

Cloud Based Television System using Virtual Machine



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Abstract: *Cloud computing is a technology where a large amount of data of any format can be stored. Existing cloud television systems uses the user's hardware such as graphics cards to render the videos. This makes the users with a low-grade graphics card difficult to render high quality videos which makes it difficult to watch videos of their required quality. The main aim in the paper is to use cloud computing in the field of television and to overcome the hardware usage of the user. This means that, without using the user's graphics card the user can view the video in the required quality. For this the required video is rendered by the admin using virtual machines created by the admin to stream the video in that virtual machine and then render that video to the user. This method makes sure that the users graphics card is not used and this method works when the user has a good display unit. Video of any quality can be played by the low-grade user, once when the virtual machine is created. Therefore, after the virtual machine is created this problem of not being able to play the video in the required quality will be resolved. An internet connection is required to stream the video by the user. Using internet connection, the user can access both the admin site and also the virtual machine provided by the admin. Now the video can be played without buffering, and also without popping an error claiming that the video is not compatible.*

Keywords: *Cloud computing, cloud television system, virtual machine, video rendering*

I. INTRODUCTION

In Cloud Computing people can generally store and retrieve the data from the computer. Cloud Computing is a metaphor of networks. It is transformative and the user can anytime access the cloud where the application delivery is done over the internet.

In Cloud Computing the user can store the data's and use at any time. The user can have any time access to the data and a shared resource pool is seen here. Cloud models are of three different types called as the infrastructure-as-a-service (IAAS), platform-as-a-service (PAAS) and software as a service (SAAS).

There are types of deployment model available are the public cloud, private cloud, hybrid cloud and community cloud. In public cloud the cloud services available to general public and private cloud is only available for exclusive single organisation hybrid cloud is a combination of multiple clouds.

A community cloud deployment model that allows and are used by organisation that have similar policies.

A community cloud is good for organisation where all the people can have access to the data but it will not be shared by large groups. A cloud can be built on virtual machine too.

A virtual machine acts the same as the computer hardware. Virtual machines provide a base for the physical part of the system. Virtualization refers to the division of work among the physical system. In Cloud Computing the work is divided

among several users using virtualization to virtual resources that run on top physical resources.

II. LITERATURE SURVEY

Cloud can be accessed from anywhere if there is an internet connection. A new technique called as virtualization has been introduced which means that, the user can create virtual machines depending upon the user's requests. Here the jobs are processed and executed randomly. There are jobs which will require more time to be executed and on the other side there are jobs which can be executed in shorter period of time. Therefore, the jobs which can be executed in less time has to wait for the jobs which are big. The virtual machine with some respective MIP may not be able to execute the jobs alone. So, it automatically creates another virtual machine in the same physical machine using the scheduling algorithm. The merit is that it can spare huge amount in cloud and its demerit is its complexity [1]. The data pipeline functions which include data processing are organized to transform the data which are very efficient [2]. The merit is the introduction of data analytics in cloud but at the same time it has demerit like it is expensive.

It leads to an understanding about how people can use cloud technology in television broadcasting. It is used to stream the tasks and also it is used as a thing where the admin can create the video which will have very high quality. The cost saving is 29 percent for the deployment of cloud which is inferred from an analysis. The merit is the content management and the demerits are the content compression [3]. It uses specific cases where the demands of the resources can be predicted.

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Therefore, an algorithm which responds to the predicted demands of the resource which has the virtual machine is shown. When a virtual machine is placed within a cloud with the anticipated environment, it can increase its efficiency while the user is using it. The change in the positioning of the virtual machine will increase the operation of the cloud system.

The merits of the virtual machine positioning in anticipated cloud computing is the load balancing approaches are available and its demerits are it has minimal customizable technique [4]. Cloud computing has both advantages as well as disadvantages when it comes to television and broadcasting industries. It also uses the virtualization technology where the virtual machines are created [5]. Its merits include reduced cost and demerit is the compression of data.

III. MODULE DESCRIPTION

The architecture diagram to display a video by rendering using a virtual machine is as follows,

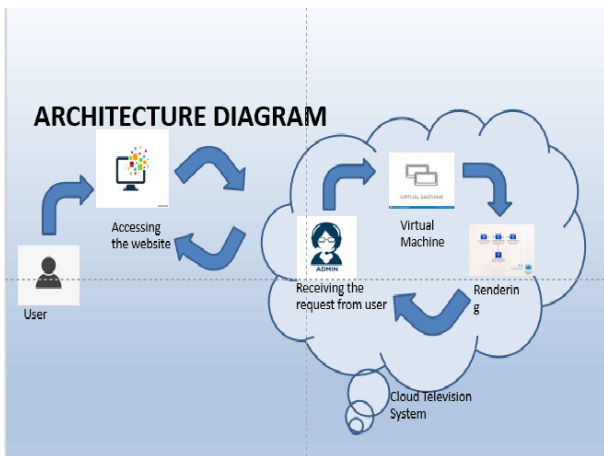


Fig. 1 Architecture diagram

A. User Accessing the website

The user opens the desired site and the site opens. This action requires a proper internet connection as the accessing of that site is not possible without a proper internet connection. A strong connection is required to access the videos. The pc can either be connected to a wireless internet connection or can be connected to a router if the pc is in a network.

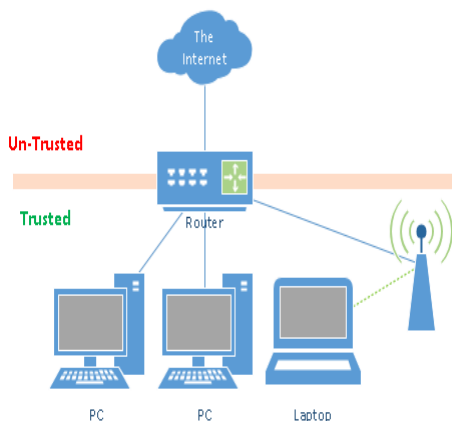


Fig. 2 Accessing website by the user

B. Receiving the request from the user

When the site opens, a list of videos will be displayed, the user can select the required video of his choice and can request the admin. If the computer has a graphics card inserted to it already, there will be no popping of errors claiming that the video is incompatible. In the other case if there is no graphics card attached to it, the video will not be played. We can overcome this by using a virtual machine.

C. Setting up the virtual machine

The primary open source cloud platform used here is azure by Microsoft. Microsoft azure is a set of cloud services provided by Microsoft corporations which helps the organisation to have a better cloud service. It provides a range of cloud services like compute analysis, storage and networking.



Fig. 3 Microsoft Azure logo

D. Creation of virtual machine in azure.

An Azure account is created as follows Creation of an azure account is important to create a virtual machine. Creation of an azure account can be done as follows

1. Select free account from the top left of the Azure homepage.
2. Click the button on the blue banner "Start for free".
3. Complete the form. Although this is a free trial account there is a need to enter the users credit/debit card details.
4. Enter email address, password associated with the account.



Fig.4 Login page

5. An email with a verification code will be received. Enter the code in the checkbox.

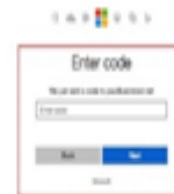


Fig.5 Register page

6. Enter the contact number to associate.
7. Complete the entries required. There is a process to enter the credit card or the debit card details.

The azure account is an open source and is free of cost, but this step is compulsory

8. Again a compulsory step of accepting to the terms and condition occurs. Agree and proceed to sign up.

To create a virtual machine the following steps are followed. Sign in to the Azure portal and then follow these steps

1. Click Create a resource in the upper left-hand corner of the Azure portal.

2. Select Compute, and then select Windows Server 2016 Datacentre.

3. Enter the information required. The user name and password entered here is used to sign in to the virtual machine. The password must be minimum of 12 characters and must meet the requirements. Click OK once this process is done.

4. Choose the maximum capacity of the virtual machine. Select a recommended size, or filter based on features. Finalise the size. Under Settings > High availability, select any one zones from the Availability zone dropdown, and click OK. click Create to start the virtual machine.

5. The virtual machine which is created will be pinned to the Azure portal. Once the work is completed, the VM summary opens.

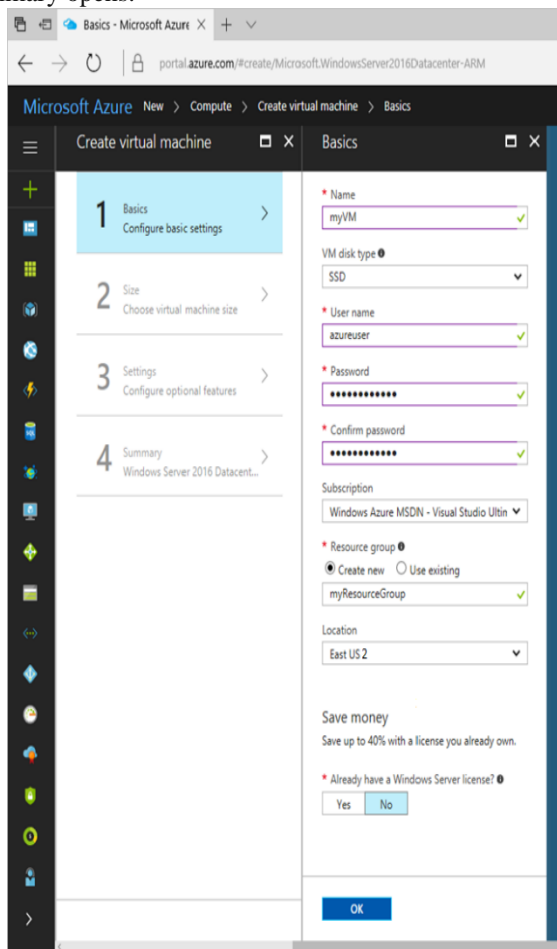


Fig.6 Description page

E. Processing of virtual machine

Two virtual machines are created. One virtual machine stores the link of the site which has videos in it. The other

virtual machine hosts the videos and plays the video in it after which the vm will render that video to the user. The user will not be aware if the fact that the site uses virtual machine to render the video. it is a hidden process which only show the result to the user and not the working of the virtual machine. The number of virtual machines used will also be hidden from the user. Only the cloud service provider who has the sites access will know the entire details of the virtual machines and its working.

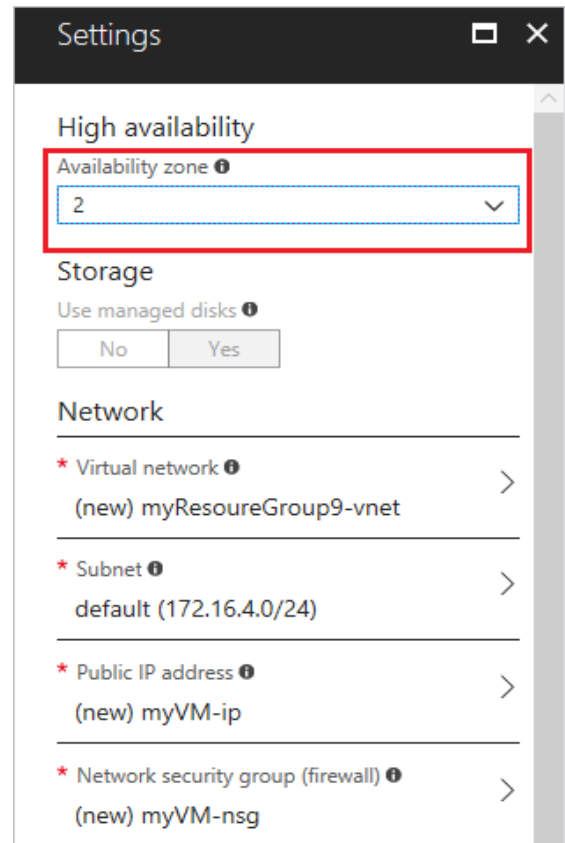


Fig 7. Creation of vm

IV. TECHNIQUES USED

A. Virtual machine

Virtual machine is created in a virtual environment. It acts the same as the normal hardware in a computer system. It has the same properties as that of the hardware but it is created by the user. The user creates the virtual machine by using few scheduling algorithms [1]. Two virtual machines are created here. It is a software computer which acts like a physical computer that can run an operating system. It is a software container that has the operating system and the applications inside it. It runs as a normal application within the os and works like a single system. The virtual machine is created when the requirement time is reached and it is destroyed when the final work of the virtual machine is deployed. It provides a platform independent environment where it uses the details of the operating system or the hardware and then the program can be executed in the same way in any other platform. These virtual machines are generally common with java language which can be done by the java virtual machine. The system can contain a group of clusters of machines connected together.



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Here the virtual machine will not consist of a single process but each physical machine in the cluster can have one process. Programmer will focus more on the algorithms than the communication mechanisms. Here when two virtual machines are created, we will be able to display the videos in the high quality which is required by us.

V. IMPLEMENTATION

Two virtual machines are created. One virtual machine stores the link of the site which has videos in it. The other virtual machine hosts the videos and plays the video in it after which the vm will render that video to the user. The user will not be aware if the fact that the site uses virtual machine to render the video. It is a hidden process which only show the result to the user and not the working of the virtual machine. The number of virtual machines used will also be hidden from the user. Only the cloud service provider who has the sites access will know the entire details of the virtual machines and its working.

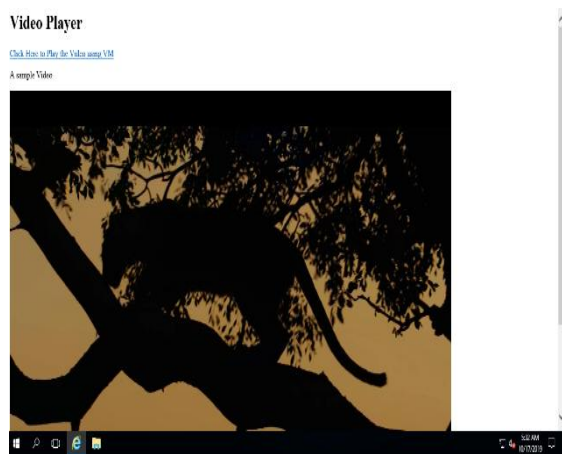


Fig 8. Video Playback

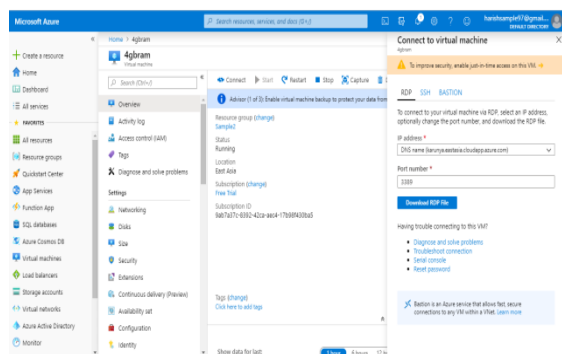


Fig 9. Microsoft Azure

VI. EXPERIMENTAL OUTPUT

When we open a page and click a particular video and if our computer is less capable of playing that video it will make use of the virtual machine and the virtual machine will render the video and then gives us the preferable output.

VII. FUTURE SCOPE

Cloud computing is still an improving field with many opportunities to do the research. More research is done to

manipulate the scheduling systems. More research is done to make new performance methods and then is analysed to check the performance of cloud applications. The main focus is to minimize the waiting time and the simulation toolkit is used to complete the task.

VIII. CONCLUSION

It is possible for a system now to play any type of videos that the user prefers to watch. The site need not require any expensive graphic cards inserted to it in order to play any videos. This can be implemented to any computer which can support internet connection in it.

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