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INFORMATION TECHNOLOGY FOR ENTERPRISE CLOUD COMPUTING

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Abstract: Cloud computing promises to increase the velocity with which applications are deployed, increase innovation, and lower costs, all while increasing business agility. An inclusive view of cloud computing that allows it to support every facet, including the server, storage, network, and virtualization technology that drive cloud computing environments to the software that runs in virtual appliances that can be used to assemble applications in minimal time. This paper discusses how cloud computing transforms the way of design, build, and deliver applications, and the architectural considerations that enterprises must make when adopting and using cloud computing technology.

Keywords – Cloud computing, virtualization technology

ABSTRACT

Cloud computing promises to increase the velocity with which applications are deployed, increase innovation, and lower costs, all while increasing business agility. An inclusive view of cloud computing that allows it to support every facet, including the server, storage, network, and virtualization technology that drive cloud computing environments to the software that runs in virtual appliances that can be used to assemble applications in minimal time. This paper discusses how cloud computing transforms the way of design, build, and deliver applications, and the architectural considerations that enterprises must make when adopting and using cloud computing technology.

1. INTRODUCTION

Cloud Computing Basics:

Cloud computing is Internet ("cloud") based development and use of computer technology ("computing"). It is an emerging computing technology that uses the Internet and central remote servers to maintain data and applications. Cloud computing allows consumers and business 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 storage, memory, processing and bandwidth. Cloud computing is the convergence and evolution of several concepts from virtualization, distributed application design, grid, and enterprise IT management to enable a more flexible approach for deploying and scaling applications. Cloud promises real costs savings and agility to customers. Through cloud computing, a company can rapidly deploy applications where the underlying technology components can expand and contract with the natural ebb and flow of the business life cycle. Traditionally, once an application was deployed it was bound to a particular infrastructure, until

the infrastructure was upgraded. The result was low efficiency, utilization, and flexibility. Cloud enablers, such as virtualization and grid computing, allow applications to be dynamically deployed onto the most suitable infrastructure at run time. This elastic aspect of cloud computing allows applications to scale and grow without needing traditional 'fork-lift' upgrades. IT departments and infrastructure providers are under increasing pressure to provide computing infrastructure at the lowest possible cost. In order to do this, the concepts of resource pooling, virtualization, dynamic provisioning, utility and commodity computing must be leveraged to create a public or private cloud that meets these needs. World-class data centers are now being formed that can provide this Infrastructure-as-a-Service (IaaS) in a very efficient manner. Customers can thus decide to develop their own applications, to run on their own internal private clouds, or leverage software as a SaaS application that run on public clouds. Integration and federation of services across both the public and private cloud, so-called "hybrid clouds," is an emerging area of interest. The public cloud concept allows customers to develop and deploy applications with tremendous speed without the procurement and red-tape issues of dealing with potentially slow moving and costly IT departments. This also allows customers to shift traditional Capital Expenditures (CapEx) into their Operating Expenditure (OpEx) budgets. Driven by concerns over security, regulatory compliance, control over Quality of Service (QoS), vendor lock-in, and long-term costs, many larger customers, who have the economies of scale and strong IT competency, will build internal private clouds. These private clouds can provide the same cost and agility benefits as public clouds, while mitigating enterprise concerns about security, compliance, QoS, lock-in and TCO. A fully decentralized approach for managing the workload of large, enterprise cloud data centers in an energy-efficient is presented [1]. The pay-per-use business model is one of the key factors for the success of the cloud computing paradigm. The resources are acquired only when needed and charged on the basis of their actual usage. The execution of applications in the cloud implies costs that depend on the usage of the leased resources and on the resource pricing model adopted by the providers. Massimiliano Rak [2] discussed a approach to evaluate the tradeoff between costs and performance of cloud applications through the use of benchmarks and simulation. Various studies investigated the benefit of using Cloud computing technologies by analyzing the performances of HPC scientific applications [3-5] or the cost of performing scientific experiments [6] on the Amazon Cloud infrastructure.

2. SEGMENTS OF CLOUD COMPUTING

Cloud computing is broken down into three segments: "applications," "platforms," and "infrastructure".

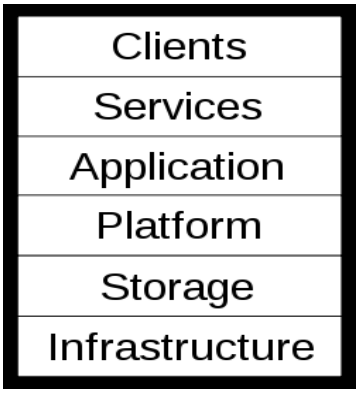

Fig. 2. Segments of Cloud Computing.

I. Application

So far, the applications segment of cloud computing are the only segment that has proven successful as a business model. By running business applications over the Internet from centralized servers rather than from on-site servers, companies can cut some serious costs. Furthermore, while avoiding maintenance costs, licensing costs and the costs of the hardware required to run servers on-site, companies are able to run applications much more efficiently from a computing standpoint.

II. Platforms

Platforms serve as an interface for users to access applications provided by partners or in some cases the customers.

The following companies are some that have developed platforms that allow end users to access applications from centralized servers using the Internet. Next is the name of the platform used by the company:

1. Google (GOOG) - Apps Engine
2. Amazon.com (AMZN) - EC2
3. Microsoft (MSFT) - Windows Live
4. Terremark Worldwide (TMRK) - The Enterprise Cloud

III. Infrastructure

The final segment in cloud computing, known as infrastructure, is the backbone of the entire concept. Infrastructure vendors provide the physical storage space and processing capabilities that allow all the services described above.

3. IMPLEMENTATION OF CLOUD COMPUTING

All of the architectural and organizational considerations mentioned herein are generally apply to all implementations of a cloud infrastructure. As we focus on building the cloud, a number of models have been developed for deploying a cloud infrastructure.

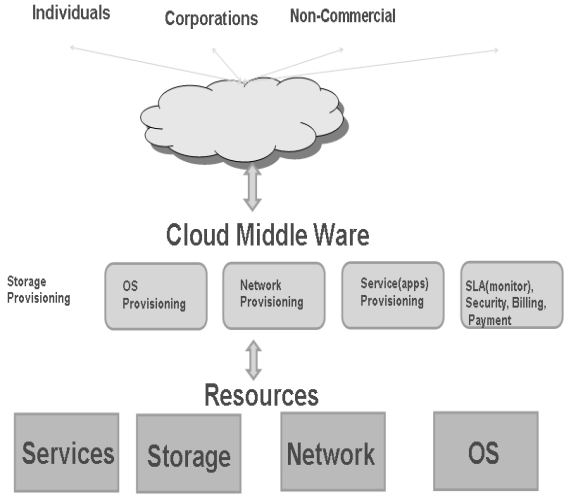

Fig. 3. Implementation of Cloud Computing.

Private Clouds

In a private cloud, the infrastructure for implementing the cloud is controlled completely by the enterprise. Typically, private clouds are implemented in the data center of the enterprise

and managed by internal resources. A private cloud maintains all corporate data in resources under the control of the legal and contractual umbrella of the organization. This eliminates the regulatory, legal and security concerns associated with information being processed on third party computing resources. The private cloud can also be used by existing IT departments to dramatically reduce their costs and as an opportunity to shift from a cost center to a value center in the eyes of the business.

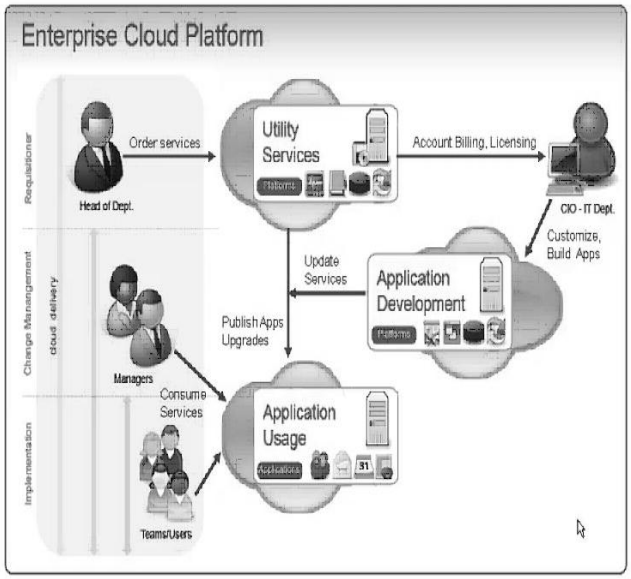

Fig. 4 Implementation of Cloud Computing in Enterprises.

CLOUD COMPUTING SECURITY PLAN

Cloud computing has unique security risks. Security risks, threats, and breaches can come in so many forms and from so many places that many companies take a comprehensive approach to security management across IT and the business. The following pointers useful for creating cloud computing security plan.

- In most circumstances, approach cloud security from a risk-management perspective. Be sure to involve your organization's risk-management specialists in the planning.
- The cost of security could be an issue. Be aware of what similar organizations spend on IT security and be prepared to spend a similar amount. It also helps to track time lost due to any kind of attack—as a measurement of cost that you may be able to reduce.
- Identity management is key. Give priority to improving identity management if your current capability is poor.
- Try to create general awareness of security risks by educating and warning staff members about specific dangers. It is easy to become complacent, especially if you're using a cloud service provider. However, most security breaches are created inside the network.
- Use external IT security consultants to regularly check your company's security policy and network, as well as those of your cloud service providers.

- Determine specific IT security policies for change management and patch management, and make sure that policies are well understood by your staff and your cloud service provider.
- Stay abreast of news about IT security breaches in other companies and the causes of those breaches.
- Review backup and disaster-recovery systems in light of IT security. Apart from anything else, IT security breaches can require complete application recovery.

Because of the complexity of securing cloud environments, many organizations use hybrid cloud environments that include public as well as private clouds.

For IT departments in larger enterprises, developing a private cloud often makes the most financial and business sense. When developing the architectural vision, an enterprise architect should bear in mind the characteristics of cloud computing as well as consider some of the organizational and cultural issues that might become obstacles to the adoption of the future state architecture. When moving ahead, decisions must be made on whether the future-state technical architecture should emphasize compatibility with the current standard or start from scratch to minimize cost. Future state systems architecture designs involve trade-offs between lower cost/operational efficiency and greater flexibility. Using an Enterprise Architecture framework can help enterprise architects navigate the trade-offs and design a system that accomplishes the business goal.

CONCLUSION

Cloud computing offers real alternatives to IT departments for improved flexibility and lower cost. Markets are developing for the delivery of software applications, platforms, and infrastructure as a service to IT departments over the "cloud". Cloud Computing services are readily accessible on a pay-per-use basis and offer great alternatives to businesses that need the flexibility to rent infrastructure on a temporary basis or to reduce capital costs.

Architects in larger enterprises find that it may still be more cost effective to provide the desired services in-house in the form of "private clouds" to minimize cost and maximize compatibility with internal standards and regulations. If so, there are several options for future-state systems and technical architectures that architects should consider finding the right trade-off between cost and flexibility.

References

1. Michael Pantazoglou, Gavriil Tzortzakis, and Alex Delis, Decentralized and Energy-Efficient Workload Management in Enterprise Clouds, IEEE transactions on cloud computing, Vol. 4, No. 2, 2016
2. Antonio Cuomo, Umberto Villano and Giuseppe Aversano, Prediction of cost and performance of cloud applications, International Journal of Cloud Computing, Vol.4, No.1, pp.28 – 46, 2015.
3. Christian Vecchiola, Suraj Pandey, and Rajkumar Buyya, High-Performance Cloud Computing: A View of Scientific Applications, 2009.
4. E. Deelman, G. Singh, M. Livny, B. Berriman, and J. Good, "The cost of doing science on the cloud: the montage example," Proc. Of the 2008 ACM/IEEE conference on Supercomputing (SC'08). Piscataway, NJ, USA: IEEE Press, pp. 1–12., 2008.

5. R. Buyya, C. S. Yeo, S. Venugopal, J. Broberg, and I. Brandic. "Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility," Future Generation Computer Systems, vol. 25, no. 6, June 2009, pp 599–616, Elsevier Science, Amsterdam, The Netherlands.
6. C. Evangelinos, C. N. Hill, "Cloud Computing for Parallel Scientific HPC Applications: Feasibility of Running Coupled Atmosphere-Ocean Climate Models on Amazon's EC2," Cloud Computing and Its Applications 2008 (CCA-08), Chicago, IL. October 2008.

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Dr. M. Thangamani possesses nearly 23 years of experience in research, teaching, consulting and practical application development to solve real-world business problems using analytics. Her research expertise covers data mining, machine learning, cloud computing, big data, fuzzy, soft computing, ontology development, web services and open source software. She has published nearly 100 articles in refereed and indexed journals, 15 articles in SCI with high impact factor journals, books and book chapters and presented over 85 papers in national and international conferences in above field. She has delivered more than 79 Guest Lectures in reputed engineering colleges and reputed industries on various topics. She has got best paper awards from various education related social activities in India and Abroad. She is on the editorial board and reviewing committee of leading research journals, which includes her nomination as the Editor in chief to International Scientific Global journal for Engineering, Science and Applied Research (ISGJESAR) & International Research Journal in Global Engineering and Sciences (IRJGES) and on the program committee of top international data mining and soft computing conferences in various countries. **Further information can be visit** in www.drthangamani.com.