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VIRTUAL MACHINEHAND-IN-HAND AND RELOCATION FOR INFRASTRUCTURE AS A SERVICE IN CLOUD STORAGE

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***Abstract*—** Cloud computing is capable of handling a huge amount of growing work in a predestined manner for the usage of the business customers. The main enabling technology for cloud computing is virtualization which generalize the physical infrastructure and makes it easy to use and manage. In this project virtualization is used to allocate resources based on their needs and also supports green computing concept. "Skewness" concept is introduced here in which the same is minimized to combine various workloads to improve the utilization of the server. Managing the customer demand creates the challenges of on demand resource allocation. So can implement Virtual Machine (VM) technology has been employed for resource provisioning. It is expected that using virtualized environment will reduce the average job response time as well as executes the task according to the availability of resources. Hence VMs are allocated to the user based on characteristics of the job. The VM live migration technology makes the VM and PM (Physical machine) mapping possible when the execution is running. Effective and dynamic utilization of the resources in cloud can help to balance the load and avoid situations like slow run of systems. This implementation can be use local negotiation based VM consolidation mechanism to predict each job request and reduce overloads to create virtual space at the time of multiple requests. The proposed system implement co-location approach to combine unused small spaces to create new virtual space for improves the performance of server. And also using self-destruction approach to eliminate the invalid data based on time to live property. The proposed system is implemented in real time with efficient resource allocation. In this framework first develop an online prediction model which can estimate the partition sizes of reduce tasks at runtime.

I. INTRODUCTION

Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. It is a practical approach to experience direct cost benefits and it has the potential to transform a data center from a capital-intensive set up to a variable priced environment. The idea of cloud computing is based on a very fundamental principles of reusability of IT capabilities. The difference that cloud computing brings compared to traditional concepts of "grid computing, distributed computing, utility computing, or autonomic computing is to broaden horizons across organizational boundaries. Forrester defines cloud computing as A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end customer applications and billed by consumption. It is a technology that uses the internet and central remote servers to maintain data and applications and allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth. Cloud computing examples are Yahoo email, Gmail, or Hotmail.

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1) Architecture:

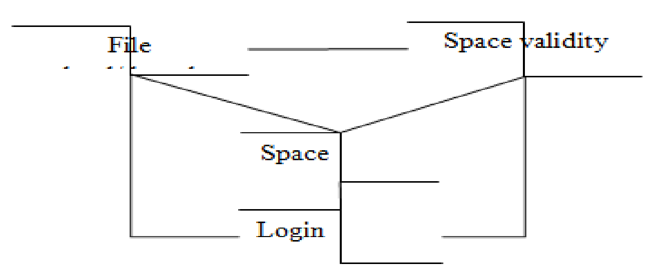

Figure 1 Architecture of Cloud Computing

2) Cloud Provider

A person, organization, or entity responsible for making a service available to interested parties. A Cloud Provider acquires and manages the computing infrastructure required for providing the services, runs the cloud software that provides the services, and makes arrangement to deliver the cloud services to the Cloud Consumers through network access .

3)Cloud Consumer

A person or organization that maintains a business relationship with, and uses service from, Cloud Providers. A cloud consumer browses the service catalog from a cloud provider, requests the appropriate service, sets up service contracts with the cloud provider, and uses the service. The cloud consumer may be billed for the service provisioned, and needs to arrange payments accordingly.

What is not covered here is the **end user** that consumes the possibly enriched service offered by the Cloud Consumer. In SaaS, the Cloud Consumer is often identical with the end user. However, in business environments this is not always the case. Using the example of GMail, only the paying entity is the Cloud Customer (e.g. IT department) whiles many other employees may use the mailing service as end users.

4) Cloud Auditor

A party that can conduct independent assessment of cloud services, information system operations, performance and security of the cloud implementation. A cloud auditor is a party that can perform an independent examination of cloud service controls with the intent to express an opinion thereon. Audits are performed to verify conformance to standards through review of objective evidence. A cloud auditor can evaluate the services provided by a cloud provider in terms of security controls, privacy impact, performance, etc.

5) Cloud Broker

As cloud computing evolves, the integration of cloud services can be too complex for cloud consumers to manage. A cloud consumer may request cloud services from a cloud broker, instead of contacting a cloud provider directly. Hence the broker is an entity that manages the use, performance and delivery of cloud services, and negotiates relationships between Cloud Providers and Cloud Consumers. Brokers provide three different types of services to the Cloud Consumer.

6) Mediating Broker

A cloud broker enhances a given service by improving some specific capability and providing value-added services to cloud consumers. The improvement can be managing access to cloud services, identity management, performance reporting, enhanced security, etc.

7) Aggregating Broker

A cloud broker combines and integrates multiple services into one or more new services. The broker provides data integration and ensures the secure data movement between the cloud consumer and multiple cloud providers.

8) Arbitraging Broker

Service arbitrage is similar to service aggregation except that the services being aggregated are not fixed. Service arbitrage means a broker has the flexibility to choose services from multiple agencies. The cloud broker, for example, can use a credit-scoring service to measure and select an agency with the best score.

9) SERVICE MODELS OF CLOUD

Cloud Providers offer services that can be grouped into three categories in figure 1.2.

SAAS	SOFTWARE	SALESFORCE.COM, NETSUITE, OFFICE COMMUNICATION
PAAS	PLATFORM	WINDOWS AZURE PLATFORM, GOOGLE APP ENGINE
IAAS	INFRASTRUCTURE	RACK SPACE, GIGA SPACE, GOGRID, AMAZON WEB SERVICE

Figure 2 Types of cloud services

- Software as a Service (SaaS)
- Platform as a Service (Paas)
- Infrastructure as a Service (Iaas)

A. Software as a Service

In this model, a complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud & multiple end users are serviced. On the customer's side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted & maintained. Today SaaS is offered by companies such as Google, Salesforce, Microsoft, Zoho, etc.

B. Platform as a Service

Here, a layer of software or development environment is encapsulated & offered as a service, upon which other higher levels of service can be built. The customer has the freedom to build his own applications, which run on the providers infrastructure. To meet manageability and scalability requirements of the applications, PaaS providers offer a predefined combination of OS and application servers, such as LAMP platform (Linux, Apache, MySql and PHP), restricted J2EE, Ruby etc. Google‟s App Engine, Force.com, etc are some of the popular PaaS examples.

C. Infrastructure as a Service

IaaS provides basic storage and computing capabilities as standardized services over the network. Servers, storage systems, networking equipment, data centre space etc. are pooled and made available to handle workloads. The customer would typically deploy his own software on the infrastructure. Some common examples are Amazon, GoGrid, 3 Tera, etc.

10) DEPLOYMENT MODELS OF CLOUD

Enterprises can choose to deploy applications on Public, Private or Hybrid clouds. Cloud Integrators can play a vital part in determining the right cloud path for each organization.

A. Public Cloud

Public clouds are owned and operated by third parties; they deliver superior economies of scale to customers, as the infrastructure costs are spread among a mix of users, giving each individual client an attractive low-cost, "Pay-as-you-go" model. All customers share the same infrastructure pool with limited configuration, security protections, and availability variances. These are managed and supported by the cloud provider. One of the advantages of a Public cloud is that they may be larger than an enterprises cloud, thus providing the ability to scale seamlessly, on demand.

B. Private Cloud

Private clouds are built exclusively for a single enterprise. They aim to address concerns on data security and offer greater control, which is typically lacking in a public cloud. There are two variations to a private cloud

- On-premise Private Cloud
- Externally hosted
- Private Cloud

C. On-premise Private Cloud

On-premise private clouds, also known as internal clouds are hosted within one's own data center. This model provides a more standardized process and protection, but is limited in aspects of size and scalability. IT departments would also need to incur the capital and operational costs for the physical resources. This is best suited for applications which require complete control and configurability of the infrastructure and security.

D. Externally hosted Private Cloud

This type of private cloud is hosted externally with a cloud provider, where the provider facilitates an exclusive cloud environment with full guarantee of privacy. This is best suited for enterprises that don't prefer a public cloud due to sharing of physical resources.

E. Hybrid Cloud

Hybrid Clouds combine both public and private cloud models. With a Hybrid Cloud, service providers can utilize 3rd party Cloud Providers in a full or partial manner thus increasing the flexibility of computing. The Hybrid cloud environment is capable of providing on-demand, externally provisioned scale.

The ability to augment a private cloud with the resources of a public cloud can be used to manage any unexpected surges in workload

11) CLOUD COMPUTING BENEFITS

Enterprises would need to align their applications, so as to exploit the architecture models that Cloud Computing offers. Some of the typical benefits are listed below

- Reduced Cost
- Increased Storage
- Flexibility

A. Reduced Cost

There are a number of reasons to attribute Cloud technology with lower costs. The billing model is pay as per usage the infrastructure is not purchased thus lowering maintenance. Initial expense and recurring expenses are much lower than traditional computing.

B. Increased Storage

With the massive Infrastructure that is offered by Cloud providers today, storage and maintenance of large volumes of data is a reality. Sudden workload spikes are also managed effectively and efficiently, since the cloud can scale dynamically.

C. Flexibility

This is an extremely important characteristic. With enterprises having to adapt, even more rapidly, to changing business conditions, speed to deliver is critical. Cloud computing stresses on getting applications to market very quickly, by using the most appropriate building blocks necessary for deployment.

12) CLOUD COMPUTING CHALLENGES

Despite its growing influence, concerns regarding cloud computing still remain. In our opinion, the benefits outweigh the drawbacks and the model is worth exploring. Some common challenges are:

1) Data Protection
2) Data Recovery and Availability
3) Management Capabilities

A. Data Protection

Data Security is a crucial element that warrants scrutiny. Enterprises are reluctant to buy an assurance of business data security from vendors. They fear losing data to competition and the data confidentiality of consumers. In many instances, the actual storage location is not disclosed, adding onto the security concerns of enterprises. In the existing models, firewalls across data centers (owned by enterprises) protect this sensitive information. In the cloud model, Service providers are responsible for maintaining data security and enterprises would have to rely on them.

B. Data Recovery and Availability

All business applications have Service level agreements that are stringently followed. Operational teams play a key role in management of service level agreements and runtime governance of applications. In production environments, operational teams support

- Appropriate clustering and Fail over
- Data Replication
- System monitoring (Transactions monitoring, logs monitoring and others)
- Maintenance (Runtime Governance)

If, any of the above mentioned services is under-served by a cloud provider, the damage and impact could be severe.

C. Management Capabilities

Despite there being multiple cloud providers, the management of platform and infrastructure is still in its infancy. Features like Auto-scaling for example, is a crucial requirement for many enterprises. There is huge potential to improve on the scalability and load balancing features provided today.

D. Regulatory and Compliance Restrictions

In some of the European countries, Government regulations do not allow customer's personal information and other sensitive information to be physically located outside the state or country. In order to meet such requirements, cloud providers need to setup a data center or a storage site exclusively within the country to comply with regulations. Having such an infrastructure may not always be feasible and is a big challenge for cloud providers. With cloud computing, the action moves to the interface that is, to the interface between service suppliers and multiple groups of service consumers. Cloud services will demand expertise in distributed services, procurement, risk assessment and service negotiation areas that many enterprises are only modestly equipped to handle.

13) CLOUD SCHEDULING

Cloud Scheduler is a fully managed enterprise-grade cron job scheduler. It allows you to schedule virtually any job, including batch, big data jobs, cloud infrastructure operations, and more. You can automate everything, including retries in case of failure to reduce manual toil and intervention. Cloud Scheduler even acts as a single pane of glass, allowing you to manage all your automation tasks from one place. Cloud Computing is an emerging technique. Recently it is found that researchers are interested in using cloud for performing scientific applications and even the big organizations are on the verse of switching over to hybrid cloud. Many complex applications require parallel processing to execute the jobs effectively. Due to the communication and synchronization among parallel processes there is a decrease in utilization of CPU resources. It is necessary for a data center to achieve the utilization of nodes while maintaining the level of responsiveness of parallel jobs. The cloud computing is attracting an increased number of applications to run in the remote data centers. Many complex applications require parallel processing capabilities.

II. LITERATURE SURVEY

1) TITLE: HOTSNAP: A HOT DISTRIBUTED SNAPSHOT SYSTEM FOR VIRTUAL MACHINE CLUSTER AUTHOR: CUI, LEI

With the increasing prevalence of cloud computing and IaaS paradigm, more and more distributed applications and systems are migrating to and running on virtualization platform. In virtualized environments, distributed applications are encapsulated into virtual machines, which are connected into virtual machine cluster (VMC) and coordinated to complete the heavy tasks. The management of virtual machine cluster (VMC) is challenging owing to the reliability requirements, such as non-stop service, failure tolerance, etc. Distributed snapshot of VMC is one promising approach to support system reliability, it allows the system administrators of data centers to recover the system from failure, and resume the execution from a intermediate state rather than the initial state. However, due to the heavyweight nature of virtual machine (VM) technology, applications running in the VMC suffer from long downtime and performance degradation during snapshot. Besides, the discrepancy of snapshot completion times among VMs brings the TCP backoff problem, resulting in network interruption between two communicating VMs. This paper proposes HotSnap, a VMC snapshot approach designed to enable taking hot distributed snapshot with milliseconds system downtime and TCP backoff duration. At the core of HotSnap is transient snapshot that saves the minimum instantaneous state in a short time, and full snapshot which saves the entire VM state during normal operation. We then design the snapshot protocol to coordinate the individual VM snapshots into the global consistent state of VMC. We have implemented HotSnap on QEMU/KVM, and conduct several experiments to show the effectiveness and efficiency. Compared to the live migration based distributed snapshot technique which brings seconds of system downtime and network interruption, HotSnap only incurs tens of milliseconds.

Advantage

- Enables taking hot snapshot of virtual machine

Disadvantage

- Cannot implement environments in real time

*2)*TITLE: VMAR: OPTIMIZING I/O PERFORMANCE AND RESOURCE UTILIZATION IN THE CLOUDAUTHOR: SHEN, ZHIMING

The economies of scale of cloud computing, which differentiates it from transitional IT services comes from the capability to elastically multiplex different workloads on a shared pool of physical computing resources. This elasticity is driven by the standardization of workloads into moveable and shareable components. To date, virtual machine images are the de facto form of standard templates for cloud workloads. Typically, a cloud environment provides a set of "golden master" images containing the operating system and popular middleware and application software components.A key enabler for standardized cloud services is the encapsulation of software and data into VM images. With the rapid evolution of the cloud ecosystem, the number of VM images is growing at high speed. These images, each containing gigabytes or tens of gigabytes of data, create heavy disk and network I/O workloads in cloud data centers. Because these images contain identical or similar OS, middleware, and applications, there are plenty of data blocks with duplicate content among the VM images. However, current deduplication techniques cannot efficiently capitalize on this content similarity due to their warm-up delay, resource overhead and algorithmic complexity. We propose an instant, non-intrusive, and lightweight I/O optimization layer tailored for the cloud: Virtual Machine I/O Access Redirection (VMAR). VMAR generates a block translation map at VM image creation / capture time, and uses it to redirect accesses for identical blocks to the same filesystem address before they reach the OS. This greatly enhances the cache hit ratio of VM I/O requests and leads to up to 55% performance gains in instantiating VM operating systems (48% on average), and up to 45% gain in loading application stacks (38% on average). It also reduces the I/O resource consumption by as much as 70%.

Advantage

- Bringing their image data to the memory page cache

Disadvantage

- Does not rely on any specific CPU/memory

3)TITLE: AUTOMATIC MEMORY CONTROL OF MULTIPLE VIRTUAL MACHINES ON A CONSOLIDATED SERVER AUTHOR: ZHANG, WEI-ZHE

Virtualization has resurged as a result of cloud computing. More and more applications are deployed into virtual machines (VMs) to multiplex a physical server. Although the resources of these VMs (such as CPU and memory) are isolated through virtual machine monitor (VMM) subsystems, automatic control systems can reallocate the limited resources of the consolidated server dynamically, which can reduce the running time of applications and maximize resource utilization. In this study, we devise a lightweight framework based on the Xen balloon driver to control memory in the consolidation of multiple VMs. Our system is implemented in user space that does not interfere with VMM operation. For this framework, we propose a global-scheduling algorithm that runs on Domain0. This algorithm solves linear equations to obtain the global solution and adapts to sufficient and insufficient states using dynamic baselines. Real-world benchmarks are adopted as workloads in our experiments, and 10 VMs are utilized. In this study, we devise a system for automatic memory control based on the balloon driver in Xen VMs. Researchers can download our toolkit, which is under a GNU GPL v3 license, for free. Our system aims to optimize the running times of applications in consolidated environments by overbooking and/or balancing the memory pages of Xen VMs. Unlike traditional methods, such as MEB, our system is lightweight and can be completely integrated into user space without interfering with VMM operation. We also design a global-scheduling algorithm based on the dynamic baseline to determine the optimal allocation of memory globally.

Advantage

- Scalable and suitable for various applications

Disadvantage

- Lower memory problems can be occurred

4)TITLE: LOW-COST DATA DEDUPLICATION FOR VIRTUAL MACHINE BACKUP IN CLOUD STORAGEAUTHOR: WEI ZHANG

Periodic archiving of virtual machine (VM) snapshots is important for long-term data retention and fault recovery. For example, daily backup of VM images is conducted automatically at Alibaba which provides the largest public cloud service in China. The cost of frequent backup of VM snapshots is high because of the huge storage demand. This issue has been addressed by storage data deduplication that identifies redundant content duplicates among snapshots. One architectural approach is to attach a separate backup system with deduplication support to the cloud cluster, and every machine periodically transfers snapshots to the attached backup system. Such a dedicated backup configuration can be expensive, considering that significant networking and computing resource is required to transfer raw data and conduct signature comparison. This paper seeks for a low-cost architecture option and considers that a backup service uses the existing cloud computing resource. Performing deduplication adds significant memory cost for comparison of content fingerprints. Since each physical machine in a cluster hosts many VMs, memory contention happens frequently. Cloud providers often wish that the backup service only consumes small or modest resources with a minimal impact to the existing cloud services. Another challenge is that deletion of old snapshots compete for computing resource as well, because data dependence created by duplicate relationship among snapshots adds processing complexity. Among the three factors - time, cost and deduplication efficiency, one of them has to be compromised for the other two. For instance, if we were building a deduplication system that has a high rate of duplication detection and has a very fast response time, it would need a lot of memory to hold fingerprint index and cache. This leads to a compromise on cost. Our objective is to lower the cost incurred while sustaining the highest de-duplication ratio and a sufficient throughput in dealing with a large number of VM images.

Advantage

- Low-cost multi-stage parallel reduplication solution

Disadvantage

- Difficult to analyze production workloads

III. SYSTEM DESIGN

1) EXISTING SYSTEM

Cloud computing refers to applications and services offered over the Internet. These services are offered from data centers all over the world, which collectively are referred to as the cloud. Cloud computing is a movement away from applications needing to be installed on an individual's computer towards the applications being hosted online. Cloud resources are usually not only shared by multiple users but as well as dynamically re-allocated as per demand. This can work for allocating resources to users in different time zones. Resource scheduling and allocation is very critical issue in cloud computing. Any computation is carried out when there is sufficient or proportionate resources available. Services are provided to the customers or end users with the proper analysis of resources. Cloud computing plays a vital role is a model for enabling ubiquitous network access to a shared pool of configurable computing resources. Any cloud provides services mainly three ways software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS). Infrastructure as a service in cloud grabs much attention in Cloud computing. To utilize resources more efficiently an optimized scheduling algorithm is used to address cloud scheduling problems. By deploying virtual machines in appropriate locations to improve the speed of locating best allocation method which intern permit maximum utilization of resources available.

2) Auction based Models

Continuous Double Auction (CDA) has been investigated for resource allocation for grid computing. CDA is considered as one of the most famous auction mechanisms and it is applied in electronic stock market. Bids by participants can be submitted anytime when auction is going on. They argue that as compared to non-market based mechanism, market based approach performs better for task utilization and resource allocation process. But the main drawback of this scheme is that it does not consider resource allocation for multiple items, only single item or resource allocation process has been considered. This approach was used for local grid environment for allocating CPU time. Another resource allocation technique for market based environment in grid is combinatorial double auction was proposed which brought revenue maximization and economy efficiency. This proposed method had

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the advantage of monetary based approach and flexibility.

3.1.1 Disadvantages

- Workloads are not handled properly.
- Loads are queued in storage system so provide low progress rate.
- Overhead occurred at the time of repartitioning the data.
- Imbalance in work load tasks.

3) PROPOSED SYSTEM

This project implements the framework named as VM consolidation mechanism for dynamic resource allocation. VM consolidation mechanism has become a popular model for large scale data processing in recent years. However, existing schedulers still suffer from an issue known as partitioning skew, where the output of map tasks is unevenly distributed among various systems. In this project, present VM consolidation mechanism which is a framework that provides run-time partitioning skew mitigation. Unlike previous approaches that try to balance the workload of reducers by repartitioning the intermediate data assigned to each reduce task, in VM consolidation mechanism we cope with partitioning skew by adjusting task run-time resource allocation. We show that our approach allows VM consolidation mechanism to eliminate the overhead of data repartitioning. There are two main challenges that need to be addressed in VM consolidation mechanism. First, to identify partition skew, it is necessary to develop a run-time forecasting algorithm that predicts the partition size of each reducer. Second, in order to determine the right container size for each reduce task, it is necessary to develop a task performance model that correlates task running time with resource allocation.

The repartitioning mechanism used based on a partitioning plan, and as result, it requires progressive sampling to be executed each time before the job starts. In our case, since we do not need to modify the implementation of partitioning, our partition size prediction can be done entirely online. Thus, we found our current prediction scheme is simple yet sufficient to produce high quality prediction results. We can implement Co-Located VM at the time resource available. We can combine unused small number of virtual machine space to create new virtual space to users and also self-destruction approach to flush the data in cloud provider using time to live property. In Cloud Storage we store personal data which contain details that are occupied more space after validity. Self-destruction system mainly aims delete the user valuable data based on time live property. All the information and their copies become destructed .In this project, we present a system that meets through integration of active storage techniques.

4) Advantages

- Balanced load predicted approach
- Overcome the degradation of server performance
- Efficient load balancing at the time of overflow the jobs.

IV. SYSTEM DESIGN

1) SYSTEM ARCHITECTURE

Software architecture involves the high level structure of software system abstraction, by using decomposition and composition, with architectural style and quality attributes. A software architecture design must conform to the major functionality and performance requirements of the system, as well as satisfy the non-functional requirements such as reliability, scalability, portability, and availability. Software architecture must describe its group of components, their connections, interactions among them and deployment configuration of all components.

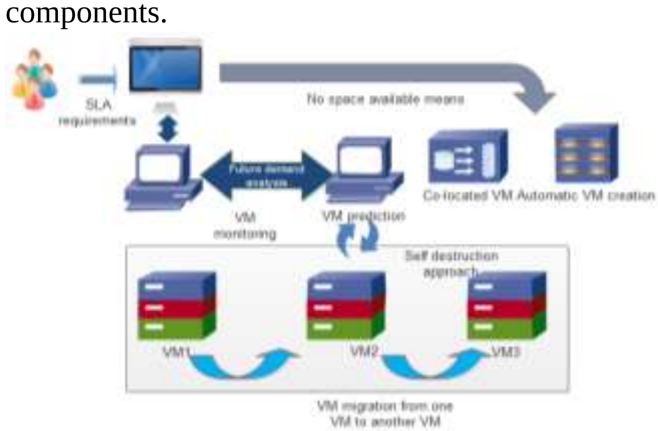

Figure 3 : System Architecture

2) DATA FLOW DIAGRAM

A Data Flow Diagram is a graphical representation of the “flow” of data through an information system modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system which can later be elaborated. DFDs can also use for the visualization of data processing.

LEVEL 0

The Level 0 DFD shows how the system is divided into 'sub-systems' (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the system as a whole. It also identifies internal data stores that must be present in order for the system to do its job, and shows the flow of data between the various parts of the system.

LEVEL-1

The next stage is to create the Level 1 Data Flow Diagram. This highlights the main functions carried out by the system. As a rule, to describe the system was using between two and seven functions - two being a simple system and seven being a complicated system. This enables us to keep the model manageable on screen or paper.

LEVEL-2

A Data Flow Diagram (DFD) tracks processes and their data paths within the business or system boundary under investigation. A DFD defines each domain boundary and illustrates the logical movement and transformation of data within the defined boundary. The diagram shows 'what' input data enters the domain, 'what' logical processes the domain applies to that data, and 'what' output data leaves the domain. Essentially, a DFD is a tool for process modeling and one of the oldest.

V. SYSTEM IMPLEMENTATION

A. MODULES

1. Cloud resource framework
2. SLA prediction
3. VM monitoring
4. Co-located VM approach
5. Self-destruction

1) CLOUD RESOURCE FRAMEWORK

Cloud computing emerges as a new computing paradigm which aims to provide reliable, customized and QoS (Quality of Service) guaranteed computing dynamic environments for end-users. Distributed processing, parallel processing and grid computing together emerged as cloud computing. The basic principle of cloud computing is that user data is not stored locally but is stored in the data center of internet. The companies which provide cloud computing service could manage and maintain the operation of these data centers. The users can access the stored data at any time by using Application Programming Interface (API) provided by cloud providers through any terminal equipment connected to the internet. In this module initialize the cloud system using multiple members such as cloud user, physical machine and virtual machine. Physical machine is responsible for allocate the resources in cloud system

2) SLA PREDICTION

SaaS providers lease enterprise software as hosted services to customers. They are interested in maximizing profit and ensuring QoS for customers to enhance their reputation in the marketplace. We consider the customers’ requests for the enterprise software services from a SaaS provider by agreeing to the pre-defined SLA clauses and submitting their QoS parameters. Customers can dynamically change their requirements and usage of the hosted software services. The SaaS provider can use their own infrastructure or outsourced resources from public IaaS providers. A service-level agreement (SLA) is a contract between physical machine and its users that documents what resources the physical machine will furnish and defines the performance standards. Input the SLA values to physical machine to allocate the resources. SLAs establish customer expectations with regard to the service provider's performance and quality in a number of ways. Some metrics that SLAs may specify include:

- Availability and uptime the percentage of the time services will be available.

- Specific performance benchmarks to which actual performance will be periodically compared.
- Application response time.
- The schedule for notification in advance of network changes that may affect users.
- Help desk response time for various classes of problems.
- Usage statistics that will be provided.

An SLA may specify availability, performance and other parameters for different types of customer infrastructure -- internal networks, servers and infrastructure components such as uninterruptable power supplies, for example.

3) VM MONITORING

In this module contains two sub modules such as VM prediction and Migration plan.VM prediction is used to know about the details of allocated spaces and free spaces in storage environments. And Migration plan is used to shift the control from one VM to another VM. The detection of Virtual and physical machines are always based on space threshold which are set by the data center owner or based on the Service Level Agreements specified by the clients. Usually, a higher resource usage value close to maximum is set as the upper threshold and a very low resource usage value is set as the lower threshold. PMs having resource usage values beyond the upper threshold are said to have formed hotspots, and whose usage values below the lower threshold are said to have formed server. The former implies over-utilization and the latter implies underutilization, applicable across any resource dimension.

4) CO-LOCATED VM APPROACH

In this module, analyze the pending small spaces in each VM. Check the user SLA with Available spaces. If the spaces are not enough means, combine pending spaces to create new VM space. Based on this consolidation, Physical machine allocate resources in new spaces. VMs refer to one instance of an operating system along with one or more applications running in an isolated partition within the computer. There will be multiple virtual machines running on top of a single physical machine. When one physical host gets overloaded, it may be required to dynamically transfer certain amount of its load to another machine with minimal interruption to the users. This process of moving a virtual machine from one physical host to another is termed as migration. In the past, to move a VM between two physical hosts, it was necessary to shut down the VM, allocate the needed resources to the new physical host, move the VM files and start the VM in the new host.

5) SELF-DESTRUCTION

In this module calculate the time to live variable to predict the validity of each user. If the validity date is end means, send alert before one day for extending the resource space. If user is extend the resources means, allocate space in VM machine otherwise eliminate all resources which are allocated in VM for users. A self-destruct method is used to delete the data from the cloud storage as per the rules defines. User specifies the survival time and data will be deleted from the cloud environment once the survival time is over. An active storage object that is derived from a user object and has the same set of rules for uploading the data on cloud. The set of rules are used to trigger the self-destruct operation. The values of a user object is infinite i.e. user object will not be deleted until a user deletes it manually. The time-to-live value of an active storage object is limited so an active object will be deleted when the value of the associated Policy object is true.

VI. SCREENSHOTS

Figure 4 : AdminLogin

Figure 5 : welcome pages

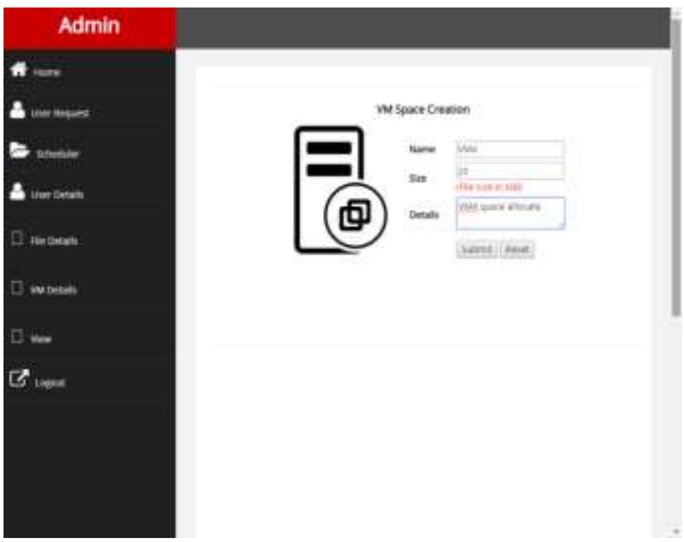

Figure 6 : enter pages.

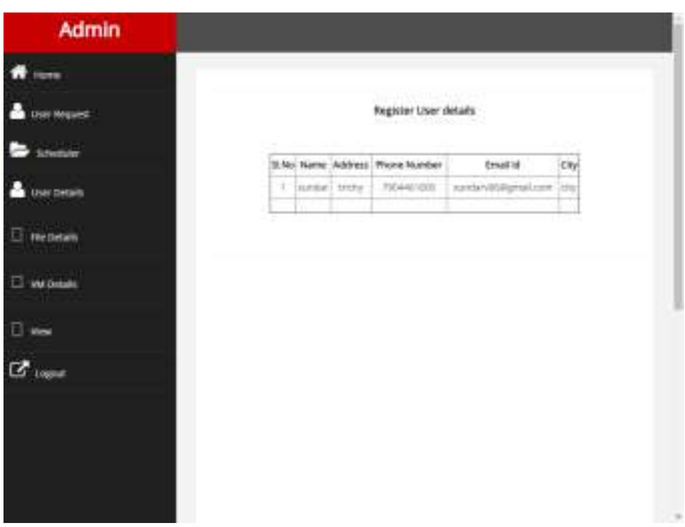

Figure 7: dataset of VM files

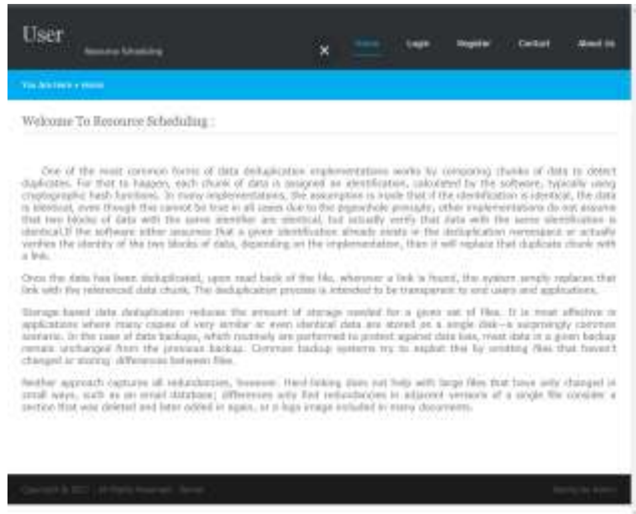

Figure 8 : Cloud storage data.

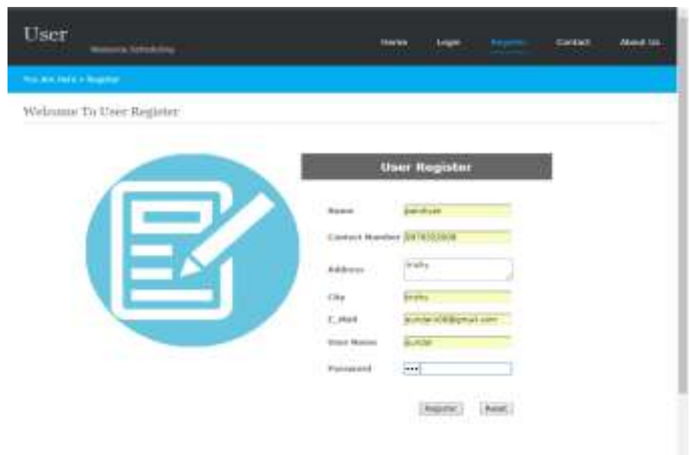

Figure 9 : User register

VII. CONCLUSIONAND FUTURE ENHANCEMENT

A Resource Allocation System (RAS) in Cloud Computing can be seen as any mechanism that aims to guarantee that the applications' requirements are attended to correctly by the provider's infrastructure. Along with this guarantee to the developer, resource allocation mechanisms should also consider the current status of each resource in the Cloud environment, in order to apply algorithms to better allocate physical and/or virtual resources to developers' applications, thus minimizing the operational cost of the cloud environment. Our system multiplexes virtual to physical resources adaptively based on the changing demand. We use the Migration method to combine VMs with different resource characteristics appropriately so that the capacities of servers are well utilized. Proposed algorithm achieves both overload avoidance and green computing for systems with multi resource constraints.

FUTURE ENHANCEMENT

In future the work can be extended to implement the proposed approach in a and implement various VM provisioning scheduling approaches to improve the energy consumptions

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