IMPLEMENTATION OF VIRTUAL PRIVATE DRIVE USING CLOUD O. S.

Akanksha Bilse*

Pranita Mate*

Pravin Balbudhe*

Vikram Borkar*

ABSTRACT:

As an emerging technology and business paradigm cloud computing has taken commercial computing by storm cloud computing platform provides easy access to a company high performance computing and storage infrastructure through web services. This article gives a quick introduction to cloud storage in the form of virtual private drive in cloud o. s. in which you store your photos, docs, videos. and virtual drive with online music player ,video player and online PDF, doc viewer thus no need to download extra software and you will access your data from anywhere through your desktop ,mobile, laptops, tablets and servers or other computing resource with web browser.

Keywords - **cloud computing, cloud storage, cloud service ,Storage virtualization model, cloud storage architecture, cloud storage reference model**

* Department of Computer Technology, K.D.K.C.E, RTMNU, India.

I. INTRODUCTION:

Proposed system will be a free service that will let you bring all your photos, docs, and videos anywhere. This means that any file you save to your virtual drive will automatically save to all your computers, phones and even the virtual cloud website. Proposed system will also makes it super easy to share with others, whether you're a student or professional, parent . Even if you accidentally spill a latte on your laptop, have no fear! You can relax knowing that virtual drive always has been covered, and none of your stuff will ever be lost. Virtual device make sure that all your files are the same no matter where you're working from. This means that you can start working on a computer at school or the office, and finish from your home computer. Never email yourself a file again! We are planning to develop a application for your phone to simplify your life even more -- flip through all your photos or review that spreadsheet even while on the road. Virtual drive lets you work from any computer or phone with the confidence that you'll always have everything you need. From the perspective of data security, which has alwaysbeen an important aspect of quality of service, Cloud Computing inevitably poses new challenging security threats for number of reasons. Firstly, traditional cryptographic primitives for the purpose of data security protection can not be directly adopted due to the users' loss control of data under Cloud Computing. Therefore, verification of correct data storage in the cloud must be conducted without explicit knowledge of the whole data. Considering various kinds of data for each user stored in the cloud and the demand of long term continuous assurance of their data safety, the problem of verifying correctness of data storage in the cloud becomes even more challenging. Secondly, Cloud Computing is not just a third party data warehouse. The data stored in the cloud may be frequently updated by the users, including insertion, deletion, modification, appending, reordering, etc. To ensure storage correctness under dynamic data update is hence of paramount importance. However, this dynamic feature also makes traditional integrity insurance techniques futile and entails new solutions.

.

A. SHARE WHAT MATTERS MOST.

Virtual drive makes sharing so easy that you'll be amazed at the things you can do. Invite your friends, family and teammates to any folder in your virtual drive, and it'll be as if you saved that folder straight to their computers. You can send people links to specific files in your virtual drive too. This makes virtual drive perfect f sharing party photos with friends, or recording your band's new album or team projects,

B. WHAT IS CLOUD O.S.

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction

C. Overview

In the past, computing tasks such as word processing were not possible without the installation of application software on a user's computer. A user bought a license for each application from a software vendor and obtained the right to install the application on one computer system. With the development of local area networks (LAN) and more networking capabilities, the client-server model of computing was born, where server computers with enhanced capabilities and large storage devices could be used to host application services and data for a large workgroup. Typically, in client-server computing, a network-friendly client version of the application was required on client computers which utilized the client system's memory and CPU fo centrally on the data servers. Multiple user licenses of an application were purchased for use by many users on a network. Cloud computing differs from the classic client-server model by providing applications from a server that are executed and managed by a client's web browser, with no installed client version of an application required. A service provider may pool the processing power of multiple remote computers in a cloud to achieve routine tasks such as backing up of large amounts of data, word processing, or computationally intensive work. These tasks might normally be difficult, time consuming, or expensive for an individual user or a small company to accomplish, especially with limited computing resources and funds. With cloud computing, clients require only a simple computer, such as net-books, designed with cloud computing in mind, or even a Smartphone, with a connection to the Internet, or a company network, in order to make requests to and receive data from the cloud, hence the term "software as a service" (SaaS). Computation and storage is divided among the remote computers in order to handle large volumes of both, thus the client need not purchase expensive hardware or software to handle the task. The outcome of the processing task is returned to the client over the network, dependent on the speed of the Internet connection.

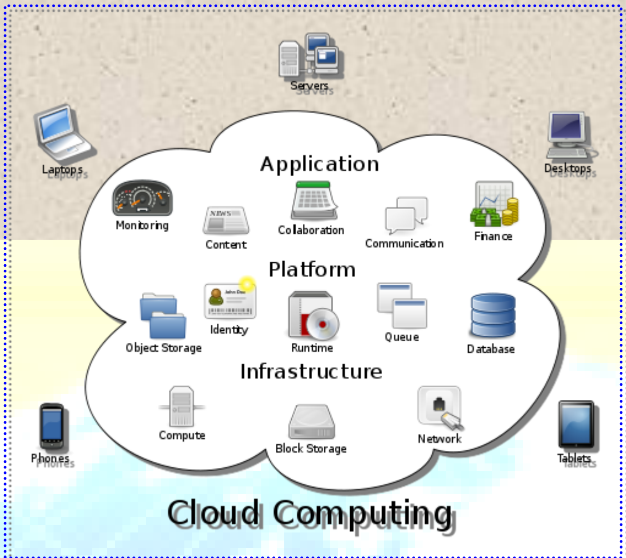

Figure1: cloud computing

D. Technical Description

Cloud computing provides computation, software, data access, and storage services that do not require end-user knowledge of the physical location and configuration of the system that delivers the services. Parallels to this concept can be drawn with the electricity grid, wherein end-users consume power without needing to understand the component devices or infrastructure required to provide the service Cloud computing describes a new supplement, consumption, and delivery model for IT services based on Internet protocols, and it typically involves provisioning of dynamically scalable and often virtualized resources It is a byproduct and consequence of the ease-of-access to remote computing sites provided by the Internet. This may take the form of web-based tools or applications that users can access and use through a web browser as if they were programs installed locally on their own computers

Cloud computing providers deliver applications via the internet, which are accessed from a Web browser, while the business software and data are stored on servers at a remote location. In some cases, legacy applications (line of business applications that until now have been prevalent in thin client Windows computing) are delivered via a screen-sharing technology such as Citrix Xen App, while the computing resources are consolidated at a r emote data center location; in some cases, legacy applications (line of business applications that until now have been prevalent in thin client Windows computing) are delivered via a screen-sharing technology such as Citrix Xen App, while the computing resources are consolidated at a remote data center location; in other cases, entire business applications have been coded using web-based technologies such as AJAX.

Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. The phrase "software as a service" (SaaS) is sometimes used to describe application programs offered through cloud computing. A common shorthand for a provided cloud computing service (or even an aggregation of all existing cloud services) “the cloud”.

Any computer or web-friendly device connected to the Internet may access the same pool of computing power, applications, and files in a cloud-computing environment. Users may remotely store and access personal files such as music, pictures, videos, and bookmarks; play games; or do word processing on a remote server. Data is centrally stored, so the user does not need to carry a storage medium such as a DVD or USB flash drive. Desktop applications that connect to internet-host email providers may be considered r processing, even though resultant application data files (such as word processing documents) were stored cloud applications, including web-based email services.

E. How It Work

A cloud user needs a client device such as a laptop or desktop computer, pad computer, smart phone, or other computing resource with a web browser (or other approved access route) to access a cloud system via the World Wide Web. Typically the user will log into the cloud at a service provider or private company, such as their employer. Cloud computing works on a client-server basis, using web browser protocols. The cloud provides server-based applications and all data services to the user, with output displayed on the client device. If the user wishes to create a document using a word processor, for example, the cloud provides a suitable application running on the server which displays work done by the user on the client web browser display. Memory allocated to the client system's web browser is used to make the application data appear on the client system display, but all computations and changes are recorded by the server, and final results including files created or altered are permanently stored on the cloud servers. Performance of the cloud application is dependent upon the network access, speed and reliability as well as the processing speed of the client device. Since cloud services are web-based, they work on multiple platforms, including Linux, Macintosh, and Windows computers. Smart phones, pads and tablet devices with Internet and World Wide Web access also provide cloud services t A service provider may pool the processing power of multiple remote computers in a cloud to achieve routine tasks such as backing up of large amounts of data, word processing, or computationally intensive work. These tasks might normally be difficult, time consuming, or expensive for an individual user or a small company to accomplish, especially with limited computing resources and funds. With cloud computing, clients require only a simple computer, such as net-books, designed with cloud computing in mind, or even a Smartphone, with a connection to the Internet, or a company network, in order to make requests to and receive data from the cloud, hence the term "software as a service" (SaaS). Computation and storage is divided among the remote computers in order to handle large volumes of both, thus the client need not purchase expensive hardware or software to handle the task. The outcome of the processing task is returned to the client over the network, dependent on the speed of the Internet connection.o telecommuting and mobile users.

II. CLOUD STORAGE:

Cloud storage is a model of networked online storage where data is stored on multiple virtual servers, generally hosted by third parties, rather than being hosted on dedicated servers. Hosting companies operate large data centers; and people who require their data to be hosted buy or lease storage capacity from them and use it for their storage needs. The data center operators, in the background, virtualized the resources according to the requirements of the customer and expose them as storage pools, which the customers can themselves use to store files or data objects. Physically, the resource may span across multiple servers. through based uses a Web- Cloud storage services may be accessed through a web service application programming interface(API), or interface The use of the term *cloud* in describing these new models arose from architecture drawings that typically used a cloud as the dominant networking icon. The cloud conceptually represented any to any connectivity in a network, but also an abstraction of concerns such the actual connectivity and the services running in the network that accomplish that connectivity with little manual intervention .This abstraction of complexity and promotion of simplicity is what primarily constitutes a cloud of resources, regardless of type. An important part of the cloud model in general is the concept of a pool of resources that is drawn from upon demand in small increments (smaller than what you would typically purchase by buying equipment). The recent innovation that has made this possible is virtualization. Thus cloud storage is simply the delivery of virtualized storage on demand. The formal term we propose for this is *Data Storage as a Service* (**DaaS**).

Cloud storage advantstages

Companies need only pay for the storage they actually use. Companies do not need to install physical storage devices in their own datacenter or offices, which reduces IT and hosting costs

III. STORAGE VIRTUALIZATION MODEL:

Storage Virtualization Model (SVM) is proposed firstly to introduce the abstract storage virtualization model. In this model, virtualization layers are the key point. After that, Virtual Storage Architecture (VSA) is proposed to introduce the specific virtual storage architecture. This architecture is based on SVM, and Virtual Storage Management Layer achieves this abstract modelFigure.2 shows the Storage Virtualization Model(SVM) .Firstly, Storage Virtualization (SV) screens the differences of physical storage devices, supplies uniform admininterface and user interface, distributes and maps physical devices. During storage access, SV will route logical address to physical address. All access operations will be completed in a transparent mode. As illustrated, SVM contains three virtualization layers: resource virtualization, logical space virtualization, storage network virtualization.

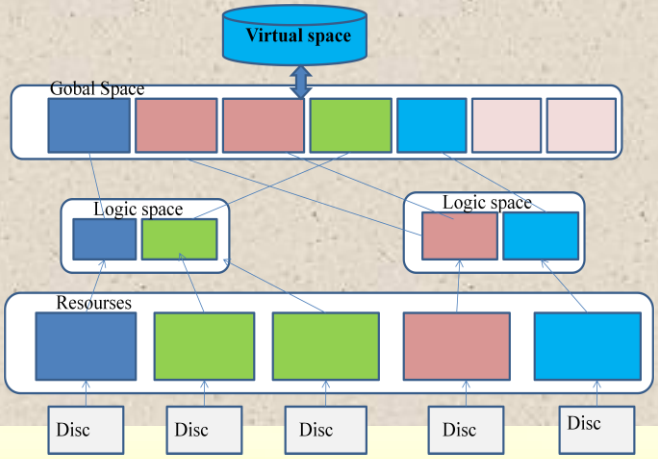

Figure 2 storage virtualization model

Resource virtualization maps physical devices to uniform marked virtual resource. Unified Resource Module (URM) is the core function module. It can map physical devices which have different physical properties, running supporters and operating systems to uniform basic resources. In this layer, physical devices can be low-cost, low performance personal computer (PC) or high performance storage server. They will be marked by their physical property, bandwidth and others astheir node properties. And other external parts can get them into a uniform mode.

Logical space virtualization maps unified resource to Logical space. Logical space contains the basic node named collection in SVM. All logical operations in LBVS are directed towards logical space. In this layer, collections are created by connecting and discovering the resources from Unified Resource Layer. Logical spaces are created in different user strategies. During constructive process, it unites resource property and other factors. Collection will be encapsulated to upper layer.

Storage network virtualization assembles collections in logical space into global space that can be logical addressed.

The global space that is made up of virtual storage pool can be managed by Virtual Storage Routing Table, Replica Routing Module and Writing Routing Module. These modules are located in virtual storage service server, and supply address mapping query service.

IV. VIRTUAL STORAGE ARCHITECTURE:

In this section, we introduce the Virtual Storage Architecture (VSA). The architecture is designed based on Storage Virtualization Model. As Figure3 shows, this architecture contains three Metadata Management Layer, Virtual Storage Management Layer. The three virtualization technology in SVM is used in Virtual Storage Management Layer. Rules and Micro Services that are composed by Rules control the flow of system on bottom layer

Interface Layer contains some interface modes for common users and administrators, including commands, Client, Web Browse and Sharing Folder

V. RULE AND METADETA MANAGEMENT:

We divide this layer into upper layer and under layer. In upper layer, we provide client and admin interface for two different interface with different rights. In this layer, we use Rule firstly. We abstract the minimum granular operations form storage processes Operating Transaction (OT). Rule is made up of these OTs.Rule Engine manages these Rules. Access and manage operations are defined as Rules in this system. When using Client interface, users' requests will be sent to Resource-based Service and Metadata-based Service in under layer by Rule invoking. When using Admin interface, administrators can manage Rule Engine, Resource Service and Metadata Service through Config Modifier Module, Rule Modifier Module, Service Manager and Metadata Modifier Module. In under layer, there are two function modules: Resource-based Service and Metadata-based Service. Resource-based Service controls resources scheduling based on Micro Service that is made up of Rules. Metadata-based Service manages metadata in this system

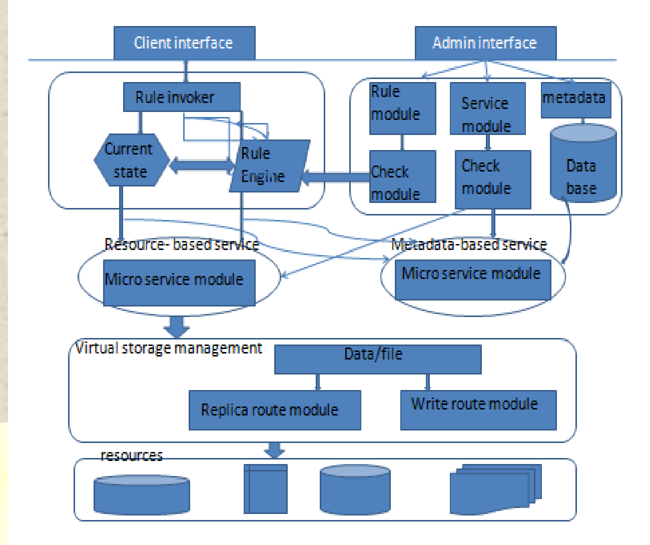

Figure 3:- Virtual storage architecture

VIRTUAL STORAGE MANAGEMENT LAYER is in charge of physical devices virtualization and data/file request load balancing scheduling. URM treats the virtualization of different physical devices in unified way. And URM maintains the parameters of physical device, including rotating speed of disk , bandwidth, volume, etc. System maintains a table holding these parameters. After analyzing

resource nodes, system will assemble the collections in logic space and structure a global space at last. System maintains a routing table from top to bottom. When having data/file writing request, system invokes Writing Routing Module to route write operation firstly. When having data/file access request, system invokes Replica Routing Module to control data/file replica to balance load.

VI. CLOUD STORAGE REFERENCE MODEL :

The appeal of cloud storage is due to some of the same attributes that define other cloud services: pay as you go the illusion of infinite capacity (elasticity), and the simplicity of use/management. It is therefore important that any interface for cloud storage support these attributes, while allowing for a multitude of business cases and offerings, long into the future The model created and published by the Storage Networking Industry Association™ ,shows multiple types of cloud data storage interfaces able to support both legacy and new applications. All of the interfaces allow storage to be provided on demand, drawn from a pool of resources. The capacity is drawn from a pool of storage capacity provided by storage services. The data services are applied to individual data elements as determined by the data system metadata. Metadata specifies the data requirements on the basis of individual data elements or on groups of data elements (containers). As shown in Fig 4, the SNIA Cloud Data Management Interface (CDMI) is the functional interface that applications will use to create, retrieve, update and delete data elements from the cloud. As part of this interface the client will be able to discover the capabilities of the cloud storage offering and use this interface to manage containers and the data that is placed in them. In addition, metadata can be set on containers and their contained data elements through this interface.

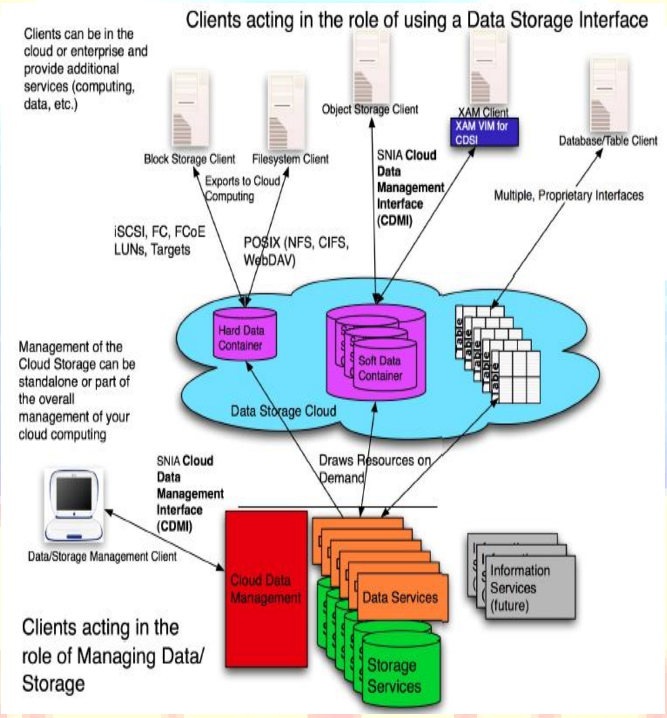

Figure4: cloud storage reference mode

It is expected that the interface will be able to be implemented by the majority of existing cloud storage offerings today. This can be done with an adapter to their existing proprietary interface, or by implementing the interface directly. In addition, existing client libraries such as XAM can be adapted to this interface as show in Figure4This interface is also used by administrative and management applications to manage containers, accounts, security access and monitoring/billing information, even for storage that is accessible by other protocols. The capabilities of the underlying storage and data services are exposed so that clients can understand the offering. Conformant cloud offerings may offer a subset of either interface as long as they expose the limitations in the capabilities part of the interface.

VII. ARCHITECTURE OF CLOUD DATA STORAGE:

A representative network architecture for cloud data storage is illustrated in Figure 5. Three different network entities canbe identified as follows:

User: users, who have data to be stored in the cloud and rely on the cloud for data computation, consist of both individual consumers and organizations.

Cloud Service Provider (CSP): a CSP, who has significant resources and expertise in building and managing distributed cloud storage servers, owns and operates live Cloud Computing systems.

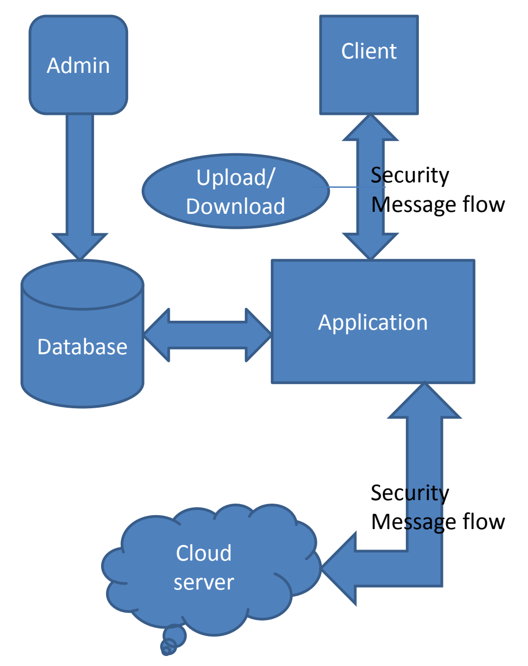

Figure5. architecture of cloud data storage.

Third Party Auditor (TPA): an optional TPA, who has expertise and capabilities that users may not have, is trusted to assess and expose risk of cloud storage services on behalf of the users upon request.

In cloud data storage, a user stores his data through a CSP into a set of cloud servers, which are running in a simultaneous, cooperated and distributed manner. Data redundancy can be employed with technique of erasure-correcting code to further tolerate faults or server crash as user's data grows in size and importance. Thereafter, for application purposes, the user interacts with the cloud servers via CSP to access or retrieve his data. In some cases, the user may need to perform block level operations on his data. The most general forms of these operations we are considering are block update, delete, insert and append. As users nolonger possess their data locally, it is of critical importance to assure users that their data are being correctly stored and maintained. That is, users should be equipped with security means so that they can make continuous correctness assurance of their stored data even without the existence of local copies. In case that users do not necessarily have the time, feasibility or resources to monitor their data, they can delegate the tasks to an optional trusted TPA of their respective choices. In our model, we assume that the point-to-point communication channels between each cloud server and the user is authenticated and reliable, which can be achieved in practice with little overhead. Note that we don't address the issue of data privacy in this paper, as in Cloud Computing, data privacy is orthogonal to the problem we study here.

VIII. CONCLUSION AND FUTURE WORK:

The paper proposes the architecture of the cloud storage, and discusses the related key technologies. Cloud storage is a new concept, its related products and research is still in the initial state. With the rapid increase of data storage in network , the cloud will become increasingly important , market demand will be more strong . Future research in the general cloud storage hardware environment is to achieve the key software technology. Emphasis should be concerned about the performance, reliability, fault tolerance, ease of use, scalability and self-management capabilities, as well as cloud storage and cloud computing for the next generation of operating system development

ACKNOWLEDGMENT:

The authors would like to thank Prof. Sumit Vinchulkar without whose valuable advice and suggestion at every stage of our dissertation would not have been feasible.

REFERENCES:

- Deng, Jiabin; Hu, JuanLi; Liu, Anthony Chak Ming; Wu, Jueb "Research and Application of cloud Storage," Intelligent Systems and Applications (ISA), 2010 2nd International Workshop on Digital Object Identifier. 2008 , Page(s): 344 – 344.
- Gabriel Antoniu,Autonomic, "Cloud Storage: Challenges at Stake,2010 International Conference on Complex, Intelligent and Software Intensive Systems.
- Kevin D.Bowers,Ari Juels, and Alina Oprea. HAIL: A High-Availability and Integrity Layer for Cloud Storage. Cryptology ePrint Archive, Report 2008/489, Retrieved from
- Yunhong Gu and Robert L.Grossman. Sector and Sphere:the design And implementation of a high-performance data cloud. Philosophical Transactions of the Royal Society. A(2009)367: 2429-2445.
- Likun Liu, Yongwei Wu, Guangwen Yang, and Weinun Zheng. Zettads: A light-weight distributed storage system for cluster. In: Proc. Of the third ChinaGrid Annual Conference, 2008,158-164.
- Y. Simmhan, M. Giakkoupis, B. Cao, and V. K. Prasanna "On Using Cloud Platforms in a Software Architecture for smart Energy grid," in IEEE international conference on cloud computing (cloudcom),2009
- Sun Microsystems, Inc. 2009. Introduction to Cloud Computing architecture. Computing. pdf, White Paper, I st Edition, June 2009: 1-32.
- Jiyi WU1,2, Lingdi PING1, Xiaoping GE3,Ya Wang4, Jianqing FU1 "Cloud Storage as the Infrastructure of Cloud Computing"2010 International Conference on Intelligent Computing and Cognitive informatics pp 380-383 ,2010 IEEE DOI 10.1109/ICICCI.2010.119