



ENERGY-EFFICIENT TASK OFFLOADING BASED ON KNN AND NAIVE BAYES WITH ENERGY HARVESTING

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Abstract - Virtual Machines are scheduled to hosts in Cloud architectures based on their immediate useful resource use rather than their usual and long-term usage. In many circumstances, scheduling and site procedures are computationally expensive and have an impact on the overall performance of deployed virtual machines. In this work, a Cloud VM scheduling set of rules is presented that takes into account previously established VM useful resource use over time by analysing beyond VM usage ranges in order to time table VMs while improving overall performance by employing the KNN and Naive Bayes category approach. The Euclidean distance of KNN is measured after which digital gadget is scheduled at the bodily gadget. The Cloud control techniques, like VM placement, have an effect on already deployed structures so the purpose is to limit such overall performance degradation. Moreover, overloaded VMs generally tend to thief sources from neighboring VMs, so the painting maximizes VMs actual CPU usage. The idea of VM scheduling consistent with useful resource tracking statistics extracted from beyond useful resource utilizations (which includes PMs and VMs). When K-NN & NB classifiers are used instead of Support Vector Machine (SVM) classifiers, the physical device's dependability is reduced. The undertaking accomplished with the aid of using 28 bodily machines while the use of SVM is decreased with the aid of using 24 bodily gadgets with the aid of using the use of KNN & NB classifier set of rules additionally the mistake costs receives reduced with the aid of using 0.025%.

I.INTRODUCTION

Cloud Computing is the following era computational paradigm. It is unexpectedly consolidating itself because the destiny of dispensed on-call for computing. By the usage of the idea of virtualization, Cloud Computing is rising as important spine for the kinds of net businesses. On the opposite hand, Internet enabled enterprise (eBusiness) is turning into one in all quality enterprise version in gift era. To satisfy the want of net enabled enterprise, computing is being converted to a version such as offerings which are commoditized and introduced in a way just like conventional utilities together with water. Users can gain access to offerings based on their requirements, regardless of where the products are housed or how they're distributed. This software computing has been promised by a number of computer paradigms. Cloud computing is one such dependable computing paradigm. Cloud computing structure includes the front give up and a lower back give up. These ends are related with the aid of using Internet or Intranet. The front give up accommodates of purchaser gadgets like skinny purchaser, fats purchaser or cell gadgets etc. The customers want a few interface and packages for gaining access to the cloud computing system[1]. The lower back give up includes the numerous servers and statistics garage systems. There is likewise a server called "Central Server". A crucial server is used for administering the cloud system. It additionally video display units the general visitors and satisfying the purchaser needs in actual time. Virtualization is the abstraction of bodily network, server, and garage sources and it has substantially improved the capacity to make use of and scale compute strength. It is an era that lets in



jogging or greater running structures aspect-through- aspect on simply one private pc or embedded controller. Virtualization substantially facilitates in powerful usage of sources and builds a powerful device. Many programs are having a restrained quantity of concurrent tasks, for this reason having some of unused (idle) cores. This trouble may be solved through the usage of virtualization, allocating a collection of cores to an Operating device which can run it concurrently.

It allows the carrier vendors to provide digital machines (VMs) for paintings in place of the bodily machines (PM). It paperwork the premise of Cloud computing on-demand, pay-as-you-cross model. The PM is likewise referred to as Host or Server. The VMs are referred to as guests. The servers behave like PMs. Each device makes use of a specific method to allocate bodily server sources to digital server desires. Virtualization is a era that separates computing features and implementations from bodily hardware. Now virtualization has come to be the muse of Cloud Computing, because it allows isolation among hardware and software program, among customers, and among procedures and sources. With virtualization, software program able to execution at the uncooked hardware may be run in a digital environment.

User's useful resource requests are packed as VMs after which located in specific PMs primarily based totally on precise criteria, which includes assembly the Service Level Agreement (SLA) [2] necessities among cloud vendors and cloud customers, improving the sources usage, lowering the quantity of VM migrations and so on. Each VM in PM desires a positive quantity of sources like CPU, memory, garage and bandwidth, to guide utility performance.

Virtualization facilitates to enhance useful resource usage, scalability, lowering the lively customers and decrease power intake. Moreover, virtualization additionally facilitates cloud vendors to orderly installation sources on-demand, which affords a powerful approach to the bendy useful resource control and coffee power usage. However, nugatory VM migrations introduce greater control cost, e.g., VM reconfiguration, on line VM migration, and advent and destruction of VMs, which reasons greater power intake. Therefore, we strive to lessen the quantity of VM migrations to lessen power intake. Virtualization additionally facilitates in lowering strength intake through lowering the quantity of PMs because it affords some of VMs according to PMs and on this manner facilitates in powerful usage of sources. Migration of VMs this means that to switch a VM from one to any other PMs facilitates in substantially lowering the power intake.

II. RELATED WORK

The idea of VM scheduling consistent with aid tracking records extracted from beyond aid utilizations (inclusive of PMs and VMs) and the aid records are categorized the use of the optimization strategies K-NN and NB, consequently acting the scheduling. A type version tries to attract a few

end from found values. Given one or greater inputs a type version will try and expect the fee of 1 or greater outcomes. Outcomes are labels that may be carried out to a dataset. There are processes to system learning: supervised and unsupervised. In a supervised version, a schooling dataset is fed into the type algorithm. The okay-nearest neighbor's method (okay-NN) is a type of regression nonparametric technique. In each case, the entry contains the most appropriate nearby schooling examples inside the characteristic space. Whether or not okayNN is used for type affects the result.

This work was proposed by Yong Yu et al. RDIC allows a records storage server, such as a cloud server, to demonstrate to a verifier that it is merely keeping a records owner's records honestly. To far, numerous RDIC protocols have been presented in the literature; however, the majority of the structures suffer from a key management problem, i.e., they rely on expensive public key infrastructure (PKI), which may limit RDIC implementation in practise. In this research, we propose a novel identity-based (IDbased) RDIC protocol that makes use of keyhomomorphic cryptographic primitives to reduce the device complexity and cost of setting up and managing the general public key authentication framework in PKI-based RDIC schemes.

We formalise ID-based RDIC and its protective version, which includes security against a rogue cloud server and 0 information privacy to a third party verification. During the RDIC process, the proposed ID-based RDIC protocol does not provide any information about the stored data to the verifier. The new production is stable against the malicious server inside the regularly occurring institution version and achieves 0 information privacy to a verifier. Extensive security testing and implementation results reveal that the suggested protocol is both provably stable and practical in realworld applications.

Usman Wazir et.al has proposed this paper Cloud computing offers allotted assets to the customers globally. Cloud computing carries a scalable structure which offers on-call for offerings to the companies in specific domains. However, there are more than one demanding situations exists withinside the cloud offerings. Different strategies have been proposed for specific type of demanding situations exists withinside the cloud offerings. This study examines the unique designs recommended for SLA in cloud computing, with the goal of overcoming the difficult scenarios that might arise in SLA. Performance, Customer Level Satisfaction, Security, Profit, and SLA Violation challenges. In cloud computing, we discuss SLA structure. Then we discuss current SLA styles in various cloud carrier types such as SaaS, PaaS, and IaaS. With the use of tables, we discuss the benefits and limitations of cutting-edge trends in the next part. We summarise and provide a conclusion in the final part.



This work was proposed by Evrim Furuncu et al. Cloud computing is one of the most well-known data processing concepts in today's IT industry. Because each carrier version makes use of a different set of infrastructure features, cloud computing security is complicated. Current security risk assessment models can't always be used to cloud computing systems that extract their statuses quickly. As a solution to this problem, a scalable security risk evaluation model for cloud computing has been developed in this paper using recreation theory. Using this method, we'll see if the risk inside the device should be constant via the cloud issuer or the device's tenant. Cloud computing has been increasingly popular among businesses in recent years as a method of delivering new services, entering new markets, reaching out to customers, and lowering IT operating expenses. In general, cloud computing is defined as the use of all other computers' resources as a carrier, which is accomplished through the usage of a network.

Because of technological advancements in broadband connections, average Internet users may now apply for cloud computing. Cloud computing's rapid evolution also carries with it security concerns. The cost and gain of attackers and defenders are no longer included in today's risk evaluation methodologies for cloud computing. Our artwork aims to alleviate the difficulty of locating a really ideal technique to implementing security measures while using cloud computing. The suggested method employs the recreation concept to simulate the defence and attacker's final outcomes.

We evaluate the defender's optimum strategy based on the asset price as seen through the perspective of the cloud issuer and the risks that the asset may face. Our model may be improved by computing unique threats at the same time and putting those numbers into a response matrix. We will compute one-of-a-kind safety measures using this method, [12] which might reduce the same type of threats.

III. PROPOSED SYSTEM

The purpose is to promote the notion of VM scheduling based on aid tracking records recovered from beyond aid utilizations, and to investigate the beyond VM usage tiers using the type method, as well as K-NN and NB, in order to time table VMs while improving overall performance. The proposed VM scheduling set of rules adds to the VM selection segment, which is based on real-time data gathering and evaluation of physical and digital resources. Our goal is to strengthen VM scheduling so that standards connected with genuine VM consumption tiers can be contained, and VMs can be positioned by reducing the penalty of standard overall performance tiers. The flow diagram depicts the design of the proposed system (Figure 1).

A. Cloud formation

Using cloudsims, this module produces cloud environments. One data centre and a few of biological machines make up the environment (PM). Instance Type, CPU, Memory, and Bandwidth are the four factors that make up each PM. PM Selection In this module, the best PMs for scheduling the VM are chosen. For PM, a binary matrix is created. If it is considerably more appropriate to host a VM, the value '1' is assigned to PM; otherwise, the value '0' can be assigned. For example, if the VM requires five GB of RAM, all PMs with additional or equivalent memory can be selected. The cloud formation is depicted in the Figure 2.

B. VM Scheduling

The set of criteria supplements the VM selection section, which is based on real-time data gathering and evaluation of physical and digital resources. Our goal is to improve VM scheduling. To contain standards related with real VM usage tiers, VMs can be located by limiting the penalties associated with typical overall performance tiers. The optimization strategies include (a) increasing utilization tiers and (b) lowering overall performance losses. The Optimization Scheme is depicted in the Figure 5. A tracking engine that allows for online help use data collection from virtual machines. The engine can capture machine data based on a c programming language period and save it to an online cloud provider, where it may be used for data processing. Data is collected every c program language second (for example, 1 second) and saved in a temporary neighbor-hood file. The VM scheduling is depicted in the Figure 3.

C. Classification Algorithm

When supervised machine learning techniques are used to classify data, it is preferable to use a classified dataset as the input dataset. Method of KNearest Neighbors • K-nearest friends is a straightforward collection of rules that stores all available examples and categorizes new instances based on a similarity criterion (e.g., distance functions). In statistical estimation and sample recognition, K-NN has been used. A non-parametric approach for classification and regression is the knearest neighbor's set of rules (k-NN). The method of Naive Bayes (NB).

The Bayesian Classifier is capable of calculating the most feasible output based entirely on the Centre. It is also possible to include additional raw data and a more probabilistic classifier at runtime. While the magnificence variable is supplied, a naïve Bayes classifier thinks that the existence (or lack) of a selected characteristic (attribute) of a category is independent to the presence (or absence) of every other characteristic. For example, a fruit can be considered an apple if it is bright red and circular. Even if those capabilities are reliant on one another or on the lives of distinct capabilities within a category, a naïve Bayes classifier considers each of those houses to contribute to



the likelihood that this fruit is an apple on its own. The Classification is depicted in the Figure 4.

D. VM Resource monitoring process VM Scheduling

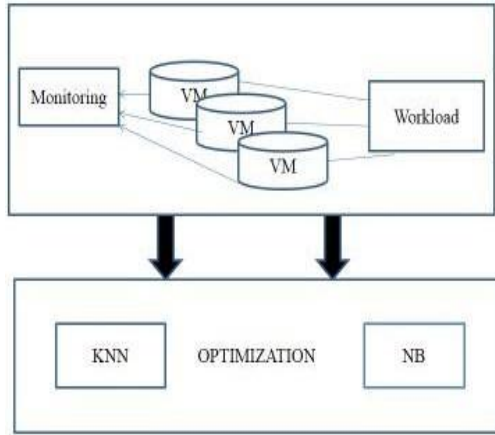


Figure 1. Block Diagram

E. Performance Evaluation

The absolute error is defined as the absolute value of the difference between the measured value and the true value. Thus, let:

e_a = Absolute error

x_m = Measured value

x_t = True value

Computing absolute error is obtained by using the below formula:

$$e_a = |x_m - x_t|$$

IV.OUTPUT

The following figures depicts the cloud formation, VM scheduling, Classification and Optimization Scheme in the Figure 2, Figure 3, Figure 4 and Figure 5 respectively.

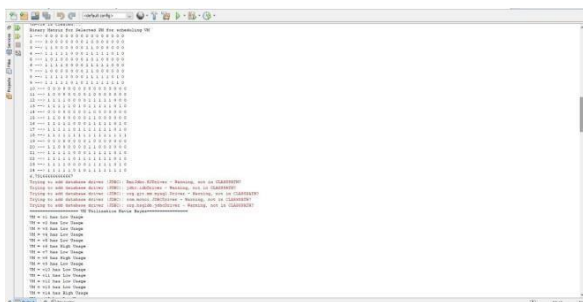


Figure 2. Cloud formation

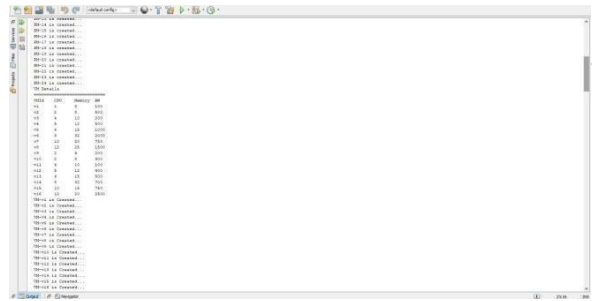


Figure 3. VM Scheduling

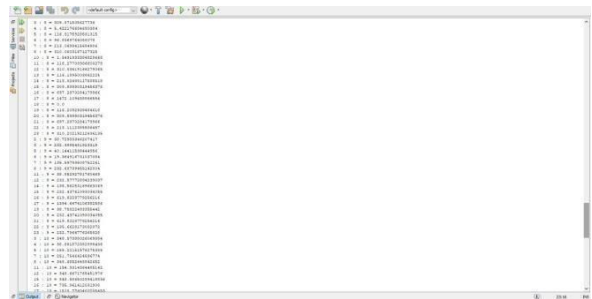


Figure 4. Classification

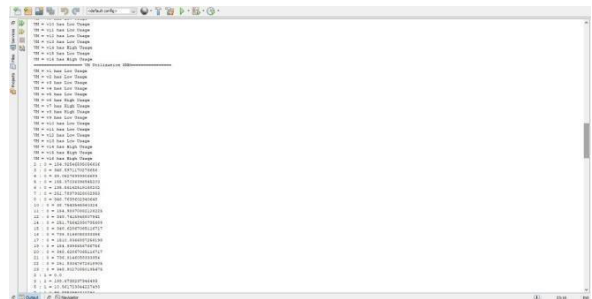


Figure 5. Optimization Scheme

V. RESULTS AND DISCUSSION

The focus is on clouds, which are open source software that may be used to build public clouds. As a result of this behaviour, effective pms within the stack are overloaded, leaving low ram pms underutilized. Also, by developing a system learning model that analyses pms and vms aid use on-the-fly, the assistance analytics are mostly based on beyond aid utilization.

Virtual machines that are scheduled are to hosts consistent with the spontaneous aid utilization (e.g. To hosts with maximum to be had ram) without thinking about their common and long-time period usage. Also, in lots of cases, the scheduling and location strategies are computational high-priced and have an effect on overall performance of deployed vms. Thus the conventional vm



placement set of rules does now no longer remember beyond vm aid usage ranges. To triumph over this vm scheduling set of rules is implemented. The idea of vm scheduling consistent with aid tracking statistics extracted from beyond aid utilizations (such as pms and vms) and the aid statistics are labeled the use of the optimization strategies k-nn and nb, as a consequence acting the scheduling. The set of rules evaluates beyond aid usage ranges and classifies consistent with the general aid utilization.

VI. CONCLUSION

Different digital device placement algorithms had been used for scheduling through deciding on bodily machines in step with the device information (i.e. Utilization of CPU, memory, bandwidth) in cloud device. The gift vm placement would not consider of actual time vm aid usage tiers. Here we a brand new vm placement set of rules primarily based totally on beyond vm utilization studies is proposed then the vm utilization is monitored and the information receives educated the usage of device gaining knowledge of fashions (K-NN&NB) to calculate the prediction of the vm aid utilization, to area VMs accordingly. A set of rules that permits vm placement in step with pm and vm utilization tiers and computational gaining knowledge of technique primarily based totally at the idea of analysing beyond vm aid utilization in step with ancient statistics to optimize the pm choice section changed into delivered. Also, a vm placement set of rules primarily based totally on actual time digital aid tracking changed into delivered in which device gaining knowledge of fashions is used to educate and research from preceding digital device assets utilization. Thus, a tracking engine is believed with aid utilization information. The rely of the bodily device receives decreased through four through the usage of KNN & NB classifier than support vector machine (SVM) classifier. The venture finished through 28 bodily machines while the usage of SVM is decreased through 24 bodily machines through the usage of KNN & NB classifier set of rules additionally the mistake quotes receives decreased through 0.025%. The proposed painting permits information processing primarily based totally on a time frame window to outline the pms or vms real behavior. In case of vm placement method, end result highlights the essential improvements. The destiny studies paintings can be accomplished with similarly experimentation applicable to numerous gadget studying fashions like random forest, selection timber to enhance the performance.

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