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NEXT GENERATION CLOUD COMPUTING TECHNOLOGY

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ABSTRACT:

Cloud computing, one of the emergent topic in the meadowof information technology, is the expansion of distributed computing, parallelcomputing and grid computing. By usingthe internet and central remote services it preserves the applications data etc. which offers much more competent computing bycentralizing memory, storage, bandwidth and processing, and so on.There areseveral layers in present cloud computing architecture, platforms, servicemodels, issues i.e. security, reliability, privacy, openstandard etc. and types. These tendencies have motivated in the need for a change of new computing architectures that will be offered by futurecloud infrastructure.It can also be considered all computation resources and manage automatically through the software without interpose. These architectures are estimated to influence areas, such as connecting people and devices, data-intensive computing, self-learning systems and the service space.

KEYWORDS: Cloud Computing, Multi-cloud, cloud security, data management, and application development.

I. INTRODUCTION

Cloud Computing is the latest evolutions of computing models after parallel processing, distributed computing and Grid computing. Cloud computing accomplish multi-level virtualization and perception through active integration of Variety of storage, computing, applications, data and other resources, users can be easy to use powerful computing and storage capacity of cloud computing must to connect to the network. There is no suspicion that cloud computing is the most widespread topic in IT industry in 2009, Amazon, Google, Yahoo and further Internet service providers Microsoft, IBM and other IT vendors have put onward their own cloud computing strategy, the very littlebudget of cloud computing platform becomes the attention of the industry. In the interim, Oracle CEO L. Ellison considers that cloud computing is not anything more than “everything that we currently do”. The cloud computing will deliverthe virtualization, dynamic resource pool, the high usability etc. for succeeding generation. Servicesand resources offered on the cloud have promptlyimproved in the former decade. These deviations were strengthened by industry and academia led energies towards realizing computing as anefficacy. This vision has been accomplished, but there are continuing modifications in the cloud computing landscape which this paper targets to the existing. This is in divergenceto how resources from a single cloud provider or data center were used conventionally. Subsequently, new computing architectures are evolving. In this paper, we study `what future cloud computing looks like' by projecting out trends and directions for tracking meaningful research in emerging next generation computing systems.

II. WHAT IS CLOUD COMPUTING

Cloud computing is the on-demand accessibility of computer system resources, especially computing power and data storage without direct active management by the user. The term is generally used to define data centers accessible to many users over the Internet. Large clouds, major need today, often have tasksdispersed over multiple locations from central servers. If the association to

the user is relatively close, it may be designated an edge server.

The availability of low-cost computers, high-capacity networks and storage devices as well as the extensive adoption of hardware virtualization and autonomic and efficacy computing has led to growth in cloud computing. In 2019, Linux was the most extensively used operating system, containing in Microsoft's offerings and is thus described as foremost. The Cloud Service Provider will display, keep up and crease data about the intrusion identification, firewalls or/and counteractive action frameworks and information stream exclusive the network.

Cloud computing grips the group of resources automatically and with dynamism through software and hardware. Cloud computing is the facility of data storage or processing, consuming multiple servers as if one computer gain access to over the internet. A person can contact a word processing application, opened within an internet browser, write the document and lead it back to the cloud for storing and it is ready to be retrieved for later. Cloud computing offers secure access all our data and applications from whichever network device.

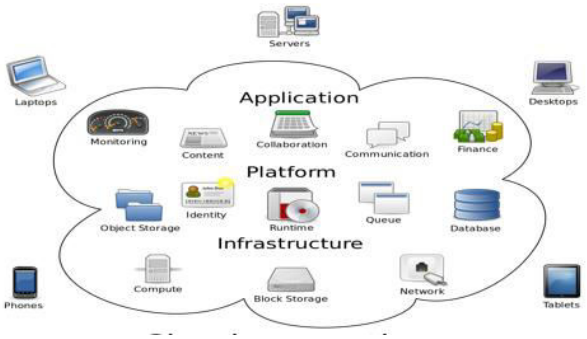

Figure 1: Cloud Computing

III. WHY CLOUD COMPUTING

There are a lot of profits of cloudcomputing above traditional computing. The major cloudproviders such as Microsoft, Google and Amazon have manufacturedand are functioning on building the world's biggest data centersacross the United States and away. Every data centercomprises hundreds of thousands of cooling equipment, computer servers and substation power transformers. Thecloud computing skill is environment pleasant as byswitching the hardware with cloud computing systems easesenergy costs as well as decreases CO2 radiations, it has businessprofits because businesses can directly obtain the welfares ofthe huge infrastructure without having to appliance andadminister it directly, it can decrease implementation andmaintenance costs having small initial cost, it has comfort of backupsystem with associated to backing up all thick client PCs, it hasflexibility of information which easily used globally, it deliversIT resources instantaneously and supports scalability givingtheneeds of user or customer which is particularly useful duringtopmost times of the year when there is a need for furtherresources that are not required in other parts of the year. Cloud computing will enhance new markets which are nowpresent in other business fields. This includes cloud traderswhich will be able to retail and purchase resources like traders donowadays on stock markets. Cloud computingdelivers the most trustworthy and secure data storage center. Consumersdo not have to fear about virus attack, data loss and otherproblems. The "cloud" achieves information by a professionalteam. Moreover, strict rights managing strategy can help us toshare data. It involves minimum for users' terminal device. Andit is stress-free and appropriate to use. It is not essential to downloadsoftware and data or to upgrading dynamically in the "cloud"side. We can contact cloud services anytime and anyplace onlywith a computer linking to the Internet. Cloud computinghas excellent computing power. Thousands of computers form agreat server in cloud services which provided users withinfluential computing and data processing ability that is hardto recognize for a personal computer. It can ease infrastructuremanagement bond. The profits of arrangingapplications using cloud computing include

decreasing run timeand response time, reducing the threat of deployinglowering the cost of entry, physical infrastructure andgrowing the speed of improvement.

IV. POTENTIAL ISSUES OF CLOUD COMPUTING

In the previous years, cloud computing has grown from being a capable business concept to one of the fastest emerging segments of the IT industry. But as progressively information on individuals and companies is engaged in the cloud, doubts are beginning to grow about just how innocent an environment it is.

1) Security:Where is our data safer, on our local hard driver or else on high security servers in the cloud? Some debate that consumer data is safer when managed within, while others debate that cloud providers have a tough incentive to uphold trust and as such employ anadvanced level of safety. On the other hand, in the cloud, our data will be dispersed over these individual computers irrespective of where our base repository of data is eventually stored. Diligent hackers can attack virtually any server and there are the figures that show that one-third of gaps result from whipped or misplaced laptops and other devices and from employees' by coincidencerevealing data on the Internet, with nearly 16 percent due to insider theft.

2) Privacy:Dissimilar from the traditional computing model, cloud computing operates the virtual computing technology, users' personal data may be dispersed in various virtual data center rather than halt in the same physical location, even though the national borders, at this time, data privacy defense will face the dispute of diverse legal systems. Attackers can examine the critical task be determined by on the computing task give in to by the users.

3) Reliability:Servers in the cloud have the similardifficulties as our own local servers. The cloud servers also involveinterruptions and go-slows, what the dissimilarity is that users have anadvancedreliant on Cloud Service Provider (CSP) in the model of cloud computing. There is a largemodification in the CSP's service model, once we hand-picked a particular CSP, we may be locked-in, thus bring a potential business safe risk.

4) Open Standard:Open standards are serious to the progress of cloud computing. Most cloud providers uncover APIs which are typically well-documented but also distinctive to their execution and thus not interoperable. Some retailers have assumed others' APIs and there are a number of open standards under progress, comprising the Open Cloud Computing Interface (OCCI), Open Grid Forum's (OGF's). The Open Cloud Consortium (OCC) is operational to progress consensus on early cloud computing standards and practices.

5) Freedom:Cloud computing does not permit users to physically retain the storage of the data, parting the data storage and control in the influences of cloud providers. Consumers will struggle that this is pretty important and gives them the ability to preserve their own prints of data in a form that keeps their freedom of choice and defends them against certain issues out of their control at the same time asunderstanding the incredible benefits cloud computing can bring.

V. EMERGING COMPUTING ARCHITECTURES

The cloud computing infrastructure is mounting and needs new computing models to satisfy large-scale applications. Computing models, namely server less computing, volunteer computing, and fog andmobile edge computingare studied that will set trends in futureclouds.

Server less Computing

Conventional computing on the cloud needs an application to be hosted on a Virtual Machine (VM)

that in turn compromises a service to the user. If a web server is compered on a cloud VM, for example then the service owner restitutions for the entire time the server application is compered (regardless of whether the service was used). The metrics beside which the routine of an application is usually benchmarked compriselatency, scalabilityand elasticity. Therefore, upgrading efforts on the cloud prominence on these metrics. In contrast, with distributed data center organization that may have comparatively less processing power, it will not be best to repeatedly host servers that will remain idle for a long period of time. In its place an application in a fog or MEC environment may be modularized with high opinion to the time taken to perform a module or the memory used by the application. This will indulge a different cost model that accounts for the memory encouraged by the application code for the period it was implemented and the number of requests achieved. As the name signifies `server less' does not mean that computing will be simplifieddestitute of servers.

In this outline, it simply means that a server is not leased as a conventional cloud server and designers do not think of the server and the engagement of applications on a cloud VM23. From a developers perspectivetests such as the placement of an application on a VM, over/under provisioning of resources for the scalability, fault tolerance and application do not need to be fragmented with. The infrastructure, encompassing the server is preoccupied away from the user and as an alternative properties, such as cost, control and exibility are reflected. The experiments that will deferral the widespread acceptance of server less computing will be the major shift in the properties of an application that a programmer will need to emphasis on; scalability, not latency, and elasticity. Another trial is growing programming models that will allow for high-level concepts to comfortserver less computing.

Volunteer Computing

Ad hoc clouds and cloudlets are developing to lodge more innovative user-driven and mobileapplications that can profit from computing closer to user devices. The availability of compute resources isnot certain in an ad hoc cloud or cloudlet as in a conventional data center and consequently a pay-as-you-goor an upfront payment for reserving compute, storage or network resources will not be appropriate. As a substitute, acrowd funded approach in which standby resources from user computers or devices are offered for creatingan ad hoc cloud. Such a computing model may be used to support applications that have a societal orscientific focus.Volunteer cloud computingcan take diverse forms. For example, users of a social networkmay share their assorted computing resources in the form of an ad hoc cloud. This is referred to as`social cloud computing'. More consistent owners are pleased through a reputation marker within thesocial network. The Cloud@Home project rewards volunteers by payment for their resource donations.Gamification is also reported as an encouragement. Similar research is also recounted in the name of `peer-to-peer cloud computing'.The trials that need to be overcome to fully advantage from volunteer cloud computing will be Firstly inminimising the outflows for setting up a highly virtualised environment given that the core hardwarewill be heterogeneous and ad hoc. Furthermore, there are security and privacy concerns

that will need to beaddressed to increase confidence in the public to more readily become volunteers for scheduling ad hoc clouds.

Fog and Mobile Edge Computing

The premise of fog computing is to influence the existing compute resources on edge nodes, such as mobilebase stations, routers and switches, or assimilate additional computing capability to such (network) nodesalong the entire data path concerning user devices and a cloud data center. The general characteristic of thesenodes are that they are resource constrained. This will become likely if general purpose computing can besimplified on existing edge nodes or surplus infrastructure, such as micro clouds or cloudlets are organized.Preliminary research hearsays the applicability of fog computing for use-cases, such as in online games andface recognition one characteristic of using fog computing is that applications can be perpendicularly scaled across different computinglayers. This willassist only essential data traffic beyond the data source. The term `Mobile Edge Computing (MEC)' is used in literature, which is related to fog computingin that the edge of the network is employed. However, it is restricted to the mobile cellular network and doesnot join computing beside the entire path taken by data in the network. In this computing model the radioaccess network may be united with the aim to reduce network congestion. Intel has reported the real life use of MEC19 and industry led proof-of-concept models thatsupport MEC have been developed20. It is expected that MEC will be adopted in 4G/5G networks21.To realise fog computing and MEC at least two challenges will need to be addressed. Primarily, complexmanagement issues related to multi-party service level agreements, expression of responsibilitiesand obtaining a unified platform for management given that dissimilar parties may own edge nodes. Secondly,improving security and addressing privacy problems when multiple nodes relate between a user device and acloud data center.

VI. RESEARCH DIRECTIONS

Current research is mostly directed at developing libraries, platforms and languages for individual requirements of the developing computing architectures. For example, distinct software platforms are accessible for server less computing or IoT. Though, there are a number of common desires for these emerging architectures and are not a design factor when developing platforms. Efforts towards emerging a unified environment that can address the collectivesupplies of emerging architectures to attain interoperable and application liberated environments will need to be a track for research. Such united environments can then be stretched to suit individual requirements. Given that there are several levels of communication in evolving cloud architectures, there are possibly two customers. The first is an application owner successively the service on the cloud who wants to increase the QoS for the application user. The second is the application user who could create use of a distributed architecture to improve the QoE when using a cloud service. Current Cloud systems mainlyemphasis on consolidation of VMs to reduce energy consumption of servers. Though, cooling systems and networks takes a major proportion of the total energy consumed. Developing techniques will need to be established that achieve energy networks, efficiency of servers and cooling systems. These techniques can influence the interplay between IoT-enabled cooling systems and data center managers that dynamically markconclusions on which

resources to switch on/off in both time and space dimensions created on workload predictions.

VII. CONCLUSION

This paper shows all about of cloud computing which is aninnovative emerging technology in present world. Although there are numerous issues and challenges in cloud computing technology, a huge scope for research and we can say that it is a development trend in near future. It is expected that this technology conveys for us an infinite fast microprocessor, capability of computing, huge memory, reliable system architecture, high-speed network etc. by resolving the current issues and challenges and we will move in a new era of next generation computing through cloud computing technology. Both the varying cloud infrastructure and emerging computing architecture will influence a number of areas. They will play a vibrant role in educating connectivity between people and devices to enable the Internet-of-Things model. The area of data intensive computing will find novel techniques to address experiments related to allocating with volume of data. New services, such as acceleration, containers and function, is awaited and become popular. A number of research areas will find merging with next generation cloud systems to transport self-learning systems. These changes are being managed both by the industry and academia, but there are a number of encounters that will need to be speak to in the future.

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