ABSTRACT:
Cloud computing trusts on resource sharing and distribution of on-demand services through remote access. The reimbursements of cloud has its impact in the business and educational institutions. The rural folk can cherish quality education at affordable cost with the hybrid cloud set up. A hybrid educational cloud frame work is proposed for rural educational institution. A software renting service to the rural education contented the end users with the quality-of-service. The QoS of hybrid cloud is preserved by predicting the workload pertaining the cloud. The proposed work creates a hybrid cloud set up with automated resource management. The lower level load metrics are used to determine workload of the cloud. The scheduler calculates the current load status of the machine. A genetic algorithm based decision engine utilizes the current load status and makes optimized decision. The optimized decision safeguards the SLA and ensures high quality in the hybrid cloud set up. CloudSim renders the cloud infrastructure for experimenting and simulating the results.

INTRODUCTION:
The cloud computing has great impact in the rural education. The rural educational institution differs in the way that the urban promises necessary infrastructure and quality education. One third of our country is rural folks who hallucinate for value education. Most of the rural institution aches from poor admission due to the migration of rural folks towards urban quality education which upheavals the entire country progress. The trend can be relinquished by providing higher end education to the rural as the one in urban. The academic institutions with the affordable cost cannot provide quality education especially in the rural segment. Branded academic environment for rural wards is conceivable with upper commercial rate. In general, this brings a lot of stress in the rural households creating disparity in education. In most cases, the rural students are enforced with inferiority complex. This objectionable trend can be exterminated by improving the quality of education in the rural areas. A set up where the cloud computing implementation could face most difficult of situations can be recognized. The primary aim of the work is to deliver customized educational knowledge to the rural wards. The research could be extrapolated to optimize the way for spreading knowledge free of cost. This thought has similarities to optimum way to feed the hungry rather than the negative thought of help offered free will be taken for granted and misused in the long run. Through knowledge for free via cloud computing, we intend to provide knowledge, only when it is needed in a customized way, yet with a great amount of freedom to utilize it for productive purposes. Software renting for free may require tremendous amount of cooperation among existing stakeholders and powerful humanitarian organizations. The idea still has merit when implemented to the fullest extent possible. Software renting for free – Sounds like an anomaly but that is the way it needs to be implemented in order to quantify the amount of value addition that is being provided. Our hybrid cloud provides an orderly fashion of implementation through which scaling the operation up or down could be enabled.

A hybrid educational cloud frame work shown in Fig 1 is the solution for the dissemination of knowledge. The established cloud based data centre [L11] encompasses virtualized resources and administrative applications. The end users’ access the cloud, their access rights to a particular operating system or software is controlled, by the administrative applications in the private cloud data centre. They could run resource draining tasks utilizing the private cloud datacentre’s computing and storage spaces. This shows that the end user is taken to the provider’s technical set up, as soon as he connects through his client machine’s web browser.
The implementation of the Educloud should be thoroughly tested and standardized for appreciation. Hybrid cloud data centres are main stream in most enterprises. Regarding security of hybrid cloud, the security of sensitive information matters. The sensitive information may be related to any field. Educloud do not relate sensitive information to begin with. This hybrid cloud implementation provides software renting service to the rural institution. The efficacy of the Educloud can be appreciated if the service provisioning capacity is satisfactory. Though the cloud technology provides satisfied service provisioning capacity, the end user can be contented with the performance of the cloud. QoS is the ultimate factor that regulates the performance of the cloud. It needs to be upheld in order to quantify the amount of value addition that is being provided. It would also help in performance-metrics collection, and compare the various regions on a knowledge measuring scale, analyse their requirements and upgrade the knowledge provider requirements. Multiple end users targeting the hybrid cloud fixes the performance of the cloud. The varying workload of the application when overlooked degrades the performance of the entire system. The performance degradation progressively has its waves in the Quality-of-Service. The catastrophe to preserve the QoS has domino effect in loosing end users. The workload though unpredictable should bring about to conserve the QoS. The cloud providers should adapt a load balancer for managing the workload of the cloud. The major role of resource provisioning is to distribute the available resources efficiently to the end users. The cloud load balancer analyse the request traffic and makes decision on resource provisioning. The performance of the cloud environment can be progressively improved by the cloud balancer by concentrating on resource allocation and on the scheduling process.

RELATED WORK:
A hybrid cloud comprises of collection of massive resources. The critical task for the cloud provider is to convey a layout for managing these resources. The end users can be satisfied with system uptime, reliability and scaling. However, application layer quality-of-service (QoS) cannot be guaranteed by most of the systems. In Q-Cloud [L2] MIMO model captures the performance interference interaction. The underutilized resources are dynamically provided for the application that suspects multiple levels of QoS. The system efficiency is improved by closed loop resource management scheme. Multiple network architecture over a common infrastructure can be attained through network virtualization [L3]. A new virtual network with admission control guarantees SLA negotiation. The two-layered QoS model creates challenges in multi-domain scenarios. Future networking has sound support in semantic methods [L3]. QoS ontologies provide efficient horizontal resource handling for heterogeneous network. Still it needs to be developed for the growing technology. The varying load can be scheduled with Elastic Load Balancing [21] scheme and resource utilization can be optimised. Threshold based resource allocation [33] maintains higher resource utilization and scalability with dynamic scaling algorithm. The approaches using analytical modelling [25] and machine learning [27], [28] utilize the output of certain algorithm for optimal resource allocation. The QoS maintenance in these approaches are through workload adjustment which possibly will violate SLA as fine-tuning drives on. The analytical model and machine learning approaches require substantial time [17] and the accuracy [L8] of the approaches need to be carefully examined.

PROPOSED WORK:
A hybrid cloud environment runs distributed applications providing certain functionality. Amongst enormous applications consecutively on the cloud no application need the entire resources at all time. Most business applications routines automated resource management for resource provisioning in a distributed environment. The automated resource management scheme is dependent on predicting the crowning workload of the applications. Predicting the peak workload of cloud applications is dreadfully challenging owing to the characterisation of dynamically varying workload in short-time variations. The overwhelming request hollows the automated resources management schemes to outage. The fluctuating workload enforced for large measures of decisions. The outage decision upsets the QoS [46]. The Qos is safeguarded in the proposed method by dynamically adjusting the virtual machine instances. Resource provisioning decisions are made at runtime in a single adaptation time. The resource provisioning and the adaptation time reduction is accomplished by the succeeding phases

1. The workload and the resource prerequisite of the hybrid cloud learned periodically.
2. Continuously monitoring the performance of the Educloud. A slight degradation in the service noted resolved by reconfiguring the resource provisioning.

The load metrics of the cloud environment can be categorised as low level metrics and upper level metrics [37]. Some application when they are computing intensive ingests higher CPU utilization however makes less network traffic, storing more run time data and log files. The varying metrics constituted as upper level metrics. The attempt of gathering the upper level metrics creates overhead to the intact arrangement since it varies from application to application. The low level metrics such as CPU, memory usage and bandwidth responsible for determining the workload of the cloud are application independent. Load metrics are collected, load status of the cloud and resource allocation is reconfigured using current status and existing knowledge. The metrics like cpu utilization, bandwidth, latency collected using top, vmstat and systat in Linux operating system is depicted in the figure 1.

The system’s current load status normalizes the resource provisioning using multi agent genetic algorithm which takes action to change the resources allocation rate depending on the current performance status of the system. The resource allocation rate is calculated by RA = E(m) * fn [L9]. The estimated value E(m) is determined by calculating the difference between the vms allocated and the expected and the value fn can be any fixed number used by the selection engine. The proposed work is
simulated using cloud sim. CloudSim[L10] an extensible framework offers cloud infrastructure for the researchers to set up a hybrid cloud environment. The performance of the hybrid cloud can be finetuned by evaluating the simulated results. The simulation set up of the hybrid cloud embraces creation of data centre, data brokers, virtual machines and worklets as depicted in figure 2.

![Figure 2. Lower Level Metrics](image)

A optimized schedule decision is made by the decision engine with the current workload status calculated by the scheduler. The SLO is maintained and an accurate resource allocation is made by usage of genetic algorithm. The resource allocation is reconfigured by decision engine calculating the value. fitness = \( f(x) / f(\text{sum}) \). The knowledge of existing resource status and the metric are rewarded and updated in a knowledge table by a learning. Updation is made on the knowledge table on regular intervals which is utilized by the decision engine to adjust the resource allocation. The proposed algorithm is given as

```
for each Vmi in Vm
Vm_W = []

for each Vmi 1 to n in Vm[]
    fitness = fitness(Vmi)
    Vm_W.append((Vmi, fitness))
Vm1 = Max(Vm_W)
Vm2 = Max(Vm_W - Vm1)
Vm3 = crossover(Vm1, Vm2)
m mutate(Vm3)
Vm.append(Vm3)
Vm.remove(Vm1)
Vm.remove(Vm2)

mfit = fitness(Vm[0])
mfit_Vmi = Vm[0]

for Vmi in Vm
    fit_val = fitness(Vmi)
    if fit_val > mfit
        mfit = fit_val
        mfit_Vmi = Vmi
        print mfit_Vmi
```

**RESULTS AND DISCUSSIONS:**

A set of experiments to evaluate the workload traces of the virtual machine using cloudSim. The simulation set up collects the performance metrics of the VM at the system level without taking into account the actual application it works with. The current load status of each Vm created and the fitness value calculated and the suitable Vm are shown in fig 4., fig 5., and fig 6.
CONCLUSION:
A Multi Agent Genetic Algorithm and a novel resource management framework ensures high-level quality in the hybrid cloud computing system. The scheduler and decision engine used exploits the relationship between the resource allocation and performance. The SLO and performance can be maintained by optimized resource allocation. A strategy for provisioning resource using fitness value is implemented. The simulated results pave the way to perform the study using real world workload traces.

REFERENCES
13. Rodrigo N. Calheiros, Rajiv Ranjan, Anton Beloglazov, C’esar A. F. De Rose and Rajkumar Buyya. CloudSim: a toolkit for modeling and simulation of cloud computing environments and evaluation of resource provisioning algorithms. Published online 24 August 2010 in Wiley Online Library (wileyonlinelibrary.com), pp. 23-58