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Enhancing Cloud Resources for Implementing IPTV Services using Virtualization

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ABSTRACT

Implementation of IPTV service delivery through Virtualization is of practical interest in many applications such as detecting an IPTV service delivery failure. The intrusion detection is defined as a mechanism for an IPTV service delivery through virtualization to detect the existence of inappropriate, incorrect, or anomalous moving attackers. In this paper, we consider this issue according to heterogeneous IPTV service delivery models. Furthermore, we consider two sensing detection models: single-sensing detection and multiple-sensing detection... we seek to lower a provider's costs of real-time IPTV services through a virtualized IPTV architecture and through intelligent time shifting of service delivery, 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. Our simulation results show the advantage of multiple sensor heterogeneous WSN IPTV service delivery through virtualization. We also show that there are interesting open problems in designing mechanisms that allow time-shifting of load in such environments.

Keywords: Internet protocol television, Interactive TV, Live TV, Instant channel change, Set Top Box, Video-On-Demand.

I. INTRODUCTION

Internet Protocol television is a system through which television services are delivered using the Internet protocol suite over a packet-switched network such as the Internet, instead of delivering through terrestrial, satellite signal and cable television formats.

As IPTV-based television becomes more popular, one of the biggest challenges service providers face today is to support users' voracious appetite for entertainment video across the various IPTV services (Live TV, Video on Demand etc). To cater to the different users and their needs, providers provision for the peak demands of each service. However, since the resource demands of none of these services is constantly or even concurrently at the peak, provisioning for the peak is sub-optimal.

In IPTV, Live TV is typically multicast from servers using IP Multicast, with one group per TV channel. Video-on- Demand (VoD) is also supported by the service provider, with each request being served by a server using a unicast stream. When users change channels while watching live TV, we need to provide additional functionality to so that the channel change takes effect quickly. For each channel change, the user has to join the multicast group associated with the channel, and wait for enough data to be buffered before the video is displayed; this can take some time. As a result, there have been many attempts to support instant channel change by mitigating the user perceived channel switching latency [1]. With the typical ICC implemented on IPTV systems, the content is delivered at an accelerated rate using a unicast stream from the server. The playout buffer is filled quickly, and thus keeps switching latency small. Once the playout buffer is filled up to the playout point, the set top box reverts back to receiving the multicast stream.

We seek to minimize the resource requirements for supporting the service by taking advantage of statistical multiplexing across the different services - in the sense, we seek to satisfy the peak of the sum of the demands of the services, [2] rather than the sum of the peak demand of each service when they are handled independently. Virtualization offers us the ability to share the server resources across these services.

II. LITERATURE REVIEWS

IPTV means delivering enhanced video applications over a managed or dedicated network via Internet Protocol.

In IPTV service, this technology is used as that of Internet Services. In this service the TV channels are encoded in IP format and delivered to TV using a Smart Electrical Electronic Device. The IP TV Service also includes Video on Demand cloud services which are similar to watching Video CDs / DVDs using a VCD / DVD/CD player. Movies, different channels, Instructional Videos and other content shall be available to customers in the IP TV Services. This IPTV through a broadband connection. IPTV is not video over the public Internet.

IPTV describes as multimedia services such as television/video/audio/text/graphics/data delivered over IP based networks managed to provide the required level of quality of service and experience, security, interactivity and reliability.

IPTV virtualization provides the following services:

1. Live TV
2. Video On Demand (VOD)
3. Interactive TV

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Interactive television is a form of media convergence, adding data services to traditional television technology.

In IPTV, there is both a steady state and transient traffic demand [3]. Transient bandwidth demand for LiveTV comes from clients switching channels. This transient and highly bursty traffic demand can be significant in terms of both bandwidth and server I/O capacity. The challenge is that we currently have huge server farms for serving individual applications that have to be scaled as the number of user's increases. In this paper, we focus on dedicated servers for LiveTV ICC and VoD. Our intent is to study how to efficiently minimize the number of servers required by using virtualization within a cloud infrastructure to replace dedicated application servers.

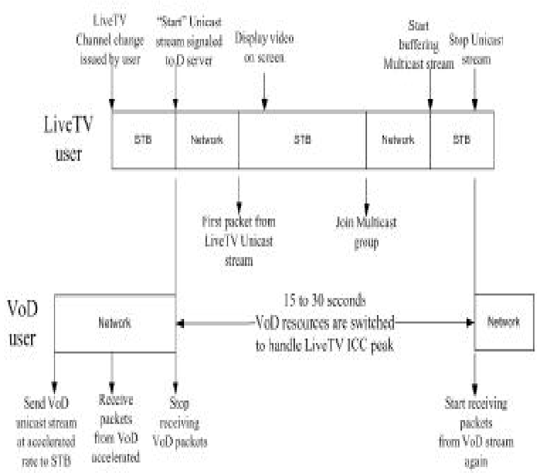

Fig 1: LiveTV ICC and VoD packet buffering timeline

When there are multiple services (in this context, VoD and LiveTV ICC) that coexist, and if some services have very high peak to average ratios, multiplexing can help to reduce the total resource requirements. LiveTV ICC is emblematic of such a service, with a large amount of correlated requests arriving periodically.

Working Principle

Optimization theory is a mathematical technique for determining the most profitable or least disadvantageous choice out of a set of alternatives. Dynamic optimization is a sub branch of optimization theory that deals with optimizing the required control variables of a discrete time dynamic system.

In this paper, we consider finite-horizon optimization where the optimal control parameters with finite look-ahead are to be found [4] [5]. More specifically, we know the arrival pattern of the IPTV and VoD requests with their deadlines in the future. We wish to find the number of servers to use at each time so as to minimize the cost function. In this paper, we consider different forms of cost functions. We derive closed form solutions where possible for various cost functions.

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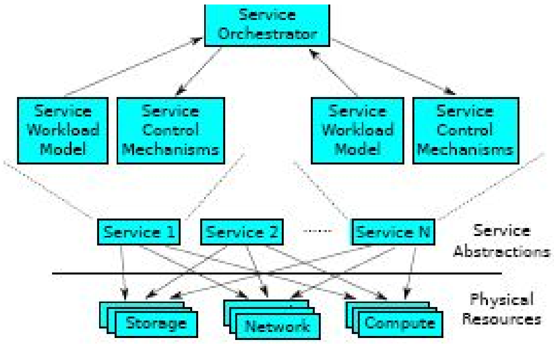


Fig 2 : Cloud IPTV architecture

III. IMPLEMENTATION

In our virtualized environment, ICC is managed by a set of VMs. The number of such VMs created would be driven by the predictor described above. (note that a small number of VMs would typically be assigned to each distinct channel). Similarly, for the VoD service, we would configure a number of VMs based on the currently active VoD sessions, and would be adapted to meet user demand. When a physical server complex is shared for these services, it is desirable that we minimize the total number of VMs deployed. Thereby the resources used to satisfy all these requests. The provisioning approach described above effectively uses virtualization to achieve this minimization of resource usage. Because VMs can be spawned quickly [2], the orchestration procedure exploits the prediction to do so in anticipation of an ICC load impulse. Furthermore, it causes the VoD VMs to serve existing sessions at a faster rate prior to the onset of the ICC load, and then quiesce these VMs during the ICC spike.

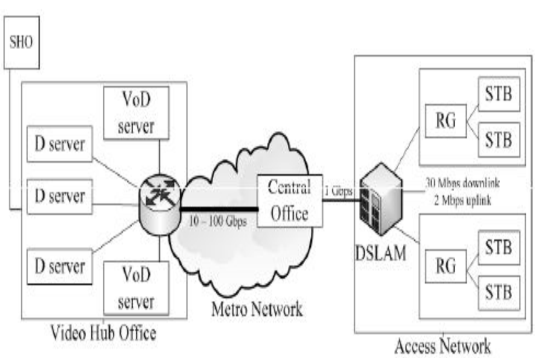
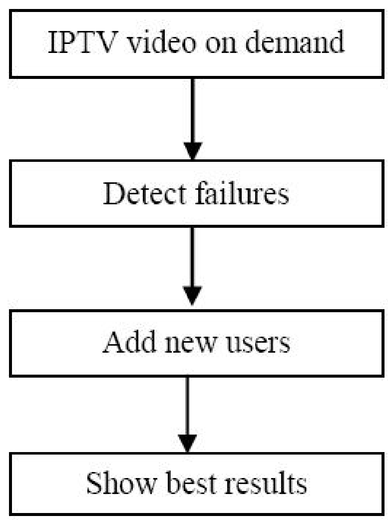


Fig 3 : Typical IPTV architecture



To check the availability and integrity of outsourced data in cloud storages, researchers have proposed two basic approaches called Provable Data Possession and Proofs of Irretrievability. Ateniese et al. first proposed the PDP model for ensuring possession of files on un-trusted storages and provided an RSA-based scheme for a static case that achieves the communication cost. They also proposed a publicly verifiable version, which allows anyone, not just the owner, to challenge the server for data possession. They proposed a lightweight PDP scheme based on cryptographic hash function and symmetric key encryption, but the servers can deceive the owners by using previous metadata or responses due to the lack of randomness in the challenges. The numbers of updates and challenges are limited and fixed in advance and users cannot perform block insertions anywhere.

IV. RESULT

In this section we presented results from a simple adjustment mechanism we implemented. Our results show that even our simple mechanism is able to give significant reductions in load. However, there is still room for improvement. We showed that the load reduction is dependent on the duration of the adjustment (burst window), the number of jobs moved and the period over which they are averaged (the smoothing window). Our results show that a particular value for each of these parameters is not the best across the board; instead the value chosen depends on the relative load of each of the services being adjusted. We believe that mechanisms to predict this relative load of each service and dynamically choose values for the parameters based on this prediction can yield further improvements. Designing such mechanisms is an opportunity for interesting future work.

V. SUGGESTION

Our experiments clearly demonstrated that our approaches only introduce a small amount of computation and communication overheads. Therefore, our solution can be treated as a new candidate for data integrity verification in outsourcing data storage systems.

Software will definitely undergo change once it is delivered to the customer. There are many reasons for the change. Change could happen because of some unexpected input values into the system. In addition, the changes in the system could directly affect the software operations. The software should be developed to accommodate changes that could happen during the post implementation period.

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VI. CONCLUSION

IPTV service providers can leverage a virtualized cloud infrastructure and intelligent time-shifting of load to better utilize deployed resources. Using Instant Channel Change and VoD delivery as examples, we showed that we can take advantage of the difference in workloads of IPTV services to schedule them appropriately on virtualized infrastructures. By anticipating the LiveTV ICC bursts that occur every half hour we can speed up delivery of VoD content before these bursts by prefilling the set top box buffer. This helps us to dynamically reposition the VoD servers to accommodate ICC bursts that typically last for a very short time. Our paper provided generalized framework for computing the amount of resources needed to support multiple services with deadlines. We formulated the problem as a general optimization problem and computed the number of servers required according to a generic cost function. We considered multiple forms for the cost function and solved for the optimal number of servers that are required to support these services without missing any deadlines. We implemented a simple time shifting strategy and evaluated it using traces from an operational system. Our results show that anticipating ICC bursts and time-shifting VoD load gives significant resource savings. We also studied the different parameters that affect the result and show that their ideal values vary over time and depend on the relative load of each service mechanisms as part of our future work.

VI. REFERENCES

[1] D. Banodkar, K. K. Ramakrishnan, S. Kalyanaraman, A. Gerber, and O. Spatscheck, “Multicast instant channel change in IPTV system,” in Proceedings of IEEE COMSWARE, January 2008.

[2] H. A. Lagar-Cavilla, J. A. Whitney, A. Scannell, R. B. P. Patchin, S. M. Rumble, E. de Lara, M. Brudno, and M. Satyanarayanan, “SnowFlock: Virtual Machine Cloning as a First Class Cloud Primitive,” ACM Transactions on Computer Systems (TOCS), 2011.

[3] D. Banodkar, K. K. Ramakrishnan, S. Kalyanaraman, A. Gerber, and O. Spatscheck, “Multicast instant channel change in IPTV system,” January 2008, proceedings of IEEE COMSWARE.

[4] L. I. Sennott, Stochastic Dynamic Programming and the Control of Queueing Systems. Wiley–Interscience, 1998.

[5] D. P. Bertsekas, “Dynamic Programming and Optimal Control,” in Athena Scientific, Blemont, Massachusetts, 2007.

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