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Evaluating Cloud Service Vendors with Comparison

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Abstract: In this paper we reviewed the technical and service aspects of different Cloud providers and presents the comparisons of these selected service offerings in cloud computing. By this User can have good understanding regarding services provided to avoid bottlenecks are also obstacles that could limit the growth. This comparison of cloud service providers, to serve as a starting point for user looking to take throw service and for Selecting the better one for there need into cloud environment .

Keywords: Cloud Computing, Service Vendors, Cloud Services.

I. Introduction

As the use of computers in our day-to-day life has increased, the computing resources that we need also grown up. It was costly to buy a mainframe and computer's, it became important to find the alternative ways to get the greatest return on the investment, allowing multiple users to share among both the physical access to the computer from multiple terminals and to share the CPU time, eliminating periods of inactivity, which became known in the industry as time-sharing[1]. The origin of the term *cloud computing* is vague, but it appears to derive from the way of drawings of stylized clouds to denote networks in diagrams of computing and communications systems.Cloud computing is a paradigm shift in which computing is moved away from personal computers and even the individual enterprise application's to a 'cloud' of computers. "Cloud computing is where data and services reside in massively scalable data centres in the cloud and can be accessed from any connected devices over the internet". In cloud services users are given access to application software and databases. The cloud service offering companies manage the infrastructure and platforms on which the applications run. SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis. Providers generally charge price using a subscription fee.
Following are the types of cloud computing Services:[2]

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)
- Network as a service (NaaS)
- Storage as a service (STaaS)
- Security as a service (SECaaS)
- Data as a service (DaaS)
- Database as a service (DBaaS)
- Test environment as a service (TEaaS)
- Desktop virtualization
- API as a service (APIaaS)
- Backend as a service (BaaS)

According to services, cloud vendors now compete for customers, cloud computing services can be divided into Software-as-a-Service(SaaS), Platform-as-a-Service(PaaS) and Infrastructure as a Service(IaaS), etc

Platform as a Service (PaaS) Providers:
If no presence of platform, there would be no Applications (Apps), and no need for cloud infrastructure. Another was developers build and deploy their applications to the cloud. The goal is to be able to quickly and efficiently design and deploy applications, and make them function reliably.

Infrastructure as a Service (IaaS) Providers:
Infrastructure-as-a-service (IaaS) providers to serve up as a preliminary point for anyone looking to receive a IaaS cloud services. The Infrastructure as a Service (IaaS) market, has proven to be one of the most exciting ones in the cloud space, and there have been several important factors, such as changes in pricing strategies, Pricing information, Compatibility operating Systems and languages, supporting services and many other have to be considered in order to choose particular service provider[2][13].

Software as a Service (SaaS) Providers:

This is where cloud computing extends from infrastructure and platforms into business systems and user programs. From productivity applications and CRM app's suites to software programs which manage cloud applications and deployments and even enable the creation of hybrid clouds, software as a service (SaaS) is exceptionally broad and runs the scope. Here we consider cloud software and application providers that are performing in different way, something new or something predominantly well. From traditional business scheme like Salesforce.com to superior analytics from Cloud9, whatever it's they are doing, they seems to be cool in doing it[14].

II. Different Service Providers:

A very large number of cloud computing providers have raised that offer's different services. The services provided depends on user needs and many fulfilment issues that raised to resolve their concerns, Service provided based on the kind of data and application for which the cloud is being used.

II.I Popular Service Provider with Respective Services

- **Platform as a service (PaaS) Providers:**

Amazon's AWS, Appistry's CloudIQ platform, AppScale, Engine Yard, CA AppLogic, Flexiant's public cloud platform, Force.com, Salesforce., gCloud3 gPlatform, GigaSpaces, Gizmox's Visual WebGui, google, GridGain's, long jump,. Microsoft's cloud platform, Windows Azure, Open stack.orangeScape, OS33, Out systems, RightScale, ThinkGrid.

- **Infrastructure as a Service (IaaS) Providers:**

Amazon Web Services, AT&T's, BlueLock, CA Technologies, Datapipe leverages Amazon Web Services, ENKI, Enomaly, Private cloud infrastructure is the name of the game for Eucalyptus, GoGrid, HP, Joyent's, Layered Tech's Logicworks, NaviSite, OpSource, Late last year, Savvis,Terrremark, Verizon.

- **Software as a Service (SaaS) Providers:**

Eloqua,Cloud9, MeghaWare, Apprenda, AppDynamics, Akamai, AccelOps, Abiquo's CloudSwitch, CloudTran, Cumulux, Marketo, Intacct, FinancialForce, Eloqua, Pardot, Oracle's on demand, NetSuite, Pardot, Salesforce.com, SAP Business ByDesign. As there are many vendors but we are considering some of service providers and analysing them by viewing them in different dimensions. Providers like Salesforce, IBM, HP, RackSpace, AT&T Synaptic are considered for enhancing from different dimensions.

III. Current Service Vendors History:

III.I Saleforce:

Salesforce.com was set in motion in 1999 March by Oracle executive Dave Moellenhoff, Marc Benioff, Frank Dominguez, and Parker Harris as a company specializing in software as a service (SaaS).Harris, Dominguez and Moellenhoff, three software developers previously at the initial sales automation software[12]. Salesforce.com headquarter was located in San Francisco, California, with regional headquarters in Dublin , Singapore and Tokyo. Salesforce.com has translated services into 16 languages and currently has 82,400 customers and over 2,100,000 subscribers. In January 2011, salesforce.com was documented as one of Fortune's 100 best companies to work for in 2011, receiving the 52nd spot. Salesforce.com has it's is best known for its Customer Relationship Management (CRM) products and, through acquisition, has expanded into the social enterprise area. Saleforce is a well known and successful business because of its advanced CRM system.

III.I.I Services Offered by Salesforce:

Sales cloud, service cloud, and social chatter,.

III.II RackSpace:

RackSpace is one of IT hosting company located in San Antonio, Texas, USA. There data centers present in service in Illinois, Virginia, the United Kingdom, Australia, Texas, and Hong Kong.

In the years 2011 & 2013, the company has taken place in one of the top 100 place, work by Fortune Magazine.[8][9] Rackspace.Although the initiator began as an application developers for end-users, they founded that most of the companies did not know the Process to host their applications, or would not like to involve in hosting . The originator needs to focus on app's development– but not in hosting–but they were incapable to find a way for opportunity to outsource the hosting process.

III.II.I Business model in RackSpace:

Rackspace has two service-level segments: Managed and Intensive. These both service levels obtain support through live chat, telephone, ticket system , and e-mail, but they are intended to serve the needs of different businesses.

The **Managed** support level contains "on-demand" support where proactive services are provided, but the customer can contact Rackspace when they are in need of additional support.

The **Intensive** support level consists of "proactive" support where numerous proactive services are provided, and customers receive other consultations about server configuration to them. Extremely customized implementations generally come under this category of support.

On Oct 2006, Mosso Inc. was launched, which experimented with white-labeling hosting services.[15] This division is groundwork for Rackspace's Present Cloud Computing offering. In 2008 Oct 22, Rackspace declared that it attained Slicehost, virtual servers[16] provider and Jungle Disk, provider for online backup software and services.

Rackspace announced that it consists of process to implement OpenStack Computing as the basic technology for their Cloud Servers product in April 2012. With this changed a new control panel in addition to that add-on cloud services providing server monitoring, block storage, databases and virtual networking.

III.III IBM(International Business Machines):

IBM cloud structure starts with the physical hardware of cloud. IBM proposes 3 hardware platforms for cloud computing[3]. The provided platforms give's built-in support for virtualization. Next following layer of the IBM framework is virtualization. IBM has involved with virtualization over 40 years[3] and suggest IBM Websphere. IBM cloud technologies come into view from the combination of two of IBM's leading technologies: Mainframes and Virtualization[15]. In 1960s IBM's 1st experiments in virtualization with development of virtual machine (VM) IBM first began to develop a clear strategy for cloud computing in 2007, stating its mission to build clouds for enterprise clients and provide services to fill gaps in existing cloud environments. Since 2011, adoption of IBM SmartCloud solutions has increased rapidely. The usage of IBM cloud in April 2011 was 80% of Fortune 500 companies. Also the software and services are utilized by more than 20 million of end-user customers from worldwide. Some of their clients include American Airlines, and 7-Eleven, CARFAX, Aviva Frito-Lay, and IndiaFirst Life Insurance Company[10].

III.III.I IBM Offer Cloud Services:

- **Design and Build:**
  - Design a Cloud, Build a cloud, Migrate to cloud.
- **Secure and Manage:**
  - Secure your cloud, Manage your IT security with cloud, Manage your infrastructure
- **Store and Virtualize:**
  - Store your data in the cloud, Virtualize your infrastructure with cloud
- **Recovery:**
  - Back up and recover your business data.

Design and Build Cloud:

Designing and building a cloud background can be off-putting task. You need to be confident that you selected the best delivery model and workloads to migrate to the cloud. The cloud implementation may take a major dedication of time and resources. IBM's cloud professional helps you to gather speed your adoption of cloud. We make use of our IBM Research-developed tools to assist you develop your approach. we can help you to design and deploy a cloud environment by the assistance of established methods and experts.

Secure and Manage:

We need to manage the health, performance and security of your data center. With cloud-based services from IBM, you can reduce the complexity and cost of managing multiple security devices and technologies. And you can access robust IBM software over the cloud to control your IT infrastructure or optimize your service desk support. If you have already implemented a cloud environment, IBM can also help you gain insight into the security strengths and vulnerabilities of your cloud environment. IBM is accepted as global organizer in end-to-end IT security solutions and software as a service offerings.

Store and Virtualize:

Access solutions from IBM enterprise-class virtual infrastructure for cloud-based storage, desktop and Infrastructure as a service(IaaS). Built with help of IBM architectures, management tools and resources—toughened many customer cloud activities and IBM's internal cloud implementations, In order to meet lower capital and operational costs in project and for scalability and security. The storage and virtualization solutions are designed.

Recovery:

Cloud technology can be helpful faster and cost-effective recovery in the occurrence of a distraction, data loss or a tragedy. IBM provides a collection of solutions—That includes backup services, server recovery and data protection—for helping you to supervise risk, lessen costs and meet narrow observance authorization. With added 40+ years of experience in business spirit and information security and resiliency centers over the world, IBM provides solutions for on-site, off-site and hybrid cloud-based data protection.

III.IV AT&T Synaptic:

The **History of AT&T** dates back to the invention of the telephone itself. The Bell Telephone Company was established in 1879 by Alexander Graham Bell, the inventor of the telephone. Bell also established American Telephone and Telegraph Company in 1885, which acquired the Bell Telephone Company and became the primary phone company in the United States. This company maintained a monopoly on telephone service in the United States until anti-trust regulators split the company in 1982[6]. One of these resulting companies, Southwestern Bell, later purchased the original AT&T and took the AT&T name in 2005 - this is the company known as AT&T today.

why you need AT&T Platform as a Service: A complete development environment to build and launch custom applications quickly, run them reliably and manage them easily across the full application lifecycle. As an AT&T Cloud

Service, AT&T Platform as a Service can also deliver the high performance you need and the low per-user price you want.

AT&T Platform as a Service provides cloud-based, self-service tools:

- Sign up for AT&T Platform as a Service online
- Provision the virtual resources you need
- Create a development environment within minutes
- Avoid long procurement cycles
- Reduce capital equipment expenses
- Speed development with 50 pre-loaded, customizable templates
- Build applications without writing a single line of code
- Quickly automate, change and support a wide range of business processes
- Enable non-traditional developers to build applications

III.V Current HP History:

HP Cloud Services was announced on March 14, 2011, and launched as a public beta on May 10, 2012. HP Fellow, and MySQL author, Brian Aker announced the Relational Database Service on stage at the 2012 MySQL User's Conference. HP Cloud Object Storage and HP Cloud CDN (Content delivery Network) were moved into general availability on August 1, 2012. On December 5, 2012 HP Cloud Compute moved into General availability[7].

The HP Cloud Services Enablement for Infrastructure as a Service (HP CSE for IaaS) solution is a pre-integrated,end-to-end solution for communications service providers that enables them to create a complete compute services-on-demand offering for their small and medium business customers. It Includes the HP Aggregation Platform for SaaS, HP Cloud Service Automation, and HP BladeSystem Matrix servers. (Other third-party infrastructure can be supported as well.)

The HP CSE for IaaS also leverages HP Cloud Service Automation (HP CSA) software, which facilitates the deployment of successful private cloud architecture. HP CSA automates key IT processes for private or public cloud environments, resulting in one consistent approach to IT management for resources regardless of environment. CSA enables full lifecycle management including application and infrastructure provisioning, monitoring, patching, and compliance.

III.V.I HP Cloud Services Solutions

- Data Archival as a Service
- Backup as a Service
- Collaboration as a Service
- PC and Mobile Backup and Synchronization
- Big Data Processing
- Enterprise Application Migration.
- Web & Mobile Apps
- Test & Development Converged Cloud.

III.V.II HP Cloud Services Products

- HP Cloud Object Storage
- HP Cloud Content Delivery Network (CDN)
- HP Cloud Block Storage
- HP Cloud Compute
- HP Cloud Relational Database for MySQL
- HP Cloud Identity Service
- HP Cloud Application Platform as a Service.

Table 1 Service Vendors with Respective Dimensions considered for comparative Evaluation

Dimensions considered		Salesfroce	IBM	HP	Rack Space	AT&T Synaptic
Supporting Services	Computing Categories	PaaS,SaaS	IaaS	IaaS	IaaS	PaaS
	Free Support	Yes	Yes	Yes	Yes	Yes
	Phone	Yes	Yes	No	Yes	No
	Forms	Yes	Yes	Yes	Yes	Yes
	On line Resources	Yes	Yes	No	Yes	Yes
	Urgent Response	24/7 Yes	No	24/7 Yes	24/7 Yes	24/7 Yes

Compatibility	**Languages Supported**	Java PHP Python SQL	Yes Yes No SOQL,SOSL	No No No No	Yes No No Yes	All (Root serer Access)	No No No No
	Operating System	Linux OS Windows XP Cent OS Fedora	Yes Yes No No	No Yes No No	No No Yes No	No No Yes Yes	Yes Yes No No
Security Features	Free Security Features	Email/Password Security Back up Storage Critical Data privacy Data Protection Persistency Firewall Protection	Yes Yes Yes Yes Yes Yes	No No Yes No No No	No No No No No No	No No Yes Yes Yes No	No No Yes Yes No(Extra) No
	Paid Security Features	Snap shot Backup Critical Data privacy Back up Storage Intrusion Detection Data Encryption	All security features that are provided in SalesFroce is Free of Cost	No No Yes Persistency No	No No No No No	Yes No Yes No No	No No Yes Persistency No
Pricing Information		Base Plan Details	One month free edition, with 1 GB of storage.	One Virtual 32 bit CPUs with 1.25GHz 2 Gb Virtual memory,60 GB Instance storage	Pay as you go on subcription	256 MB RAM, 10GB local storage, 10 Mbps Network throughput	Pay-as-you-go service that is billed based on your actual usage each month. The service has two pricing components data access type and storage policy
Additional Features		View/Edit Files File Hosting Service Monitoring Free Support Virtual Private Server Auto Scaling	Yes No Yes (Free) Yes No No	No Yes ExtraCharge Yes ExtraCharge Yes (Free) Yes (Free) No	Yes No Yes (Free) No Yes (Free) No	Yes Yes ExtraCharge No Yes (Free) Yes (Free) Yes (Free)	Yes Yes Extra Charge Yes (Free) Yes Yes Extra charge No
Controlling Interface		Web Based Application/Control Panel API (Application Programming Interface) Command Line Interface Graphical User Interface	Yes Yes No No	Yes Yes No No	No Yes No No	Yes Yes No No	Yes Yes No Yes

IV. ANALYZING CONCERNS

IV.I Analyzing Cloud Concerns:

- **Cost reductions / optimizations**
  - **Variety of Pricing Plans -** The more variety offered (hourly, monthly, etc), the better a provider is considered.
  - **Average Monthly Price -** Estimated cost in US$ for a 1 CPU, 2GB RAM cloud server (or the nearest best option), averaged over datacenters for companies with location-based pricing, and averaged over Windows/Linux servers. When available, hourly pricing was used, based on 730-hour months. Otherwise, monthly pricing was used[4].
  - **Cost of Outbound Data Transfer** - The cost, in US$, for each GB of outbound data sent from the server. Companies that offer a per second (Mbps) connection for free have costs listed as zero[4].
    - **Cost of Inbound Data Transfer -** Same as above, but for inbound data.
    - **Storage Costs -** Average cost per GB of persistent storage. While most VMs will come with some storage included, if you want true persistent storage you have to do it externally.

- **Scalability and Automation**
  - **APIs -** If the company offers APIs to interact with the servers or not.
  - **Monitoring -** A 3-level subjective scale measuring the easy availability of monitoring tools:
    Poor - Companies that have no monitoring/alert solutions integrated, requiring the deployment of third-party tools or that extra services be purchased
    Average - Companies with very simple integrated monitoring tools (few indicators or no alerting)
    Extensive - Companies with very complete integrated monitoring tools offered for no additional cost

- **Choice and Flexibility**
  - **Number of Instance Types** - The number of different available instance types, in terms of RAM, CPU, disks and so on.
  - **Supported Operating Systems -** The number of different supported operating systems (regardless of version) available as pre-configured images.

IV.II User Concerns For Analyzing

- **Security Features**
  - **Protection** - If the vendor offers the possibility of protecting servers with firewalls and other security functionality. A 3-level subjective scale[5][6]:
    Poor - Companies that only offer the most basic security features (such as a basic firewall), or no features at all
    Average - Companies that offer a more advanced mix of security features.
    Extensive - Companies that offer not only several security features, but also some security automation.

- **Ease of Migration**
  - **Open Standards -** If the vendor employs or supports open standards in cloud infrastructure.
  - **VM Upload** - If the vendor supports uploading your own machine images (made locally) to the cloud

- **Reliability**
  - **Service Age -** How long the service has been around.
  - **Service Level Agreement (SLA)** - The uptime SLA offered (regardless of past performance), in percentage points.
  - **Support** - A 3-level subjective scale:

Poor - Companies that only offer on-line forums for free; any other support must be paid
Average - Companies that offer a single type of 24×7 support for free (either phone-based or on-line chat), in addition to forums
Extensive - Companies with multiple support offerings included in the base price

Dimensions considered can give a much better view of the different providers. I've also increased the number of companies in the comparison. This is a result of adding new companies Salesforce, IBM, AT&T Synaptic,Rackspace,and HP

V. Conclusion

As there are many vendors, Providers like Salesforce, IBM, HP, RackSpace, AT&T Synaptic are considered for enhancing from different dimensions.As a Service market, however, to prove one of the most exciting ones in the cloud space, and there have been several important factors, such as changes in Pricing strategies, Compatibility operating Systems and languages, supporting services and the entrance of some technology heavy weights. I wrote a comparison of cloud service providers, to serve as a starting point for anyone looking to take the throw into cloud computing. Obstacles

present a number of new research opportunities in cloud computing to advance the technological aspects of cloud computing, and highlighted the resulting directions of research in Future.

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