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Cloud Computing Implementation and Security- Case Study Approach

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Abstract: ***The cloud computing is the most useful area now a days. It works at many different domains with virtualization concept and used in education, industry domain too in large extent. In education different universities and educational institutes are taking benefit of cloud infrastructure especially for exam sections, use of web applications, remote applications etc. At same time industry uses it for fast communications with customers and responses, proper working of ERP systems and financial conditions. This paper elaborates all these conditions with the case study.***

Keywords: ***Cloud computing, Cloud infrastructure, Education domain, Industry domain, Remote applications, Virtualization.***

I. INTRODUCTION

Cloud computing has increasingly been discussed and developed in recent years. This is a relatively new trend of IT industry development, focused on users, and driven by the increasing use of various mobile devices such as laptops, tablet PCs and smart phones**.** The use of digital devices mentioned above are has increased tremendously and use of remote network also has increased and give lead to the wide use of cloud computing. This realistic is given by the definition of The National Institute for Science and Technology (NIST) as, Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

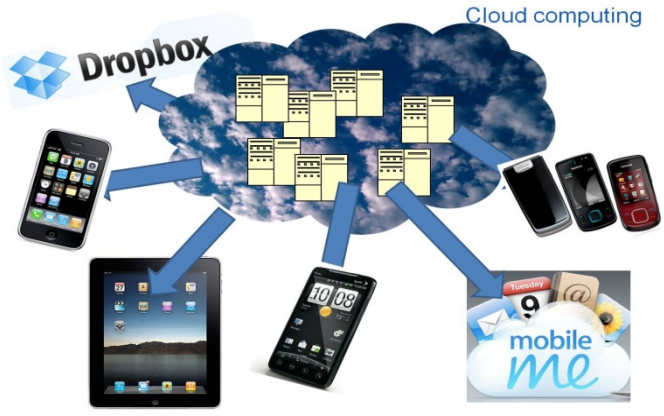

Fig 1 Use of cloud computing with various mobile devices

Many types of cloud computing services are available because of massive presence of the internet. Communication as a Service (CaaS) allows for certain messaging tools such as Voice over IP (VoIP), Instant Messaging (IM), and video conferencing. Infrastructure as a Service (IaaS) is the delivery of computer infrastructure as a service which allows the customer to maintain owner and management of their applications while off-loading infrastructure management to the IaaS service providers. Monitoring as a service (MaaS) is the outsourcing of security services to a third party security system as per the requirement.

Platform as a service is an application delivery model that is independent from the specific operation systems. This is specifically for web based development infrastructure. Software as a service (SaaS) is the service when software vendor supplies software over a network instead of regular installation process on the individual computer. All these different services enhance its use in diversified areas and same is explained here with education and industry area.

II. Review of Literature

The literature on cloud computing has many different definitions and viewpoints. In its 2008 and 2009 hype cycles, Gartner characterizes cloud computing as a technology that is moving up toward the peak of inflated expectations. That said, Gartner predicts that by 2011, early technology adopters will forgo capital expenditures and instead purchase 40% of their IT infrastructures as a service. The analyst literature generally agrees with the Gartner assessment that cloud computing will achieve mainstream adoption within 2 to 5 years. Cloud computing offers different services and applications which are different from traditional enterprise IT environments. By providing a way to exploit virtualization and aggregate computing resources, cloud computing can offer economies of scale. It can also offer services to immediately exploit installed hardware and software, rather than using time and resources to design, deploy and test a new implementation. Cloud computing has elevated IT to newer limits by offering the market environment data storage and capacity with flexible scalable computing processing power to match elastic demand and supply, whilst reducing capital expenditure. The successful implementation of cloud computing is managing security effectively as soon as it begin to run the application. Thus different services and security conditions offered by cloud computing help to use it in education field and in industry for more good, fast and secure performance.

III. Use of Cloud in Education

The Cloud delivers computing and storage resources to its users. It works as a service on the demand policy. Cloud computing is a business model worked with new technologies like virtualization, SaaS and Broadband Internet with all recent fast internet facilities. With applications in the cloud (SaaS), students and teachers can flexibly access their data via a web browser from a computer at home, school, library, student room or some other place and achieve rapid and efficient communication. Many applications such as Google Apps for Education or Microsoft Live@edu with Office 365 and other applications for Education are also available and that combine tools for communication and collaboration. Many technologies that were previously expensive or unavailable are now becoming free to anyone with web browser. This is applicable to all websites, blogs, online sharing, article editing, publishing and different platform working in the “cloud”. Students are already using many of these technologies in their personal lives. In today’s educational environment each institution has to handle enormous amount of data for storage, retrieval, and management. Scientific computing research involves analysis of large data sets. Organizations have to provide access to information from a variety of devices that include mobiles, tablets, laptops and desktops. Institutions must purchase and manage software licenses for various products and also institutes require to adhere to governing data management and retention policies.

Many educational organizations have implemented the cloud infrastructure and getting efficient benefits from this. Follwing case studies are exploring the same.

A. Case Study-1

University of Pune (UoP) in an innovative step, has introduced cloud computing in exam systems in four faculties — Masters in Business Management, Management studies, Engineering and B.Ed.The cloud computing system has been approved in the board of examination meeting . The system has tested in some colleges, where the examination papers has stored in the university's cloud, passwords has provided to the colleges and asked them to download it. After a successful trial , this technology has implemented in various exam centers for university exams. The colleges can download the examination paper and then xerox it for further distribution to the students.This technique is very helpful to avoid leakage of papers and information.

B. Case Study-2

Bharati Vidyapeeth (BVP) is a prime educational institution has adopted cloud-based solution which ensures data security and communication in real time, practically anywhere, anytime for email, calendar, and contacts in one place, accessed via Outlook Web Apps.Use of Cloud based infrastructure helps the educational institution to build a community, brings collaboration and reduces costs.

C. Case study-3

Students at Telfair County Schools located in rural Georgia were lacking innovation in technology compared to the capabilities of peer districts. The management was in search of a reliable remote application server that was simple, straightforward and which fit into their tight budget. While Citrix provides an array of features, it requires additional hardware and licensing cost that was not a feasible option; this made them move to 2X remote solutions. 2X Application Server was purchased and installed on 12 terminal servers to deliver virtual desktops to thin clients. The virtualization platform-independent design allowed Telfair to add many users to the network without additional costs and virtualization platform integration hassles. Moreover, simplicity in integrating the application into the existing system and managing it in addition to scalable solutions improved the ROI on the product. Instead of making a huge investment in additional hardware and licenses, Telfair management is now able to provide access to applications at home to continue reading the study material after school.

IV. USE OF CLOUD IN INDUSTRY

In the professional world, the trend of discovering and using technologies in our personal life is called "consumerization". This means we should demand and consume the required services.Percentages for cloud usage in different Industrial Sectors and Services is as follows,

Media / Military and National Security- 3,Manufacturing- 10,Business and management services-10,Chemical and pharmaceutical-3,Freight services / Energy management / Membership organizations-2,Other-4,Commercial physical research-1,Food / Retail /Healthcare-4,Financial services-12Government-7 etc.

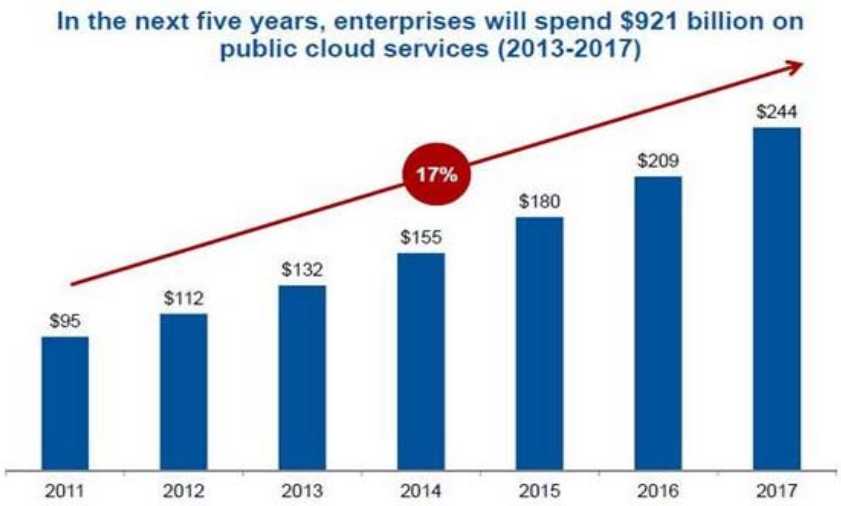

Fig 2 Public cloud services forecast
Source:- Gartner Public cloud services forecast , September 2013

As cloud computing hype continues to grow, it is important to know, how companies have used cloud computing to drive business value, as well as the lessons learned and best practices developed along the way.

A. Case study-1

Razorfish is a full-service digital agency at the intersection of creativity, media and technology. This requires to improve ability to respond quickly to customer demands for web campaigns and requires to support high volume short run campaigns more cost effectively.The cloud infrastructure has provided the solution as; the agency used Rackspace as a cloud infrastructure platform. This builds Blogs, Microsites, and campaign-related pages for large companies, such as Southwest Airlines, H&R Block.The result is,the new infrasture helps to improve set up and reduced from 4-6 weeks to 24 hours,on average at 25% of previous cost. This adoption has given key lesson to the industry as,if you are moving web-centric applications with solid security and management practices, you can move them with little deviation to cloud infrastructure.

B. Case Study-2

D-Link Makes Aggressive Move to the Cloud: By moving the vast majority of its non-ERP application portfolio to the cloud, it has improved enterprise agility and risk management, decreased IT costs and shifted its focus to the business. D-Link sees a $2 million cost savings, but the biggest business benefit has been in the IT organization's ability to respond to evolving business requirements. This benefit in the form of agility and support for rapid business innovation was consistently cited by the majority of the companies.

C. Case Study-3

The KPMG serves leading information technology companies and has a strong presence in the financial services sector in India while serving a number of market leaders in other industry segments. It has a client base of over 2700 companies in India. The firm's global approach to service delivery helps provide value-added services to clients. By adopting Cloud based services KPMG has served benefits with respect to the clients as,

- Results using cloud as a supplier network
- Reduced latency between and among suppliers
- Reduced lead times on information exchange from 30 days to 1 day

As demand changes at the store, all parties see and act upon the changes which resulted in more product getting to the right place at the right time with less inventory through the supply chain.

V. Future Scope

Statistics show that cloud computing adoption rates in education and industry are on the rise. Still security issues are not totally cured .So, for future scope authentication and identity management where by using cloud services, user can easily access their personal information and make it available to various services across the Internet, Trust management and policy integration, Organizational security management etc are some issues can be considered and if get solved efficiently, the it will add new characteristics in trust of cloud computing implementation.

VI. Conclusion

Cloud computing as an exciting development is a significant alternative today's educational and industry perspective. The education industry is constantly under pressure to teach students skills that will be applicable when they finish receiving their education. Cloud computing has been an increasing popular trend in almost all industries in the last 5-10 years. Cloud service use has significant potential for cost savings when used for the right workloads. Examining the real-world experiences of companies using cloud computing will enable those contemplating its use to learn from the success, missteps and best practices of those that have gone before.

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Mrs. Aparna Sachin Nisal, received the MCA degree for Computer Management. She is also a diploma holder for Software Testing and worked as a Software Test Engineer in the IT organization. She is now working as an Asst. professor for P.D.V.V.P.Foundations's Institute of Business Managemnt & Rural Development, Ahmednagar.

