



Embedding Cloud Computing in television broadcasting

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Abstract: With the significant advances in Information and Communications Technology over the last half century, there is an increasingly perceived vision that computing will one day be the 5th utility (after water, electricity, gas, and telephony). This computing utility, like all other four existing utilities, will provide the basic level of computing service that is considered essential to meet the everyday needs of the general community. To deliver this vision, a number of computing paradigms have been proposed, of which the latest one is known as Cloud computing.

In this situation compatibility of an old system into new system is all ways at its highest priority. So we aim at embedding the concept of cloud computing in television broadcasting. In this paper we explore the concept of cloud computing in television broadcasting. The channels will have their entire hardware distributed all over the globe which constitute the cloud. They are accessed virtually by all the users. In detail the cloud contains the channels, storage server, application server, clients. It will enable the user to access any channel and any program even if it is previously telecasted. It helps the small scale industries to establish their own firms. By this we bring an entirely new system that adds to the benefit of the user.

Keywords: Cloud computing, television, architecture, service providers, clients, servers

I. INTRODUCTION

Since the early era of mankind entertainment has been a basic human need. A lot of improvements are taking place in this field, starting from a gramophone to television. Interestingly, the entertainment advances are geared towards leveraging the Internet to cater to world-wide audiences. Most of the world is choosing internet as its entertainment tool. So why don't we use the latest trends in internet for television broadcasting. To achieve this we can use the concept of cloud computing.

In the present day broadcasting scenario television channels are using the electronic mode of communication i.e. a transmitter, satellite, receiver and so on. The prerecorded or the live telecast will be taking place using the above mechanism. Here the client will be accessing those telecasts. The service provider who mediates between the channel and the user provides him a wide range of signals among which he accesses only one channel at a time and only particular frequencies. Also he can't access the previous broadcasts. This limits the user choice.

Here we bring up a system where the client will be given highest priority, i.e. he can access every channel and also the previously broadcastings. In this new means of broadcasting we use the concept of cloud computing.

II. CLOUD COMPUTING

Cloud computing is a paradigm in which information is permanently stored in servers on the Internet and cached temporarily on clients that include desktops, entertainment centers, table computers, notebooks, wall computers, Hand held devices.

A typical cloud will consists of infrastructure, storage, platform, service, application, clients. These elements of the cloud may be wide spread over the entire the globe. There will not be any physical connection between them unlike conventional computing strategies. Internet establishes the link between them.

Cloud computing clients do not generally own the physical infrastructure serving as host to the software

platform in question. Instead, they avoid capital expenditure by renting usage from a third-party provider. They consume resources as a service and pay only for resources that they use. Many cloud-computing offerings employ the utility computing model, which is analogous to how traditional utility services (such as electricity) are consumed, while others bill on a subscription basis. Sharing "perishable and intangible" computing power among multiple tenants can improve utilization rates, as servers are not unnecessarily left idle (which can reduce costs significantly while increasing the speed of application development). Increased high-speed bandwidth makes it possible to receive the same response times from centralized infrastructure at other site.

Cloud storage is the feature that helps to store a huge amount of data virtually on the cloud without owning a storage device. Instead of owning the hardware one can rent the same from a cloud. This data can be accessed from any place.

Using these characteristics of cloud computing we derive a broadcasting cloud. In this cloud we provide telecasts of the channels as a service by the cloud and a database of all the telecasts will be in the cloud storage. So the previous broadcasts can be accessed by the client. This is called IT reusability. As we have the knowledge of cloud let us implement the same in television broadcasting.

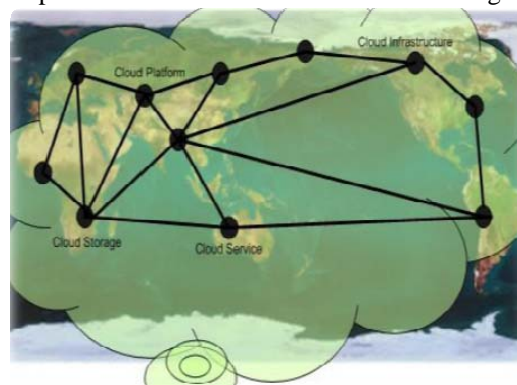


Figure 1. A typical cloud computing network

III. PRESENT SYSTEM

First, A one way communication is established between the channel and the user. The communication is done using a huge amount of hardware owned by each individual channel. Signals of different frequencies will be transmitted by different channels. They all will be transmitted to the satellite. This will be received by the local service providers(they can be cable or DTH providers). A wide band of frequencies will be received and depending on the channel the user tunes the particular channel will be viewed.

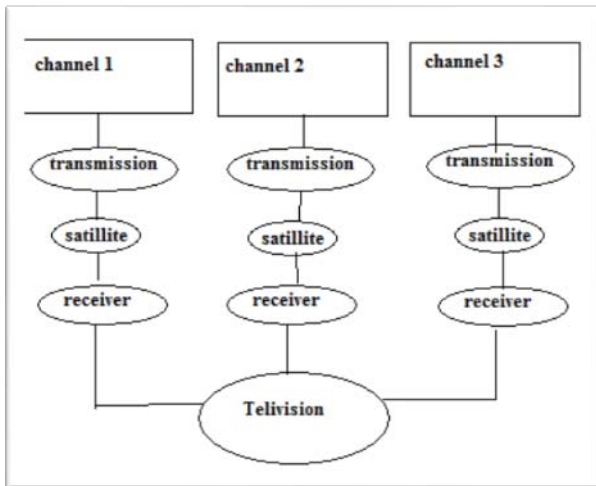


Figure 2. Present broadcasting architecture

In this system the user is given all the frequencies at his end and he has to tune to the particular frequency. He will all the time getting all channels irrespective of his present action. The user will be charged for the channels he will not be watching. This is because of lack of backward communication. This way of system is too expensive for a small scale industry to establish a new service. Using the clouding concept we can solve this problem.

IV. BACK END ARCHITECTURE OF BROADCASTING

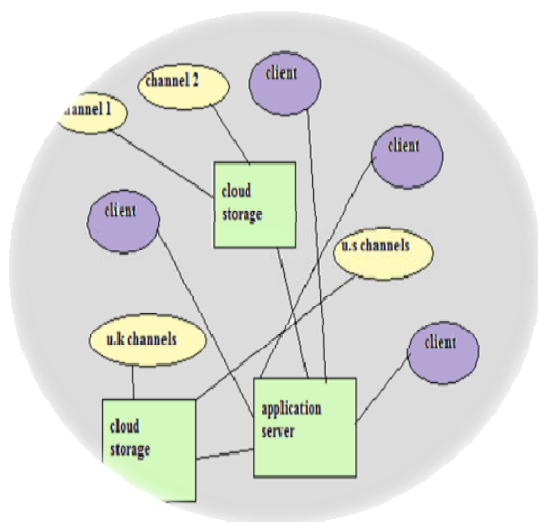


Figure 3. Broadcasting cloud

The broadcasting will consist of channels, storage units, cloud platform, clients. These will be spread over the entire globe. In this architecture we will establish a two way

communication. The service provider comes into picture at the back end itself.

The service provider will be the person providing the infrastructure. In this system the each channel need not have to own a separate hardware for the transmission to the client. An entire database of all the telecasts of a particular channel will be created in the cloud storage. This will be made available to all the clients for a longer time. In the similar fashion all the different channels across the globe will place there a in the server. This database will help client to access the telecasts that took place long Back. There will be communication established between the cloud platform and the client using a single frequency using the internet connection unlike the multiple frequency required for the conventional mode.

V. FRONT END ARCHITECTURE

In this broad casting scenario which uses cloud computing, the client side architecture is referred to as front end architecture. The client comes into picture at the front end.

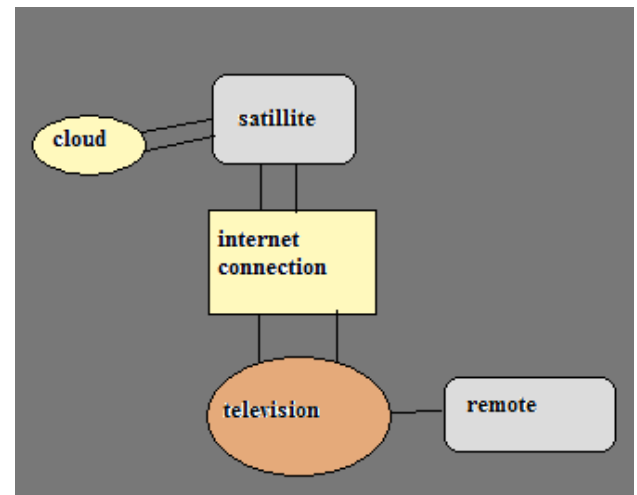


Figure 4. Client side architecture

The client side architecture is different from that of the conventional one, where the communication is one sided i.e. communication is only from provider to client. Here the communication will be two sided.

The major constraints at the user end will be a television, a high speed internet connection, set top box which can take the required input from user (like a TV remote). A request will be sent by a client through a TV which has internet connection to the cloud. This request will be processed by the application server this will search for the required information in the storage part. On the other hand database servers of different countries will be connected. This helps the user to access the data of any television channel located at any part of the globe.

This mode of broadcasting will not have the problem of only certain bandwidths made available in a particular country. Channels will not have to transmit separate frequencies instead a single band of frequency of the internet will be used.

VI. SERVICE PROVIDERS PERCEPTION

If the service providers switches from conventional broad casting to using cloud in broadcast then the initial installation charges may be high, but they can gain profits on long duration.

Here the paying mode can be made on number of hours and what channel is he watching and demand for that channel. The payment will be in the form of prepaid cards same as that of the cell phones that we are using in the present day. Charges will be deducted from the present balance depending on the usage.

At any single time a single client can access only one channel at any single time. So the rest database of other channels will be free which can be accessed by other clients. And data of each channel can be stored in a storage cloud which can be accessed by the clients afterwards.

The service providers can even attract the users by telecasting movies and songs. the client can be charged as per that.

A. *Advantages*

- The user can access any channel he wants and can pay for hours he has used. This is possible due to two way communication between the client and server. So the service provider will have the record of the channels the client accessed and accordingly he can be billed.
- The latest movies and songs can be viewed by the user without even going to the theaters. This will help to eradicate piracy as the user will can be charged as per the program he is watching.
- User can access any program which was telecasted previously. This is possible due to the complete database of the channels created in the cloud storage. So the client will be given a choice between which day programs he wants to watch.
- This is kind of broadcasting will be of great help for the small scale industries. In this system the industry need not have to own everything on its own. They can virtually use the hardware and pay relatively cheaper.

VII. CONCLUSION

With the present trends in the field of cloud computing this is a project of very high feasibility. But is an expensive project (although not, as proved by statistics). It is only a raw architecture and needs to be further clarified and will turn into a new model. As of now it cannot be compared with the existing systems in terms of economic feasibility. Although this is challenge in the present scenario if made as a change will yield good results.

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