CLOUD COMPUTING – "A NEW ERA FOR IT PROFESSIONALS"

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Abstract

Cloud computing predicts innovative professional opportunities for Information Technology professionals. In various cases, existing basic skillfulness sets transfer straightforwardly to cloud technologies. In additional instances, IT pros are required to extend innovative proficiency sets that meets the requirements of emerging cloud job demand. Organizations consider deploying to cloud computing will need them to train their Information Technology professionals about the prospective opportunities at the forefront so that they can fabricate their staff ideas, capabilities and skills ahead of the transformation. Information officers who think to produce extra business significance from Information Technology inevitably have to be at the frontage on stroke of cloud skills education for their own organization as well as the need to build training competence for their IT staff and professionals. The promising cloud world offers those with the competence to build and cultivate their portfolio of skills acquired by training. This paper explores the overview of the cloud and outlines the skill sets and the IT pros and cons of Information Technology professionals. It explains what the cloud computing offers and how it applies to the services and impacts existing infrastructure.
Keywords: Cloud, Cloud Computing, Information Technology, IT Professionals

I. Introduction to Cloud Computing

If we break cloud computing into pieces and try to make a simple explanation from the scratch, it would be as follows: Cloud computing is remotely located shared resource or simply a cloud where you can store your personal or official documents, software, pictures, music etc [1]. It is a framework for delivering IT services where resources are extracted from the internet using tools and applications on web, rather than a point to point connection to a server [1]. The server stores the data software packages. The cloud structure enables access to information as long as an e-device has access to the web applications. It reduces the infrastructural costing for any organization, in view of the fact that they are not expected to own their own servers and can use capacity leased from third parties [1]. It can also be dynamically reallocated on demand. This explanation covers only a small fragment of this concept, while on the contrary, cloud computing is a vast, open field to study, explore and innovate novel applications [1].

II. Components of Cloud Computing

A cloud computing system consists of three main components:-clients, data centre, and distributed servers.

a. Clients

Clients in a cloud computing architecture are similar to the clients of daily local area network (LAN). These are the computers which reside on the desk of the end users. This is where frontend applications are installed. They can be laptops, tablets, smart phones, or PDAs. The physical specifications of the client system are in following three categories:

● Mobile - Includes smart phones, tablets or PDAs.
● Thin – These are the deposit terminals having no hard disk. It simply displays the information.
● Thick - These types of clients are regular computers, using a web browser similar to Firefox or Internet Explorer to connect to cloud.

b. Data Centre

Data centre is a collection of servers where the applications which the user subscribes are hosted. A data centre server could be virtualized in nature where the software is installed in the main physical server but appears as a separate server identity to the user. In this configuration, one can have many virtual servers running on one physical server.

c. Distributed Servers

If one server is down or not available instantly to a client request, it may be due to congestions etc., then the other servers activate to cater to the clients need. The data is regularly synchronized in the servers to provide services flawlessly.

III. Service Models

a. Platform as a Service (PaaS)
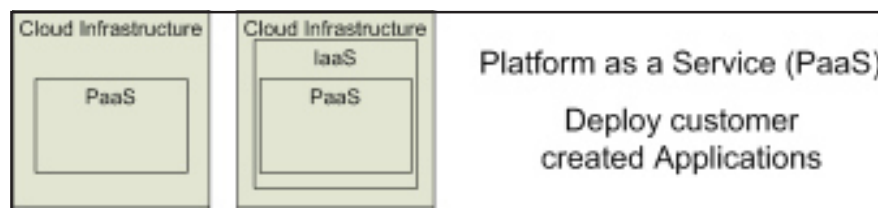
PaaS provides all of the services necessary to support the entire life cycle of building web applications and services completely from the Internet.

● Generally, applications should be developed with a particular platform in mind.
● Multi-tenant environment.
● Extremely scalable multi-tier architecture.

b. Infrastructure as a Service (IaaS)
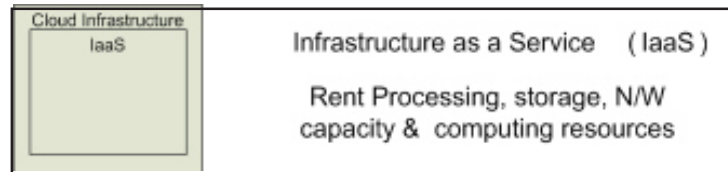
IaaS is the deliverance of technology infrastructure as a scalable service.
● Frequently billed based on usage.
● Usually multi-tenant virtualized surroundings.
● Can be bundled with managed services for OS and application support.
● Conventional managed hosting is a type of web hosting where a user chooses to lease entire server(s) housed in an off-site data center.
● Term based contract based on predictable source requirements

c. Software as a Service (SaaS)
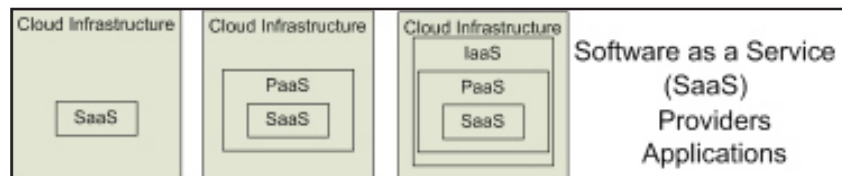
SaaS is a software deliverance method that provides licensed multi-tenant access to software and its functions remotely as a Web-based service.
● Typically billed based on usage.
● Usually multi-tenant environment.
● Greatly scalable architecture.

IV. Deployment Models

I. *Public cloud* (off-site and remote) describe cloud computing as where resources are dynamically provisioned on-demand, self-service foundation over the Internet, via web applications/web services, open API, from a third-party source who bills on a value computing basis.

II. A *private cloud* environment is frequently the first step for a firm prior to adopting a public cloud scheme. Corporations have discovered the advantages of consolidating shared services on virtualized hardware deployed from a main datacenter to serve local and remote users.

III. A *hybrid cloud* environment consists of some part of computing resources on-site (on premise) and off-site *(public)*. By means of incorporating public services, users can power cloud solutions for particular functions that are too costly to retain on premise, such as virtual server development domain, disaster recovery and backups.

IV. A *community cloud* is created when some organizations with similar requirements contribute to common infrastructure. Costs are stretch over fewer users than a *public cloud* but more than a single tenant.

V. Employment Reports and Scale

a. The employment scale for cloud computing jobs is 72, around 10,077 job positions were open in only the US, and in developing countries like China and India the number of vacant positions is much higher from 220,000 to 500,000 positions (Data collected from year 2012 - 2013) [2].

b. For a fresher programmer or for an IT professional, the salary scale goes from $90,650 to $110,800 according to the Wanted Analytics [2].

c. In 2012, a study conducted by IDC experts reveals that by 2015, nearly 14 million jobs related to IT cloud services would be flourishing worldwide. The BRIC and the US will be the centre of new positions capable of supporting public and private clouds solutions [2].

d. Microsoft reported that the demand for cloud-savvy IT professionals will grow by 26% annually until 2015 and will create more than seven million cloud-related vacancies worldwide [2].

e. In Europe, the Middle East and Africa, IDC estimates a growth of 24% per year to about 1.4 million cloud-related IT jobs by 2015. Asia Pacific region will have largest growth (32% per year) resulting in more than 2.3 million cloud-related jobs by the end of 2015 [2].

VI. Jobs in Cloud Computing Profession

The names might have changed but nothing new has been added to the job description of an IT professional, but there are a few changes. Following are the jobs in cloud computing profession:

- Systems Engineer
- Web Developer
- InformationTechnology Professional
- Platform Management Engineer
- Cloud Security Specialist
- Cloud Developer
- Software Engineer
- Performance Supervisor
- Security Management Engineer
- Risk Management Engineer
- Cloud Support Analyst
- Cloud Architect
- Management function as interior advocates for cloud computing, must be able to identify the business worth and opportunity of cloud computing and choose alternatives when appropriate. This noticeably expands on a tendency of monitoring the cost and business contribution of IT and ensuring alliance between financial and resource venture in cloud-related technologies and business outcomes.
- Project and program managers: Project management skills are necessary in all IT firms. Project management includes alignment of resources and coordinating activities to guarantee that specific activities, project milestones, and planned outcomes are accomplished.
- Business analysts: Business analysts have a clear knowledge of business objectives and cloud services.
- Application development and maintenance: Cloud computing and portable computing are a part of the similar trend towards readily available and remotely accessible data and maintenance of data.

VII. Characteristics and Skills Required for Cloud Computing Job Professional

It is well known that technical skills are the most important characteristics required for a programmer in this sector but there are more aspects than those that meet the eyes. The candidate should be well familiar with one or more than one of the following skills to acquire a placement in cloud computing field:

- Project management skills
- Mobile app development and management
- Security and compliance
- Business and financial skills
- Technical skills
- Architectural and business need assessment
- Data integration and analysis skills

A number of employers would want to have exposure or experience working with the technologies of one of the four big cloud computing companies: Amazon, Google, Microsoft or Salesforce.com, and/or experience working with virtualization technologies such as that of VMWare.

Other Requirements may include [3] :

- Knowledge of and experience with technologies such as Java, Web services, SOAP and Ajax; [3]
- Experiences of network and security architecture; [3]
- Experience with a cloud migration, data center migration, or server consolidation project;
- Communication, teamwork and problem-solving skills. [3]
- BA/BS degree in engineering, computer science or related field; [3]

Required activity of business analysts in IT - because user requirements must still be collected, cloud-based traders will be selected, and applications will be integrated into business processes [4].

VIII. Pros and Cons of Cloud Computing on Present and Future IT Professions

Pros:

- As explained above, the cloud computing will generate numerous new IT jobs in the fields of maintenance, infrastructure, security, database management, business analysis, project and IT management etc.
- Cloud reduction cost of software and hardware (all those downloaded applications, programs), and management of networking and overall IT costs.
- By using cloud based applications, we would always get better performance from our computer systems. Cloud computing system boots and runs quicker because they have fewer programs and processes loaded in the memory.
- The software price by using this computing is especially low because the consumer will not have to purchase any type of software, thus reducing the overall expenditure of the company.
- One of the most important benefits of cloud computing is scalability.
- Cloud computing also increases the reliability of data as the data is not physically stored on the computer of the user but at the server so any damage to the user machine does not cause any harm to the data.
- The data can be accessed from around the globe - this makes it flexible for the user to remotely access data.
- Cloud computing helps in assessing absolutely different levels of economic and financial feasibility as compared to previously available tools and methods.

Cons:

In many organisations where the systems that were previously developed or purchased and supported by IT staff will sooner or later be replaced by cloud based applications which do not require IT staffing. **Finance**

functions will be taken up by some IT software, like the one used by stock exchange executives.

In May 2010, Hewlett-Packard had to cut 9,000 jobs from their IT services department as they automated their data centre operations [10].

- Cloud computing exists on the basis that the Internet will always be robust and reliable in the coming time. While one can be fairly positive, there is always a danger of the unforeseen.
- Cloud computing assumes that the internet is robust throughout the globe as it is in Europe, North America and some parts of Asia. But customers from countries where Internet connectivity is inconsistent will be discouraged from depending on the cloud services.
- Cloud computing could require a large bandwidth for the clients, depending on what the client is hosting on cloud. As the bandwidth is supplied by the ISP they may charge the client if the bandwidth quota is exceeded.
- Cloud computing could expose the practices of the organisation or the client with the ISP. Their activities could be spied on and misused to benefit rival organisations.
- The third party data stored in cloud is threatened by a large number of factors like loss of control of data as it lies with the third party, risk of lock-in in cloud platform, reliability, unavailability at the time of requirement and many more.

IX.   Opportunities in Cloud Computing

Cloud computing provides an opportunity for business innovation by providing a stage to turn IT into a more efficient and approachable business service. In lot of organizations, cloud computing is in its infancy phase.

Numerous researchers conclude that cloud computing will cultivate, but it will be a path of obstacles. Worldwide studies say that 'cloud services 'spent $56.3 billion in 2009, a 21.3% increase from 2008 revenue which was $46.4 billion [9].

The market is predicted to increase to $150.1 billion [9]. These cloud services will quickly rise at over five times than the typical offerings. This rise will increase the job opportunities in different areas but especially in IT sector.

X.   Effects of Cloud Computing on Existing Jobs

Some months back, a study was released by Microsoft predicting that cloud computing would eventually add about 14 million jobs to the worldwide economy [5].

- Information technology is becoming a common responsibility for everyone in the organization and is not limited to a particular, specialized department. Executives, managers and professionals have access to computing/processing resources that can be made accessible, as needed.
- More rapid innovations are being made possible on the jobs, and failure is becoming an option [5]. Cloud computing provides resources for tests and simulations that previously took months to conduct [5].
- End-users can design their own applications. It commenced with the "mash up" scenarios — in which non-technological users could rapidly and easily build interfaces using platforms such as the Google Maps to plot data points.
- Cloud computing offers a location for simulations and tests, it is now easy for a large business to test new ideas and/or launch them with smaller investments than before.

XI.   Boost to Global Economy

Cloud computing used to be a common word for IT fanatics, but now a days, it is viewed as a tactical strategy to give a boost to business sales and performance [6].

- Improving the system's overall performance, according to 80% of the feedback, is one of the most significant factors in moving to the cloud; while 76% of the executives recognized economic factors as one of the main drivers in cloud migration and also 76% said that technical benefits are just as important [6].
- About 25% of the executives said that about "10%" of their core IT runs on the cloud platform, while

less than "10%" said that they do not have early plans to move to the cloud based services [6].

● The outcomes show that out of 900 executives; 81% said they have moved some of their business solutions to cloud computing [6].

XII. Cloud Computing in Education

The worth of human civilization is not in how much it earns but how much it knows [7]. It is knowledge that drives to advancement, and ultimately human comfort.

● A distributed management system can considerably reduce the load, leveraging efficiencies across the nationwide school network. The trouble of small classrooms could be overcome through virtual classrooms, with students attending classes in their homes on their personal computers, with the teacher being present virtually hundreds, or thousands of miles away [7].

● The students can work on the cloud, cooperate with their classmates and share knowledge, and be sure that they won't leave their homework assignments when they go to school. Since their work is on the cloud they can access it anywhere [7].

● Many colleges do not have sufficient hardware and software to provide students with a complete learning experience. With the help of SaaS and IaaS, even a small budget will allow students access to the latest technologies in the market [7].

XIII. Cloud Computing in Health Care

● With the help of cloud computing, the patients' records can be easily sent to the experts of medicine and effective treatment can be provided in time.

● The costs of transferring the patients only for the reference is reduced as the reports can be sent through the cloud to the specific faculties.

● Future incorporation with cloud-hosted analytics capability will provide health professionals with the ability to perform exploration and measurement using aggregated data.

● Cloud computing also helps to secure data that is shared between different parties, enhancing collaboration, interpretability and ultimately patients' care.

XIV. Future of Cloud Computing Employment

According to Gartner's Hype Cycle, cloud computing has come to its maturity stage which leads this into a productive phase, which can be interpreted as - most of the important issues with cloud computing have been resolved to a point which makes clouds more resourceful for full commercial exploitation [4].

But this does not mean that all the problems related to it has actually been resolved, only that the risks can be managed to a certain extent. Cloud computing is still like a research topic. A number of project managers within IT will be needed because more systems will be implemented with less internal IT resources. Data integration jobs will dramatically increase because the use of multiple cloud-based traders may cause data break up that has been integrated into a cohesive data model [4]. IT Professionals with in-depth knowledge of private and hybrid clouds will be in high priority as large companies try to implement cloud-based technologies inside their data centres [4]. Infrastructure Engineers will be in demand due to the increased need to move data into and out of the data centres and the high availability and throughput that are required to reduce the latency inherent in cloud-based applications. Skilled security specialists will be required for cloud traders [4].

XV. Conclusion

Grid computing was the last research which led to centralised approach

● However, the concerns are that the mainstream acceptance of cloud computing could cause many problems for the users.

- A lot of new open source systems appearing that you could install and run on your local cluster of systems.

- Cloud Computing is in a stage of growth, but this technology still has some issues of security and is somewhat immature. Government Technology Research Alliance (GTRA) research showed that most common concerns about implementing Cloud Computing technology is privacy and security [8].

- The real worth of cloud computing is that it makes your library associated software and data available everywhere including the latest smart phone devices.

- We are all aware that a country like India faces problems like digital divide and of course very low internet bandwidth. So, benefits of this new technology can reach only a limited part of educational arena.

- It is the responsibility of various cloud hosting service providers to create awareness among the users to make use of new and innovative technology, and to create expert job seekers. The environment of cloud computing is very vast and ever increasing so as to start a cloud based training program can be a good stroke in terms of establishing dominance in cloud hosting industry.

- Cloud computing offers benefits to organizations and practicing individuals. There are also security and privacy concerns. If you are considering a cloud service, you should think about how your organization's sensitive information, and that of your customers, can best be protected. Paying attention and review of the terms of service or contracts issues/challenges the provider to meet your needs.

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