www.ijecs.in
International Journal Of Engineering And Computer Science ISSN:2319-7242
Volume 3 Issue 5 may, 2014 Page No. 5954-5959

Delivering Of Real Time Services through Internet Protocol Using Cloud Computing

[1]Nikshape S S, [2]Deepak S S

[1]PG Student Dept. Of CS&E, [2]Asst. Professor Dept. Of CS&E
[1,2]Acharya Institute of Technology, Bangalore-90
[1]Nikshapess@gmail.com, [2]Deepakss@acharya.ac.in

Abstract— **cloud computing is nothing but set of services and resources which are offered through internet. Using Cloud computing technology services can be delivered to the user by making use of the technique called virtualization. By making use of statistical multiplexing's virtualized cloud based services can yield significant cost savings across different applications. Achieving the similar cost savings with the real time services is a challenging task. In this paper we are looking for a lower provide costs for the real time iptv services through virtualized iptv architecture and intelligent time shifting of selected services.**

Here we are going to consider live TV and video on demand as applications and the deadline that has been associated with each of these two applications will be taken as an profit and effectively multiplexing both the services and a generalized framework will be provided to compute the amount of resources that are required to support multiple services without missing the deadline of any of the services. The problem is to find the best cost function of several cost functions and these cost functions reflect the amount of cost which is required to provide the service. Finding solution to the above problem gives the number of servers which are required at different time instants to support multiples / a multiple / the multiple services. We also implement a simple mechanism of time shifting of scheduled jobs of a simulator and study the reduction in the server load using real traces from an operational iptv network and results show that we are able to reduce the load as predicted by the framework.

Keywords—**Cloud computing, Real time services, efficient, Earliest deadline first, Virtualization.**

I. INTRODUCTION

Cloud computing is inherited from such as traditional computer technology, communication technology and business mode. It is based on the network and has the format of providing service to the consumer. Cloud computing system provides the service for the user and has the character of high scalability and reliability. The resources in the cloud system are transparent for the application and the user do not know were the resources are. The users can access your applications and data from anywhere the amount of resources provided in the cloud system for the users is increased when they need more and decrease when they need less. The resource can be the computing, storage and other specification service.

The majority of cloud computing infrastructure currently consists of reliable services delivered to data a center which is built on servers with different levels of virtualization technologies. Many companies provide the cloud computing platform such as Google, IBM, Microsoft, Amazon, VMware and EMC. Governance and security are crucial to computing on the cloud, whether the cloud system is in firewall or not. The security of cloud computing is the key important problem of the development of cloud computing. The traditional security mechanism cannot protect the cloud system entirely.

Cloud computing simply means Internet computing generally the internet is seen as collection of clouds , thus the word cloud computing can be defined as utilizing the internet to provide technology enabled services to the people and organizations . Cloud computing is independent computing it is totally different from grids / a grid / the grid and utility computing. Cloud computing is also known as utility computing, or IT on demand. For having good and high performance , cloud provider must meet several management features to ensure improving reliability , availability and security parameters of its service such as Availability management , Access control management , Vulnerability and problem management , Patch and configuration management , Countermeasure , Cloud system using and access monitoring .

Cloud computing is based on few attributes, multi-tenancy (shared resources) , massive scalability , elasticity , pay as you go , and self-provisioning of resources , security assessment , polices , physical security . It makes new advances in processors, Virtualization technology, disk storage, broadband Internet connection, and fast, inexpensive servers have combined to make the cloud a more compelling solution. The main attributes of cloud computing are illustrated as Follows

• Multi-tenancy (shared resources), Cloud providers always try to build its security to meet the higher risk clients and obviously all the lower risk clients get betters / bettered security.

• Massive scalability, Cloud computing provides the ability to scale to tens of thousands of systems, as well as the ability to massively scale bandwidth and storage Space.

• Elasticity, Users can rapidly increase and decrease their computing resources as needed.

• Pay as you used: Users to pay for only the resources they actually use and for only the time they require them.

• Self-provisioning of resources, Users self-provision resources, such as additional systems (processing capability, software, storage) and network resources. • Cloud computing can be confused with distributed system , grid computing , utility computing , service oriented architecture , web application , web 2.0 , Broadband network , browser as a platform , Virtualization , and free/open software . Cloud computing is a natural evolution of the widespread adoption of virtualization, service-oriented architecture, autonomic, and utility computing. Details are abstracted from end-users , who no longer have a need for expertise in , or control over , the technology infrastructure "in the cloud" that supports them as shown in figure 1.1

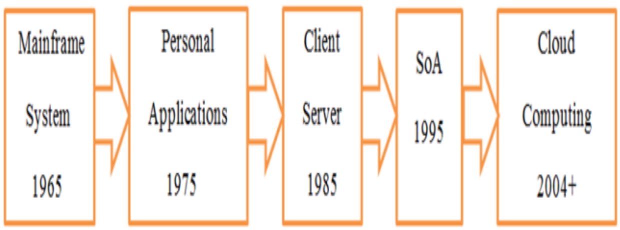


Fig. 1 Evolution of Cloud Computing.

Cloud services exhibit few essential characteristics that demonstrate their relation to , and differences from , traditional computing approaches such as On-demand self-service , Broad network access , Resource pooling , Rapid elasticity , and Measured service . Cloud computing often leverages Massive scale, Homogeneity, Virtualization, Resilient computing (no stop computing), Low cost/free software, Geographic distribution, Service orientation Software and Advanced security technologies.

A real-time application is typically composed of a number of cooperating activities, each contributing toward the overall goals of the application. The physical system being controlled dictates that these activities must perform computations within specific time intervals. For instance, safety considerations may dictate that an activity must respond to an alarm condition within several milliseconds of the receipt of the alarm signal.

Real-time applications usually contain more activities that must be executed than there are processors on which to execute them. Consequently, several activities must share a single processor, and the question of how to schedule the activities for any specific processor that is, deciding which activity should run next on the processor must be answered. Necessarily , a prime concern in making scheduling decisions on real-time systems are satisfying the timing constraints placed on each individual activity , thereby satisfying the timing constraints placed on the entire application .

Unfortunately, the activities to be scheduled are not independent. Rather, they share data and devices, observe concurrency constraints on code execution, and send .signals to one another. All of these interactions can be modeled as contention for shared resources that may only be used by one activity at a time.

For real-time applications and services, the timeliness is a major criterion in judging the quality of service. Due to the nature of real- time applications for the Internet, the timeliness here refers to more than the deadline guarantee as that for hard real- time systems. In this regard, an important performance metric for cloud computing can thus be the sum of certain value or utility that is accrued by processing all real-time service requests.

Ip based video delivery has become very popular recently. Content and service providers typically provision their resources for handling peak demands of each service across the subscriber population. However, provisioning for peak demands results in the resources being underutilized in all other periods.

Goal is to take advantage of the difference in workloads of the different IPTV services to better utilize the deployed servers. For example, service providers support both Live TV and Video-on-Demand (VoD) as part of the IPTV service. While VoD is delivered to unicast, Live TV is delivered over multicast. However, to support instant channel change (ICC) in Live TV, service providers send a short unicast stream for that channel. Compared to the ICC workload which is very bursty and has a large peak to average ratio, VoD has a relatively steady load and imposes less stringent delay requirements. By multiplexing across these services, we can minimize the resource requirements for supporting these combined services. We can satisfy the peak of the sum of the demands of the services, rather than the sum of the peak demand of each service when they are handled independently. This paper proposed a virtualized iptv architecture and through intelligent time shifting of selected services.

The rest of this paper is organized as follows. In Section II some of the scheduling algorithms have been discussed. In Section III describes the existing system. In Section IV the Proposed Architecture is discussed. In Section V Design and implementation. In Section VI obtained Conclusion.

II. SCHEDULING APPROACHES

Real time task scheduling determines the order in which the various task is taken for execution. No task is taken for schedule before its arrival time and the precedence and the timing constraints on all tasks are satisfied. In such a scenario, task scheduling algorithms play an important role where the aim is to schedule the tasks effectively so as to reduce the turnaround time and improve resource utilization. A real-time scheduler must ensure that processes meet deadlines, regardless of system load or make span. Priority is applied to the scheduling of these periodic tasks with deadlines. Every task in priority scheduling is given a priority to some policy, so that scheduler assigns tasks to resources according to priorities. A scheduler is called dynamic if it makes scheduling decisions on run time, selecting one out of the current set of ready tasks. A scheduler is called static if it makes scheduling decisions on compile time.

A non-pre-emptives / non-pre-emptied online scheduling for real time services with task migration algorithms to provide the solution to the task abortion when its misses the deadline . The execution of a task may get potential profit or potential loss. The penalty will degrade the overall computing performance.

Assurance-Driven UA Scheduling [5].Li's UA scheduling algorithms and protocols break significant new ground by providing more general assurances on timeliness behaviour of TUF/UA systems such as assurances on individual activity timeliness behaviour and system- wide, collective timeliness behaviour. Li's algorithms and protocols consider stochastic activity models, where activity execution times and inter-arrival times are stochastically described. In particular , the algorithms and protocols con- sider a stochastic , activity arrival pattern called PUAM , which is a probabilistic generalization of the uni-modal arrival model and which subsumes most traditional arrival models (e.g. , frame-based , periodic , sporadic , uni-modal) as special cases . The algorithms and protocols allow activities to be subject to uni-modal TUFs, and to mutually exclusively share non-CPU resources under the single-unit request model.

Li's approach includes off-line CPU bandwidth allocation, run-time scheduling, and run-time lock-based and lock-free resource access contention resolution. While CPU bandwidth allocation allocates CPU bandwidth share to activities, scheduling orders activity execution on the CPU. Li's lock-based resource access protocols resolve con tent ion among activities (at run-time) for accessing shared resources, and bound the time needed for accessing those resources. Li's bandwidth allocation algorithms , scheduling algorithms , and resource access protocols collectively pro- vide stochastic assurances on timeliness behaviour including probabilistically satisfied lower bounds on each activity's maximal utility , in addition to a lower bound on the sum of activities' maximal utilities , besides maximizing the summed utility.

Memory-Aware UA Scheduling [5]Feizabadi's MSA algorithm extends the TUF/UA paradigm in yet another critical , quality of service dimension for embedded systems , memory management . Embedded real-time systems are traditionally limited to main memory, static allocation, and dedicated fixed-size partitions, all of which contribute to predictability. However, dynamic memory allocation and dynamic, automatic memory deal- location (i.e., garbage collection) is highly attractive for dynamic, embedded real-time systems that worst-case memory requirements cannot often be statically estimated.

The MSA algorithm allows activities to be subject to uni-model TUFs, and to mutually exclusively share non-CPU. Consider the scheduling objective of maximizing the summed utility. Further, the algorithm allows memory to be dynamically allocated, which is considered as explicit scheduling points.

Utility. Further, the algorithm allows memory to be dynamically allocated, which are considered as explicit scheduling points.

TUF/UA Approach

The most distinguishing property of real time systems , however , is that they are subject to time constraints that are "soft" (besides hard) in the sense that completing an activity at any time will result in some (positive or negative) utility to the system , and that utility depends on the activity's completion time . These soft time constraints are subject to optimality criteria such as completing all time-constrained activities as close as possible to their optimal completion times so as to yield maximal collective utility. The optimality of the soft time constraints is generally at least as mission- and safety-critical as that of the hard ones.

Jensen's time/utility functions (or TUFs) allows / allowed the semantics of soft time constraints to be precisely specified. A TUF, which is a generalization of the deadline constraint, specifies the utility of the system resulting from the completion of an activity as a function of its completion time.

Non- pre-emptives / pre-emptived real time scheduling using check pointing algorithm [5].

It present a non-pre-emptives / non-pre-emptived real time scheduling using check pointing algorithms to provide the solution to minimizing the execution time of the migrated tasks . The execution of a task may get potential profit or potential loss. The penalty will degrade the overall computing performance. Checkpoint intervals will be allocated to the task with highest expected gain in the queue and ready for its execution. Whenever the task misses its deadline, the execution of the task will be aborted, it will be migrated to another virtual machine and start its execution from where the last checkpoint interval saved. Then the task which has the highest expected gain in the queue is allocated to checkpoint intervals and starts its execution.

Earliest Deadline First (EDF) algorithm [2].

Earliest-deadline-first (EDF) scheduling policy is the job closest to its deadline is to be served. The key EDF is a dynamic scheduling algorithm, the priority to a task can change from its execution. EDF has been proven as the optimal uniprocessor scheduling algorithm. This means that if a set of tasks are un-schedulable under EDF then no other scheduling algorithm can feasibly schedule this task set here we assume that period of each task are same as its deadline and the variant of EDF is minimum laxity first(MLF).

III. EXISTING SYSTEM.

There exist various tools and technologies for cloud, such as cable and Digital television (DTV) is a telecommunication system for broadcasting and receiving moving pictures and sound by means of digital signals, in contrast to analog signals in analog (traditional) TV. It uses digital modulation data, which is digitally compressed and requires decoding by a specially designed television set or a standard receiver with a set-top box.

IV. PROPOSED ARCHITECTURE

The proposed system is going to make use of statistical multiplexing for achieving similar savings with real time services. Here, we seek to lower a provider's costs for real-time IPTV services through a virtualized IPTV architecture and through intelligent time-shifting of selected services.

Using Live TV and Video-on-Demand (VoD) as examples, we show that we can take advantage of the different deadlines associated with each service to effectively multiplex services. We provide a generalized framework for computing the amount of resources needed to support multiple services, without missing the deadline for any service. We construct the problem as an optimization formulation that uses a generic cost function. We consider Multiple forms for the cost function (e.g., maximum, convex and concave functions) reflecting the cost of providing the service. The solution to this formulation gives the number of servers needed at different time instants to support these services. We implement a simple mechanism for time-shifting scheduled jobs in a simulator and study the reduction in server load using real traces from an operational IPTV network. Our results show that we are able to reduce the load by ~24% (compared to a possible ~31.3% as predicted by the optimization framework).

Describe a system where a digital television service is delivered using the Internet Protocol over a network infrastructure, which may include delivery of a broadband connection. For residential users, IPTV is often provided with Video on Demand and may be bundled with Internet services such as Web access and VoIP. The commercial bundling of IPTV, VoIP and Internet access is referred to as a Triple Play. Adding the mobile voice service leads to the Quadruple Play denomination. IPTV is typically supplied with a broadband operator using a closed network infrastructure. This closed network approach is in competition with the delivery of TV content of the public Internet. This type of delivery is widely called TV over Internet or Internet Television. In businesses, IPTV may be used to deliver television content of corporate LANs and business networks. Perhaps a simpler definition of IPTV would be television content that, instead of being delivered through traditional formats and cabling, is received by the viewer through the technologies used for networks

Advantages

- User easily buys the channel using internet.
- User receives the signal from set-top box.
- No wires needed.

The packets transmitted over an Internet link result from simultaneous active connections, each sending its packets as part of a communication among two or more hosts. The packets of the different connections are intermingled on the link for example; a packet is transmitted for one connection, then a packet for a second, another for the first, then two packets in a row for a third, and so forth. This intermingling is referred to as “statistical multiplexing” in the packet network literature and as “superposition” in the mathematical literature of point processes. We use the terms interchangeably here because we rely on both literatures.

Article treats the statistical properties of packet traffic and how the properties change with the magnitude of statistical multiplexing. We investigate the properties theoretically, invoking the mathematics of marked point Processes and we investigate the properties empirically, analysing measurements of traffic variables in 3026 packet traces from 6 monitors on Internet links ranging from 100 mbps to 622 mbps.

V. DESIGN AND IMPLEMENTATION

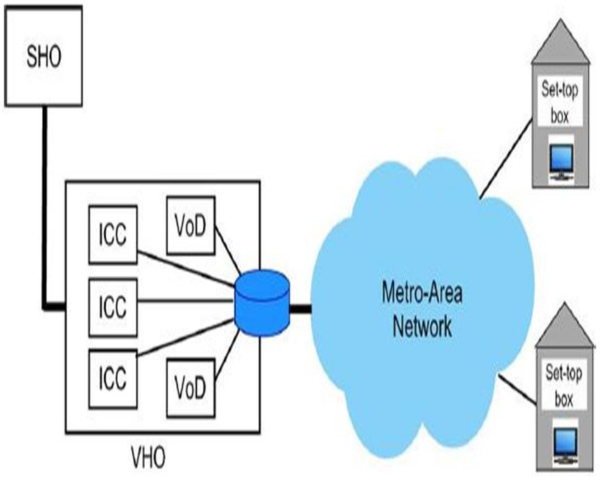


Fig. 2 Iptv Architecture.

The three tier architecture shown in the figure where user through set-top box via network access the cloud. An end to end logical architecture is shown in Fig. At the top of the hierarchy is the Super Head End Office (SHO) where both linear programming broadcast content and VoD content are acquired. Content acquired from the SHO is typically carried over an IP backbone network to each of the Video-Hub-Offices (VHO). The content goes to each home from the VHO via the metro-area network into each user's home and to their set-top box.

A sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence.

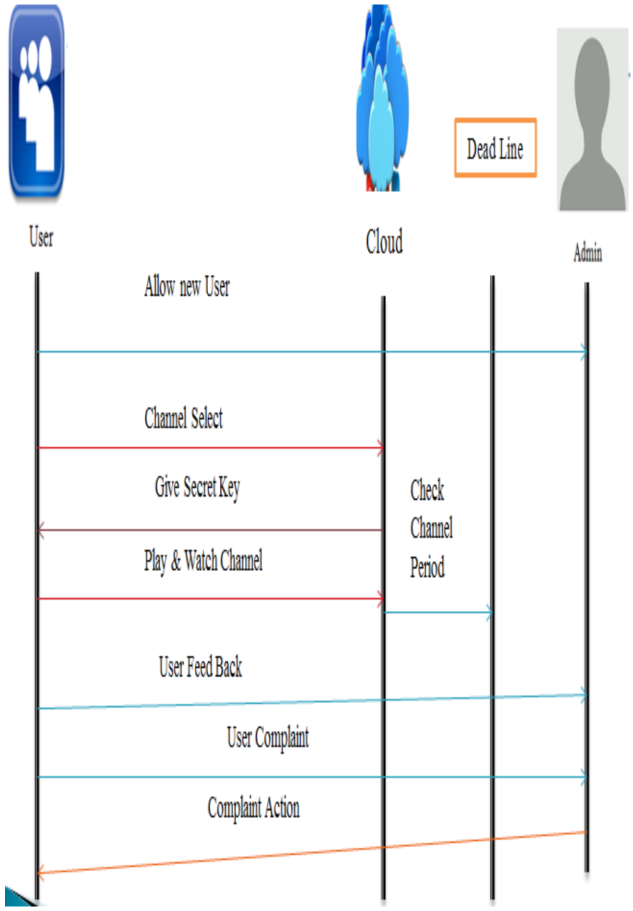


Fig. 3 Sequence Diagram.

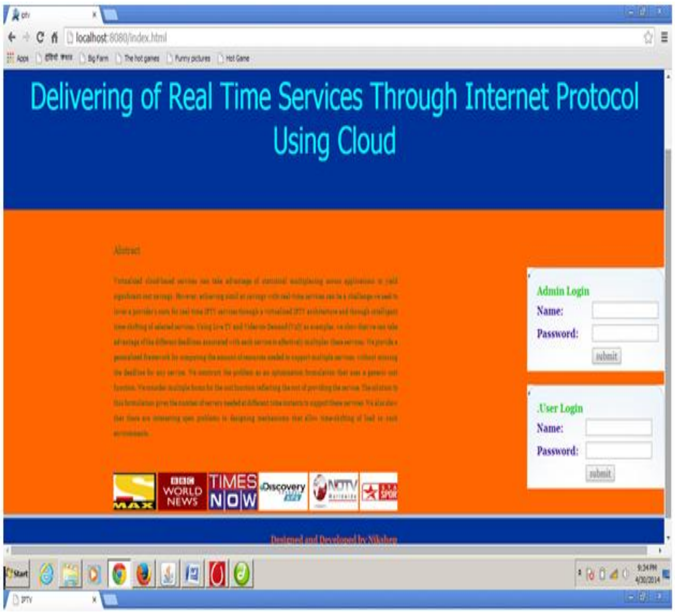
The design consists of 4 modules:

- Cloud Computing.
- Deadline Constraints and Scheduling.
- User Complaint.
- Optimization.

Among the 4 modules the first module describes about the characteristics of cloud computing. Second module describes about the deadline constraints and scheduling and third about user complaint and fourth about the optimization framework.

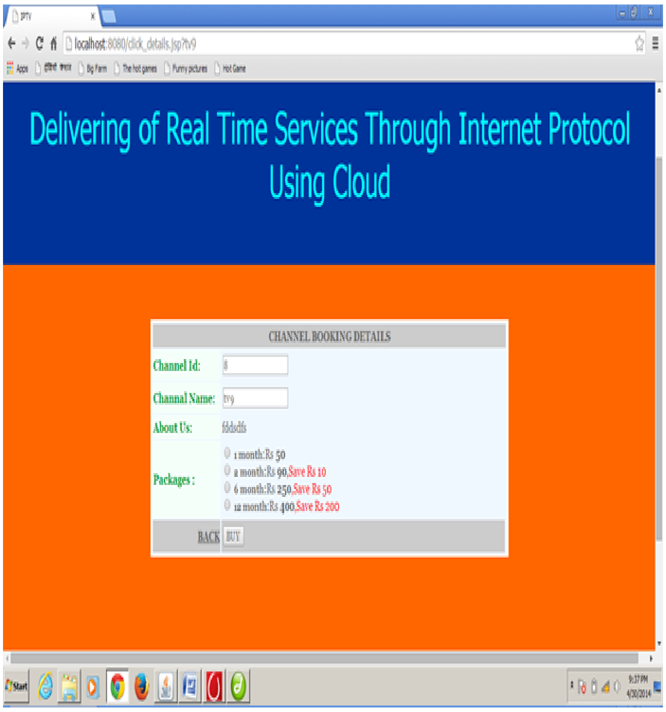
VI. RESULTS

1. Starting Window



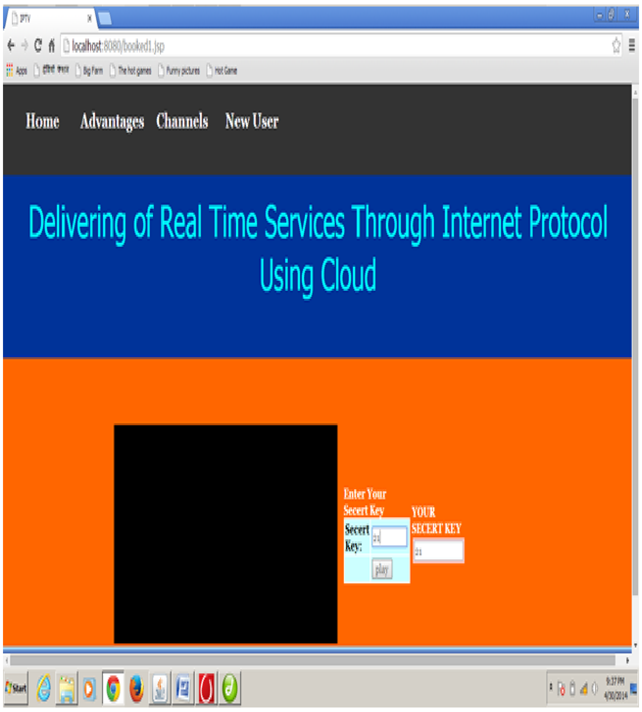
It shows login for admin as well as for the user.

2. User Channel Selection Window



It user can select whatever the channel and packages he wish to select.

3. Generation of Secret key



Here a secret key will generated using that secret key user can watch the selected channel.

4. Watching the Channel.

VII. CONCULSION

We came to know about how the iptv service providers combine virtualized cloud infrastructure and intelligently time-shifting load to better utilize deployed resources. We used live tv and video on demand as the examples of iptv services that can run on a shared virtualized infrastructure. This paper first provides a framework of computing resources required to support multiple services with deadlines. Secondly we formulated the problem of find the best cost function and computing the number of servers required based on the cost function. Thirdly we show two approaches from sharing resources, postponing and advancing VoD delivery. We show that in a realistic setting using simple mechanisms, the server load reduction is dependent on the duration of the adjustment i.e. burst window the number of jobs moved and the period over which they are averaged i.e. smoothing window. This paper does not consider storage of service as a part of cost function .so considering storage of service as a part of cost functions is the future work

REFERENCES

[1].”Optimizing Cloud Resources for Delivering IPTV Services Through Virtualization” Vaneet Aggarwal, Member, IEEE, Vijay Gopalakrishnan, Member, IEEE, Rittwik Jana, Member, IEEE, K. K. Ramakrishnan, Fellow, IEEE, and Vinay A. Vaishampayan, Fellow, IEEE.

[2].R. Santhosh Department of CSE Karpagam University T. Ravichandran Hindusthan Institute of Technology Coimbatore, India Proceedings of the 2013 International Conference on Pattern Recognition, Informatics and Mobile Engineering (PRIME) February 21-22 “Pre-emptive Scheduling of On-line Real Time Services With Task Migration for Cloud Computing”

[3].H. Wu, B. Ravindran, and E. Jensen (2004)., On the joint utility accrual model, pages 124.

[4].H.Wu, U. Balli, B. Ravindran, and E. Jensen (2005)., Utility accrual real-time scheduling under variable cost functions, Pages 213–219.

[5].] P. Li, H. Wu, B. Ravindran, and E. Jensen (2006)., A utility accrual scheduling algorithm for real-time activities with mutual exclusion resource constraints, Computers, IEEE Transactions on, 55(4):454– 469.

[6].“Real time task scheduling”, last chapter, Version 2, IIT Kharagpur.

[7] J. A. Stankovic,M. Spuri, K. Ramamritham, and G. C. Buttazzo, Deadline Scheduling for Real-Time Systems: Edf and Related Algorithm. Norwell, MA, USA: Kluwer, 1998.

[8]. V. Aggarwal, X. Chen, V. Gopalakrishnan, R. Jana, K. K. Ramakrishnan, and V. Vaishampayan, “Exploiting virtualization for delivering cloud-based IPTV services,” in Proc. IEEE Conf. Computer Communications Workshops (INFOCOM WKSHPS), Apr. 2011