Improve Cloud Base Wi-Fi Network using Load Base Mobile Cloud Computing Model

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Abstract - People show attention to cloud computing since it is efficient and scalable. But maintaining the stability of processing so many jobs in the cloud computing environment with load balancing is a very difficult problem and receives much attention by researchers. Load balancing in cloud computing platform has performance impact also. Good load balancing makes cloud computing more efficient and increases user satisfaction. This paper introduces a better load balance model for public cloud based on cloud partitioning concept with a switch mechanism to choose various strategies in different situations. The algorithm applies game theory to load balancing strategy and improves the efficiency in the public cloud environment MCC is a concept which aims to mitigate these limitations by extending the capabilities of smart devices by employing cloud services, as required. In MCC both the data storage and processing occur external to the mobile device, while in cloud computing it is usually only the data storage which is external. In this following a some of these architectures as categorized in augmented execution, elastic partitioned/modularized applications, application mobility, ad-hoc mobile cloud and add a fifth category; cyber foraging. This system addresses whether MCC techniques can be used to extend the capabilities of resource-constrained mobile-devices to provide the illusion of infinite, elastic resources on demand. The existing system limitations of mobile-devices, and identified five key limited resources as being CPU, memory, battery, data usage and time. In this research explored existing solutions for these limitations and identified offloading computation and storage from the device as a possible solution.

Keywords - Mobility, load balancing, MCC, cyber foraging

I. INTRODUCTION

Cloud computing is internet-based computing during which massive teams of remote servers area unit networked to permit sharing of data-processing tasks, centralized information storage, and on-line access to pc services or resources. Clouds are classified as public, non-public or hybrid. Cloud computing may be a form of computing that depends on sharing computing resources instead of having native servers or personal devices to handle applications. The most sanctioning technology for cloud computing is virtualization. Virtualization computer code permits a physical computer to be electronically separated into one or additional "virtual" devices, every of which may be simply used and managed to perform computing tasks. Cloud computing adopts ideas from Service directed design (SOA) that may facilitate the user break these issues into services that may be integrated to supply an answer. Cloud computing provides all of its resources as services, and makes use of the well-established standards and best practices gained within the domain of SOA to permit world and simple access to cloud services in an exceedingly standardized method.

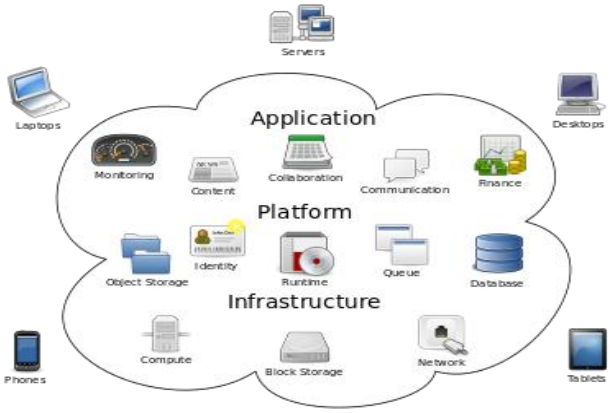

Fig. 1 Cloud Computing

Cloud computing may be a quite grid computing; it's evolved by addressing the QoS (Quality of Service) and responsibleness issues. Cloud computing provides the tools and technologies to make data/compute intensive parallel applications with rather more reasonable costs compared to ancient parallel computing techniques.

II. CHARACTERISTICS

Cloud computing exhibits the following key characteristics

- Agility
- Application programming interface
- Cost reductions
- Device and location independence
- Maintenance
- Multitenancy
- Performance
- Productivity
- Reliability and Scalability
- Security

Cloud computing is dominated by

- Amazon Web Services (AWS),
- Google Compute Engine, Google App Engine
- Microsoft Azure
- There are many small and medium scale cloud operators that include IBM, Oracle etc.

The internet of Things is setting out to rework daily tasks area unit completed. the net of Things (IoT) consists of everyday objects – physical devices, vehicles, buildings etc. with embedded natural philosophy, software, sensors, and network property, permitting them to gather, send and receive knowledge. The IoT generates a massive quantity of huge knowledge and this successively puts a large strain on web Infrastructure. As a result, this forces corporations to search out solutions to minimize the pressure and solve their drawback of transferring massive amounts of knowledge. Cloud computing has entered the thought of knowledge technology, providing quantifiability in delivery of enterprise applications and software system as a Service (SaaS). Corporation area unit currently migrating their data operations to the cloud. Several cloud suppliers will yield your knowledge to be either transferred via your ancient web association or via a passionate direct link. The advantage of an on the spot link into the cloud can make sure that your knowledge is uncontended which the traffic isn't crossing the net and also the Quality of Service are often controlled.

III. RELATED WORKS

A. Niroshinie Fernando , Seng W. Loke , Wenny Rahayu

Despite increasing usage of mobile computing, exploiting its full potential is troublesome thanks to its inherent issues like resource scarceness, frequent disconnections, and quality. Mobile cloud computing will address these issues by corporal punishment mobile applications on resource suppliers external to the mobile device. During this paper [1], to produce an intensive survey of mobile cloud computing analysis, whereas lightness the precise considerations in mobile cloud computing. this taxonomy supported the key problems during this space, and discusses the various approaches taken to tackle these problems. To conclude the paper with a assessment and challenges that haven't nevertheless been absolutely met, and highlight directions for future work.

The increasing usage of mobile computing is clear by the study by Juniper analysis that states that the buyer and enterprise marketplace for cloud-based mobile applications is anticipated to rise to $9.5 billion. In recent years, applications targeted at mobile devices have started changing into plentiful with applications in numerous classes like amusement, health, games, business, social networking, travel and news. The recognition of those are evident by browsing through mobile app transfer centers like Apple’s iTunes or Nokia’s Ovi suite.

B. Dejan Kovachev, Yiwei Cao and Ralf Klamma

Cloud computing is an rising construct combining several fields of computing. the inspiration of cloud computing is that the delivery of services, computer code and process capability over the net, reducing price, increasing storage, automating systems, decoupling of service delivery from underlying technology, and providing flexibility and quality of knowledge. However, the particular realization of those edges is much from being achieved for mobile applications and open several new analysis queries. In order to higher perceive the way to facilitate the building of mobile cloud-based applications, they need surveyed existing add mobile computing through the prism of cloud computing principles. The given definition of mobile cloud computing and supply an outline of the results from this review, specially, models of mobile cloud applications. To focus on analysis challenges within the space of mobile cloud computing. To conclude with recommendations for a way this higher understanding of mobile cloud computing will facilitate building a lot of powerful mobile applications.

C. HanQi , Abdullah Gani

Mobile Cloud Computing (MCC) which mixes mobile computing and cloud computing, has become one amongst the trade buzz words and a serious discussion thread within the IT world since 2009. As MCC continues to be at the first stage of development, it's necessary to understand a radical understanding of the technology so as to entails the direction

of future analysis. With the latter aim, this paper presents a review on the background and principle of MCC, characteristics, recent analysis work, and future analysis trends. a quick account on the background of MCC: from mobile computing to cloud computing is given and so followed with a discussion on characteristics and up to date analysis work. It then analyses the options and infrastructure of mobile cloud computing.

D. Preeti Garg, Vineet Sharma

Describes a cloud computing extremely climbable computing resources are equipped as associate outer service through net on pay-as-usability basis. Portio analysis estimates that mobile subscribers can reach half dozen.5 billion by the tip of 2012, 6.9 billion by the tip of 201 three. thanks to increasing use of mobile devices the necessity of cloud computing in mobile devices arise, that gave birth to Mobile Cloud Computing (MCC). Mobile Cloud Computing refers to associate infrastructure wherever processing and storage will happen faraway from mobile device. Mobile devices don't have to have massive storage capability and powerful electronic equipment speed. Thanks to storing information on cloud there's associate issue of information security. as a result of the chance related to information storage several IT professionals aren't showing their interest towards Mobile Cloud Computing. This paper[10] explores: (i) The thought of Mobile Cloud Computing and problems associated in it (ii) Security of information hold on in cloud with varied mechanisms (iii) projected a attainable answer to supply confidentiality, access management similarly as integrity of information.

E. Byung-Gon Chun, Sunghwan Ihm, Petros Maniatis

Describe a mobile applications are becoming increasingly ubiquitous and provide ever richer functionality on mobile devices. Meanwhile, such devices often enjoy strong connectivity with more powerful machines ranging from laptops and desktops to commercial clouds. This paper presents the design and implementation of Clone Cloud, a system that automatically transforms mobile applications to benefit from the cloud. The system is a flexible application partitioned and execution runtime that enables unmodified mobile applications running in an application-level virtual machine to seamlessly off-load part of their execution from mobile devices into device clones operating in a computational cloud. Clone Cloud uses a combination of static analysis and dynamic profiling to partition applications automatically at a fine granularity while optimizing execution time and energy use for a target computation and communication environment. During runtime, application partitioning is achieved by migrating a thread from the mobile device at a chosen point to the clone in the cloud, executing there for the residue of the partition, and re-integrating the migrated thread back to mobile. Their evaluation shows that Clone Cloud can adapt application partitioning to different environments, and can help some applications achieve as much as a 20x execution speed- up and a 20-fold reduce of energy spent on mobile.

F. Weiming Zhao

Virtualization primarily enables multiple operating systems and applications to run on one physical pc by multiplexing hardware resources. A key motivation for applying virtualization is to enhance hardware resource utilization while maintaining affordable quality of service. However, such a goal cannot be achieved while not economical resource management. The most physical resources, like processor cores and I/O devices, are shared among virtual machines exploitation time slicing and are often scheduled flexibly supported priority, allocating an acceptable quantity of main memory to virtual machines is tougher. Totally different applications have different memory needs. Even one application shows varied operating set sizes throughout its execution. A best memory management strategy below a virtualized environment therefore has to dynamically alter memory allocation for every virtual machine that more needs a prediction model that forecasts its host physical memory wants on the fly. This paper introduces Memory Balancer (MEB) that dynamically monitors the memory usage of every virtual machine, accurately predicts its memory wants, and sporadically reallocates host memory. MEB uses 2 effective memory predictors that, severally, estimate the number of memory accessible for reclaiming while not a notable performance drop, and extra memory needed for reducing the virtual machine paging penalty. The advantage of this study is that the swap usage from the OS performance statistics and posts the swap usage statistics to the central information storage. The limitation of this study is reducing overhead while up prediction accuracy.

G. Weizhe Zhang et al

Cloud computing emerges as a brand new computing paradigm involved by each domain and trade. Resource management of multiple virtual machines is that the core of Infrastructure as a Service. Specializing in the mainframe resources, the aim of this paper is to extend the QoS of net service by properly planning the mainframe resource across the virtual machines. The authors of this study formulate the mainframe planning of multiple virtual machines into an whole number programming drawback. Then, a worldwide regulation algorithmic rule supported utility optimization theory is planned. It principally consists of 4 parts: the monitor, the regulator, the native effectiveness of management and therefore the international effectiveness of management. The regulator is within the Xen virtual machines' monitor. The monitor, native effectiveness of management and therefore the net server are settled in DomainU's interior. The international effectiveness of management is created of the worldwide utility generating module and global optimizing and finding module, realized in the Domain0. Monitor: the most role of monitor is to discover an internet server QoS metrics, in the text it means that the typical latency of net. In their experimental environment Apache module was

developed for the Apache server to record period of time server latency. Additionally, we have a tendency to monitor the changes of the system resources. It's principally to try to do some tests for proc CPUinfo, and procure the condition of the system mainframe etc.

H. Christopher Clark et al

Migrating software package instances across distinct physical hosts may be a useful gizmo for directors of knowledge centers and clusters: It permits a clean separation between hardware and computer code, and facilitates fault management, load equalization, and low-level system maintenance. By finishing up the bulk of migration whereas OSes still run, atuhors reach spectacular performance with stripped-down service downtimes; the study demonstrate the migration of entire OS instances on a artifact cluster, recording service downtimes as low as 60ms. And also the author shows that that our performance is adequate to create live migration a sensible tool even for servers running interactive hundreds. During this paper, the look choices for migrating OSes running services with aliveness constraints, specializing in knowledge center and cluster environments is taken into account.

The administrator selects a minimum and a most information measure limit. The primary pre-copy spherical transfers pages at the minimum information measure. Every resultant spherical counts the quantity of pages dirtied within the previous spherical, and divides this by the length of the previous spherical to calculate the soiling rate. The information measure limit for consecutive spherical is then determined by adding a relentless increment to the previous round's soiling rate have by trial and error determined that 50Mbit/sec may be a appropriate worth. It terminates pre-copying once the calculated rate is bigger than the administrator's chosen most, or once but 256KB remains to be transferred. By integration live OS migration into the Xen virtual machine monitor we tend to alter speedy movement of interactive workloads at intervals clusters and knowledge centers. The dynamic network-bandwidth adaptation permits migration to proceed with stripped-down impact on running services, whereas reducing total time period to below discernible thresholds. Feature of this study is moving the contents of a VM's memory from one physical host to a different is approached in any range of how. And also the limitation may be a live service it's vital that this transfer happens in a very manner that balances the necessities of minimizing.

I. Albert M.K. Cheng et al

Describe a Virtualization technology recently becomes a hot analysis topic once more in each business and teachers. Some physical hardware like processors and I/O devices area unit shared among virtual machines victimization time slicing, however the memory resource management is comparatively sophisticated. Light-weight memory management design for multiple virtual machines is projected, and it includes a mix of self adjustment and global-adjustment policies, each of that collaborate with one another to boost the memory potency. IC module: it consists of 2 parts: Virtual Machine Collector (VMC) and Physical Machine Collector (PMC). VMC is found in DomainU, accountable for aggregation every domain's memory usage and disc space usage statistics. PMC is put in at Domain0 to gather the scale of total and idle memory within the physical machine, etc. Regulator module: it's accountable to control resources. The authors used Balloon-Driver as a restrictive mechanism of memory to trigger the memory rescaling and XenStore to exchange knowledge between varied domains.

PM module: it's the core of the system. If the resource is decent, memory sizes area unit adjusted by the VMs themselves that is named self-adjustment. Otherwise, the global-adjustment is activated for the complete memory management consistently. Following area unit the benefits of this study: Self-adjustment is running as a daemon method once the OS of a particular domain starts.

J. Tudor-Ioan Salomie, Gustavo dancer, Timothy Roscoe

Describes a program like databases and language runtimes usually manage memory themselves to use application information out of stock to the OS. Historically deployed on dedicated machines, they're designed to be statically designed with memory comfortable for peak load. In virtualization eventualities (cloud computing, server consolidation), however, static peak provisioning of RAM to applications dramatically reduces the potency and cost-saving edges of virtualization.

IV. METHODOLOGY

The Paper describes the choices to synchronize the offline folder contents to the online. Word documents, surpass worksheets and alternative files is designated and uploaded to the online application. Additionally, they'll be reborn into bytes and saved within the info provided within the net server location. In anyplace, the administrator will read the contents within the server choose a file and transfer to the system where the administrator is functioning. Likewise, the files are uploaded from the online page additionally. The windows application is wont to transfer the content from the online website to the native machine. So the applying synchronizes the online content and windows content. The applying acts like content storage also as document version manager. Likewise, all the documents square measure keep in info additionally with the name, the system from that it's uploaded, the information and time of uploading also because the original file copy is additionally unbroken within the server. The files uploaded from the system in foreign places apart from the native workplace if presents within the information processing system, then the administrator are intimated

specified some files gift within the information processing system isn't downloaded to the native system. This helps the administrator to synchronize the document expeditiously. The system is implemented with the following methods:

- Augmented Execution
- Elastic/Partitioned Modularized Applications
- Ad-hoc Mobile Cloud
- Application Mobility
- Cyber Foraging

Resource-intensive tasks can be relegated to the cloud or other resources such that the mobile device constraints are mitigated. In MCC both the data storage and processing occur external to the mobile device, while in cloud computing it is usually only the data storage which is external.

A. Increased Execution

Processes on mobile devices area unit offloaded to the cloud so as to beat good device limitations, like process power, battery life and memory. During this module thought-about the restricted Memory-Client/ Excessive Memory-Server. the first practicality outsourcing (intensive computation is offloaded), background augmentation (processes that don't need user interaction area unit offloaded), inject augmentation (changes within the execution path may be offloaded), hardware augmentation (augmentation of underlying platform) Association augmentation through multiplicity (running multiple parallel copies of an application to create optimum decisions). The computationally overpriced tasks area unit full to an online service containing image of the device, whereas straightforward tasks area unit unbroken on the device. Once the net service in cloud task completes the execution, results area unit integrated back to the mobile node.

B. Elastic/Partitioned Modularized Applications

Some of the processes are dealt in shopper and remaining process area unit are dealt from the server. The applications area unit partitioned off into elements such these may be remotely dead severally on a cloud. With static partitioning, applications area unit partitioned off into mounted elements throughout compile time or runtime. In distinction, Dynamic partitioning is that the partitioning of applications at runtime, sporadically (on interval basis) or nonchalantly. Dynamic configuration supported factors like CPU standing, memory, power, bandwidth and user preferences determines wherever an application is run; whether or not on the device or within the cloud server.

C. AD-HOC Mobile Cloud

In Ad-hoc Mobile Cloud, the given task by a mobile node, the method execution is happened within the shopper if the server is unavailable. Ad-hoc mobile cloud may be a set of mobile devices that replace the cloud infrastructure by providing their computation resources to different devices. Mobile devices have storage, procedure power, battery power and sensing capabilities, that provides a chance for exploiting the collective power of those devices. This is often particularly helpful in things wherever there's very little or no affiliation to the network, restricted power (short vary communications consume less energy).

D. Application Quality

Application quality relies on the idea of method migration, whereby processes may be paused, transferred to a distinct machine and seamlessly resumed. The distinction between this and increased Execution is that in application quality, migration will occur between completely different underlying mobile architectures. The applying quality, one method is dead in client/ different method is processed within the server that is Cloud choice based mostly. it's engineered on a distributed filing system, that support the transmission of state from one web site to a different, and also the modification in state from suspend to resume or contrariwise. The purchaser's area unit that internets suspend / resume have association asynchronous dependence on the network, whereas purchasers would historically be synchronously captivated with the network.

E. Cyber Hunting

The process or the given task of a node is partly dead in an un-trusted server. It's a way whereby proximate offered resources (called surrogates) area unit used for remote execution of applications. These resources area unit dynamically discovered and used notwithstanding the servers don't seem to be expressly trustworthy by the user. Surrogates area unit supported 2 main premises; un-trusted and unmanaged. This reduces the overall price of possession and maintenance and so encourages their broad adoption. The offload tasks to a distant server area unit supported many factors together with computation quality, network strength, and device capability and information neighborhood.

V. CONCLUSION

Through this analysis, the information management method becomes straightforward. All the regular activities square measure assigned to them through browser interface. The administrator will read the contents within the server choose a file and transfer to the system where the administrator is functioning. Likewise, the files may be uploaded from the online page additionally terribly straightforward manner. The new system eliminates the difficulties within the existing system. It's developed in a very easy manner. The system is incredibly quick and any dealings may be viewed or retaken at any

level. Error messages square measure given at every level of input of individual stages. Several of the tested practices and technologies for managing trust relationships in ancient enterprise IT environments may be extended to figure effectively in each non-public and public cloud.

Furthermore, to gauge a best help in document management, the application become helpful if the below enhancements square measure created in future. If the appliance is meant as internet service, it may be integrated in several internet sites. Non-synchronized documents may be alerted to synchronize. the appliance is developed specified on top of aforementioned enhancements may be integrated with current method.

REFERENCES

[1] N. Fernando, S. W. Loke, and W. Rahayu, "Mobile cloud computing: A survey," Future Generation Computer Systems, vol. 29, no. 1, pp. 84-106, 2015.

[2] D. Kovachev, Y. Cao, and R. Klamma, "Mobile cloud computing: a comparison of application models," arXiv preprint arXiv:1107.4940, 2012.

[3] [H. Qi and A. Gani, "Research on mobile cloud computing: Review, trend and perspectives," in Digital Information and Communication Technology and it's Applications, 2nd Intl. Conf. on IEEE, 2012, pp. 195-202, 2012.

[4] Preeti Garg, Dr. Vineet Sharma, "Secure Data Storage In Mobile Cloud Computing," in Computer Communications Workshops (INFOCOM WKSHPS), 2011 IEEE Conference on . IEEE, 2014, pp. 1060–1065.

[5] Byung-Gon Chun , Sunghwan Ihm, Petros Maniatis, "Securing elastic applications on mobile devices for cloud computing," in Proc. ACM workshop on Cloud computing security, ACM, pp. 127-134, 2016.

[6] Weiming Zhao, "Dynamic Memory Balancing for Virtual Machines", 14th Intl. Conf. on Modeling and Simulation, 2016.

[7] Weizhe Zhang C. Wang, K.Q. Yan, W.P. Liao and S.S. Wang, Multiple Virtual Machines Resource Scheduling, in Proc. 3rd IEEE Intl. Conf. Computer Science and Information Technology, pp. 108-113, 2015.

[8] Christopher Clark , H. Jamal, A. Nasir, K. Ruhana, K. Mahamud and A.M. Din, Live Migration of Virtual Machines, Proc. 2nd Intl. Conf. Computational Intelligence, Modeling and Simulation, pp. 160-165, 2014.

[9] Albert M.K. Cheng, R. Subrata, and A.Y. Zomaya, "LVMM: A lightweight virtual machine memory management architecture for virtual computing environment," in Proc. 25th IEEE Intl. Performance Computing and Comm. Conf. (IPCCC '06), 2016.

[10] Tudor-Ioan Salomie, Gustavo Alonso, Timothy Roscoe, "Game-Theoretic Approach for Load Balancing in Computational Grids ",IEEE transactions on parallel and distributed systems, Vol. 19, No. 2, February y 2018.