPU utilization of the PRM System, VMPlanner and CCTF-RQ Framework is illustrated in table 2.

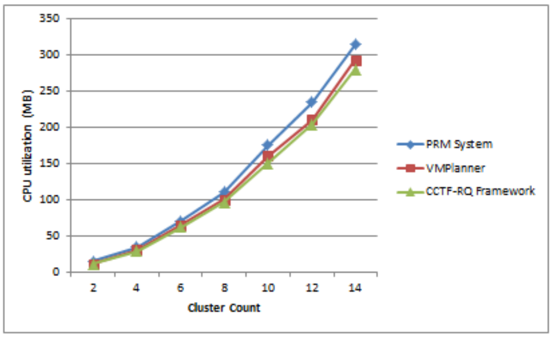

Fig 6 CPU Utilization Measure

Fig 6 describes the CPU utilization based on the cluster count. In CCTF-RQ Framework, the Resource Queuing creates the session for initial accessing of the resources between the client and the server cloud data center. As a result the CPU utilization is reduced by 11-25 % when compared with PRM System [1]. Also the Resource queuing uses the Bankers Safety (BS) algorithm that further reduces the rate of CPU utilization by 4 -6 % when compared with the VMPlanner [2]. BS algorithm handles the maximum resource information to handle the more complex client business requests.

Table 3 Tabulation of Mean Absolute Percentage Error

No of iterations	Mean Absolute Percentage Error (Error %)		
	PRM System	VMPlanner	CCTF-RQ Framework
10	0.35	0.28	0.25
20	0.66	0.55	0.43
30	1.05	0.89	0.7
40	1.78	1.57	1.4
50	2.25	2.12	1.8
60	2.95	2.56	2.2
70	3.89	3.12	2.8

Journal of Theoretical and Applied Information Technology
10th October 2014. Vol. 68 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

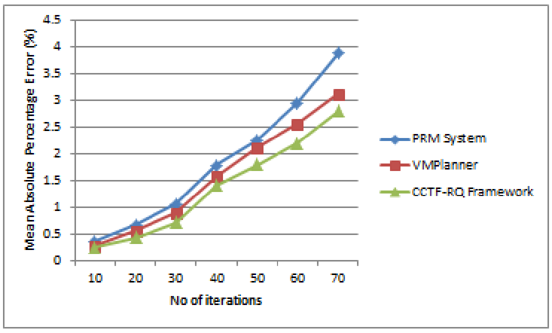

Fig 7 Performance of Mean Absolute Percentage Error

Fig 7 presented the mean absolute percentage error on PRM System, VMPlanner and CCTF-RQ Framework with respect to the number of iterations in the range 10 to 70. With the application of Command based clustering in the framework of CCTF-RQ with competitive learning concept in cloud data centers reduce percentage error by 20 – 34 % when compared with PRM System [1]. The weight vectors of the each client request in cloud input space act effectively to cluster the similar activities and reduce by 10 – 21 % error than the VMPlanner [2]. The competitive concept easily clusters the requests of the similar client and continues the updating easily by reducing the percentage error in the cloud data center environment.

Table 4 Tabulation For Traffic Control Rate

Client Systems	Traffic Control Rate (%)		
	PRM System	VMPlanner	CCTF-RQ Framework
5	75	72	80
10	76	73	81
15	76	74	82
20	77	75	83
25	79	78	84
30	79	78	85
35	80	79	88

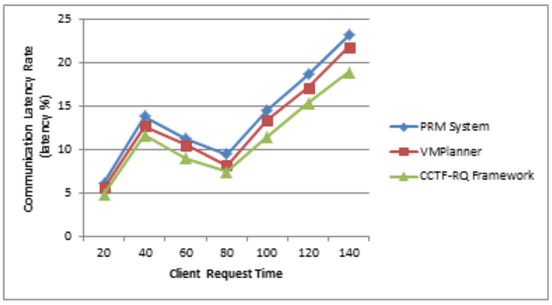

Fig 8 Traffic Control Rate Measure

Traffic Control rate of PRM System, VMPlanner and CCTF-RQ Framework is shown in Fig 8 with respect to the client systems ranging from 5 to 35. The user communication pattern with threshold weight computed value easily controls the traffic in the cloud data center. The resultant aim of the CCTF-RQ Framework is that it improves the server response time so that each client request continues to make good forward progress without traffic occurrence on the cloud zone. Eqn (3) is used to easily compute the traffic control rate. The traffic control is improved by 6 – 10 % when compared with the PRM System [1] and 7 – 10 % improved when compared with the VMPlanner [2].

Table 5 Tabulation Of Communication Latency Rate

Client Request Time	Communication Latency Rate (latency %)		
	PRM System	VMPlanner	CCTF-RQ Framework
20	6.12	5.55	4.85
40	13.85	12.7	11.6
60	11.20	10.54	8.95
80	9.42	8.12	7.45
100	14.54	13.45	11.45
120	18.66	17.18	15.39
140	23.22	21.86	18.91

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

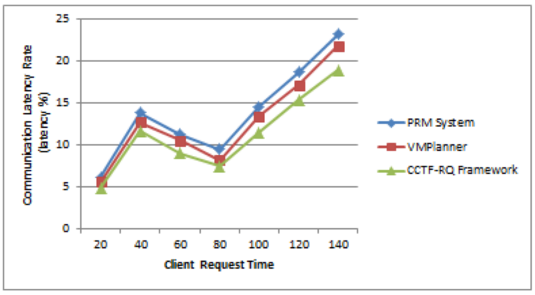

Fig 9 Performance of Communication Latency Rate

Fig 9 presented the communication latency based on the client request time. The client communication latency is measured on the interval of 20 seconds. The session establishment in the CCTF-RQ framework reduces the latency in communication by 16 – 21 % when compared with the PRM System [1]. The client host id is increased by 1, at each time the new session is created. The session creation reduces the delay rate and communicates effectively by 8 – 15 % improved when compared with the VMPlanner [2].

As final point, the Control Traffic Flow with Resource Queuing developed an effective communication system by controlling the traffic flow. CCTF-RQ framework initially clusters similar activity on the command clustering. CCTF resource queuing establish the session to access the network resources without any communication latency.

5. RELATED WORK

Cloud computing is a paradigm that shifts the particulars from the cloud users to the technology infrastructure who no longer need knowledge. It describes a newer consumption of resources and delivery model for information technology services based on Internet. It also acts as a computing capability that provides an abstract between the computing resources such as server, storage, networks, applications, services and its fundamental technical architecture. It requires the provisioning of scalable virtualized computing resources as a service over the internet. Trustworthy Resource Scheduling in Clouds as described in [14] assure with the users that their virtual resources are hosted using the physical resources. At the same time it also sees to that it is equivalent to users' requirements without their involvement with understanding the details of the cloud infrastructure. Resource scheduling fails in establishing trustworthy collection and calculation of the other properties.

Fine-grained access control on sensitive data as illustrated in [5] assured the trust (i.e.,) confidentiality of the data. The data from the cloud preserved the privacy of users who were approved to access the data. The option choices for the Two Layer Encryption (TLE) approach planed to further reduce the computational cost by exploiting partial relationships among Access Control Policies (ACP). Event Sequence-Based Test Cases [15] automatically generated the test cases on ACP. Classification was not performed on these dominant events.
But the current treatment of termination events, failed that resulted in additional verification contexts.

Security-mediator (SEM) as presented in [3], which is able to generate verification metadata (i.e., signatures) on outsourced data for data owners but decouples the secrecy safety mechanism from the Provable Data Possession (PDP). PDP not only minimizes the computation and bandwidth requirement of this mediator, but also reduced the trust located on it in terms of data privacy and individuality privacy. Collaborative PDP scheme adopted the techniques of homomorphism demonstrable responses in [9] and hash index hierarchy for the production of tags with the length unrelated to the size of data blocks.

The reason behind the failure was that the combined design system was not combined with the Hadoop platform. Classification Using Correlation Information is not exclusive on the non-TCP traffic. Rapid Prototyping of middleware architecture [13] provided the developer with services for runtime verification. AmI applications do not make interactions with technology-rich environments.

Two online dynamic resource allocation algorithms as described in [8] for the IaaS cloud system with pre-emptable tasks regulated the resource allocation dynamically. The resource allocation was based on the updated information of the actual task executions. In addition, IaaS cloud failed to investigate the implementation in the real-world cloud computing platform.

Hybrid Data Center Networks (DCN) solution utilized wireless transmissions as described in [20] to solve the congestion problem caused by a few

Journal of Theoretical and Applied Information Technology
10th October 2014. Vol. 68 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

hot nodes in the real-world cloud computing platform. The nodes improved the global performance by considering both the wireless interference and the adaptive transmission rate. A model-free hybrid reinforcement learning (RL) approach as illustrated in [16], combined the advantages of Simplex method and RL method to additionally improve the use of system knowledge guided privacy exploration policies.

Time-series Pattern based Noise Generation Strategy (TPNGS) for privacy protection on cloud in [11] initially analyzed the privacy risk. A novel cluster based algorithm produced time intervals dynamically based on these time intervals with corresponding probability fluctuations. Lastly, forecasting algorithm, presented to endure the probability fluctuation privacy risk. TPNGS failed to protect customer privacy to threat noise obfuscation.

6. CONCLUSION

CCTF-RQ facilitates business persons eventually with dynamic data flow in cloud zone. The idea is that each cloud data center contributes to effectively communicate based on the business user request in the cloud infrastructure. CCTF-RQ framework performs the command and control clustering to easily control the traffic on the client request to server system in cloud. The session establishment performed on the CCTF-RQ access the network resources without any communication latency. Resource queuing introduced in CCTF-RQ with Banker's Safety algorithm overcome the network failures in the cloud infrastructure. The experimental study results obtained using the framework of CCTF-RQ in CloudSim simulator attain the minimal time response from server and 15.043 % maximal CPU utilization for correlation analysis. The Mean Absolute Percentage Error is reduced in CCTF-RQ framework by using the BS algorithm. CCTF-RQ framework is an effective system in cloud data center and is also efficient from other related existing systems.

REFRENCES:

[1] Sadeka Islam., Jacky Keunga., Kevin Lee., Anna Liu., "Empirical prediction models for adaptive resource provisioning in the cloud," Future Generation Computer Systems., Elsevier Journal., 2012
[2] Weiwei Fang., Xiangmin Liang., Shengxin Li., Luca Chiaraviglio., Naixue Xiong., "VMPlanner: Optimizing virtual machine placement and traffic flow routing to reduce network power costs in cloud data centers," Computer Networks., Elsevier journal., 2012
[3] Boyang Wang., Sherman S. M. Chow., Ming Li§, and Hui Li., "Storing Shared Data on the Cloud via Security-Mediator," ACM CCSW, 2011
[4] Alexandru Iosup., Simon Ostermann,Nezih Yigitbasi., Radu Prodan., Thomas Fahringer., and Dick Epema., "Performance Analysis of Cloud Computing Services for Many-Tasks Scientific Computing," IEEE TPDS, MANY-TASK COMPUTING, NOVEMBER 2010
[5] Mohamed Nabeel., Elisa Bertino., "Privacy-Preserving Fine-Grained Access Control in Public Clouds," IEEE Computer Society Technical Committee on Data Engineering, 2012
[6] JACHAK K.B., KORDE S.K., GHORPADE P.P. AND GAGARE G.J., "HOMOMORPHIC AUTHENTICATION WITH RANDOM MASKING TECHNIQUE ENSURING PRI-VACY & SECURITY IN CLOUD COMPUTING, "BIOINFO Security Informatics ISSN: 2249-9423 & E-ISSN: 2249-9431, Volume 2, Issue 2, 2012
[7] Abhishek Verma., Ludmila Cherkasova., and Roy H. Campbell., "Orchestrating an Ensemble of MapReduce Jobs for Minimizing Their Makespan," IEEE TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING, APRIL 2013
[8] Jiayin Li., Meikang Qiu., Zhong Ming., Gang Quanc., Xiao Qin., Zonghua Gue., "Online optimization for scheduling preemptable tasks on IaaS cloud systems," Journal Parallel Distribution Computing, Elsevier journal., 2012
[9] YAN ZHU., and SHANBIAO WANG., "SECURE COLLABORATIVE INTEGRITY VERIFICATION FOR HYBRID CLOUD ENVIRONMENTS," International Journal of Cooperative Information Systems Vol. 21, No. 3 165–197. DOI: 10.1142/S0218843012410018, (2012)
[10] Konstantinos Tsakalozos., Mema Roussopoulos., and Alex Delis., "Hint-Based Execution of Workloadsin Clouds with Nefeli," IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 24, NO. 7, JULY 2013
[11] Gaofeng Zhang., Xiao Liu., and Yun Yang., "Time-Series Pattern based Effective Noise Generation for Privacy Protection on Cloud," IEEE TRANSACTIONS ON COMPUTERS., 2012

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[12] Olivier Beaumont., Lionel Eyraud-Dubois., and Hejer Rejeb., "Heterogeneous Resource Allocation under Degree Constraints," IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS., 2012

[13] Antonio Coronato., and Giuseppe De Pietro., "Tools for the Rapid Prototyping of Provably Correct Ambient Intelligence Applications," IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, VOL. 38, NO. 4, JULY/AUGUST 2012

[14] Imad M. Abbadi., and Anbang Ruan., "Towards Trustworthy Resource Scheduling in Clouds," IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 8, NO. 6, JUNE 2013

[15] Xun Yuan.,and Atif M Memon., "Generating Event Sequence-Based Test Cases Using GUI Run-Time State Feedback," IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, VOL. X, NO. X, JANUARY 2010

[16] Xiangping Bu., Jia Rao., Cheng-Zhong Xu., "Coordinated Self-configuration of Virtual Machines and Appliances using A Model-free Learning Approach," IEEE Transactions on Parallel and Distributed Systems, (Volume:24 , Issue: 4), 2013

[17] Liang Feng Zhang., and Rehanehi Safavi-Naini., "Private Outsourcing of Polynomial Evaluation and Matrix Multiplication using Multi-linear Maps," arXiv:1308.4218v3 [cs.CR] 3, 2013

[18] Huang Lin., Jun Shaoy., Chi Zhangz., Yuguang Fang., "CAM: Cloud-Assisted Privacy Preserving Mobile Health Monitoring," IEEE Transactions on (Volume:8 , Issue: 6), Information Forensics and Security, 2013

[19] Hamzeh Khazaei., Jelena Misic, and Vojislav B. Misic., "Performance of Cloud Centers with High Degree of Virtualization under Batch Task Arrivals," IEEE TRANSACTION ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. X, NO. Y, 2012.

[20] Yong Cui., Hongyi Wang., Xiuzhen Cheng., Dan Li., and Antti Yla-Jaaski., "Dynamic Scheduling for Wireless Data Center Networks," IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS