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CLOUD COMPUTING - COST BENEFITS FOR THE SMALL BUSINESS

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Abstract

Cloud computing has been defined as the practice, or a model, of using a network consisting of remote servers that are hosted on the internet for storage, management, accessing and processing of data.

In cloud computing, shared data, information and other resources are provided to the computers and devices within the network on demand by the organisation. All the servers, applications, storage and other services are delivered to the recipients or destinations within the organisation through or via the internet.

Reduction in operating costs of organisations due to exclusion of hardware platforms along with human operators for software applications, maintenance and development is being seen as a major benefit of cloud computing.

However, this aspect of cost saving by the use of cloud computing for small businesses is still diffuse. This research paper attempts to verify if such cost benefits do accrue to them.

Keywords: Cloud Computing, Public Cloud, Private Cloud, Hybrid Cloud, Cost Benefits, Small Business.

Introduction

Cloud Computing

Cloud Computing is fast emerging as a choice for conducting IT activities of business organisations in today's world. Initially it was advocated by big to mid-size businesses. However even small businesses can adopt cloud computing in their operations and derive cost benefits from it.

Cloud computing is defined as the practice, or a model, of using a network consisting of remote servers that are hosted on the internet for storage, management, accessing and processing of data. It is very different from the traditional practice of storing, managing and processing data on the hard drive of a personal computer or, for many small businesses, on a local server. In other words, the major difference is in the sharing of resources; cloud computing allows sharing, while using only the personal computer or local server does not.

Another way to describe it would be to use the term "on-demand computing". This is because, in cloud computing, shared data, information and other resources are provided to the computers and devices within the network on demand. And since it is internet-based, all the servers, applications, storage and other services are delivered to the recipients or destinations within the organization through or via the internet.

In cloud computing, groups of servers are made to run on (usually) low-cost and low-end technology (such as the basic personal computers) that have been configured for specialized connections. These server groups make up networks that, through the internet, distribute all the data processing tasks among them.

Currently, there are no fixed standards for cloud computing, which means it is up to the companies to define and design the cloud computing technologies that they are using. Many find this preferable, since it allows for greater customization and, along with it, control by the company. Of course, companies that provide this type of service are bound to have their own standards, which the businesses availing of their services would have to follow or conform to.

Types of Cloud Computing

Public Cloud

In this type of cloud computing, service providers are the ones who are sought by businesses. The service provider is the one to make the applications, storage and other resources, and make them available to the general public, mainly over the Internet.



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Many businesses prefer a public cloud because of its ease of use and installation; they won't set it up or install it the provider will do it for them. There is also the added advantage of being inexpensive, particularly those who are operating within a tight budget. They no longer have to worry about investing on hardware and application, as well as bandwidth costs, since the service provider will have them, all covered.

Cost efficiency is a bigger advantage in this type of cloud computing as one has to pay what one actually uses. There are no wasted resources, such as applications or storage that you are paying for but do not need or actually even using, because you will be given only what you need. Therefore, one will not be made to pay for those resources that one is not able to use to begin with.

Private Cloud

This type of cloud is one that is managed by the business or the organization that uses it. Seeing as it is owned by the company, full control and customization is within the organization. The benefits are nearly the same as those that are obtained from a public cloud, except for the issue on ownership. In addition, private cloud also beats a public cloud in terms of security. By keeping the management of the computing resources in-house, firms are limiting access and, consequently, security issues and leaks.

However, there is cost involved since the company would have to allocate some of its resources to the payment of salaries and wages of personnel it will assign to manage the cloud. In some cases, the organization can even create a dedicated department or division to take charge of the job. There are also other expenses that will have to be incurred in cloud management, such as the cost of virtualization and other management tools that will be used by the personnel managing it.

Hybrid Cloud

This combines features of public and private cloud, so it involves the management and maintenance of internal as well as external providers. Aside from personnel employed by the business to manage the cloud, third party service providers are also called in. This is generally preferred by many businesses because of its flexibility, as workloads are allowed to be moved between the platforms, especially in the face of changes in the company's computing needs and the costs incurred in managing the cloud.

What businesses who employ this type of cloud computing do is to entrust their less sensitive and critical resources to an external public cloud service provider, while leaving the more critical ones in-house, in the hands of their IT department.

This type of cloud deployment is highly recommended for business with large or voluminous transactions, or those with complex operations. Of course, businesses would have to first assess their needs before they can decide which type of cloud computing they should use in their company.

Cloud Service Offerings

IaaS, PaaS and SaaS are the three most popular types of cloud service offerings. (They are sometimes referred to as cloud service models or cloud computing service models.)

- **IaaS**, or Infrastructure as a service, is on-demand access to cloud-hosted physical and virtual servers, storage and networking - the backend IT infrastructure for running applications and workloads in the cloud.
- **PaaS**, or Platform as a service, is on-demand access to a complete, ready-to-use, cloud-hosted platform for developing, running, maintaining and managing applications.
- **SaaS**, or Software as a service, is on-demand access to ready-to-use, cloud-hosted application software.

IaaS, PaaS and SaaS are not mutually exclusive. Many mid-sized businesses use more than one, and most large enterprises use all three.

'As a service' refers to the way IT assets are consumed in these offerings - and to the essential difference between cloud computing and traditional IT. In traditional IT, an organization consumes IT assets - hardware, system software, development tools, and applications - by purchasing them, installing them, managing them and maintaining them in its own on-premises data center. In cloud computing, the cloud service provider owns, manages and maintains the assets; the customer consumes them via an Internet connection, and pays for them on a subscription or pay-as-you-go basis.



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So, the chief advantage of IaaS, PaaS, SaaS or any 'as a service' solution is economic: A customer can access and scale the IT capabilities it needs for a predictable cost, without the expense and overhead of purchasing and maintaining everything in its own data center. But there are additional advantages specific to each of these solutions.

IaaS

IaaS is on-demand access to cloud-hosted computing infrastructure - servers, storage capacity and networking resources - those customers can provision, configure and use in much the same way as they use on-premises hardware. The difference is that the cloud service provider hosts, manages and maintains the hardware and computing resources in its own data centers. IaaS customers use the hardware via an internet connection, and pay for that use on a subscription or pay-as-you-go basis.

Typically, IaaS customers can choose between virtual machines (VMs) hosted on shared physical hardware (the cloud service provider manages virtualization) or bare metal servers on dedicated (unshared) physical hardware. Customers can provision, configure and operate the servers and infrastructure resources via a graphical dashboard, or programmatically through application programming interfaces (APIs).

IaaS can be thought of as the original 'as a service' offering: Every major cloud service provider -Amazon Web Services, Google Cloud, IBM Cloud and Microsoft Azure - began by offering some form of IaaS.

Benefits of IaaS

Compared to traditional IT, IaaS gives customers more flexibility builds out computing resources as needed, and to scale them up or down in response to spikes or slow-downs in traffic. IaaS lets customers avoid the up-front expense and overhead of purchasing and maintaining its own on-premises data center. It also eliminates the constant trade-off between the waste of purchasing excess on-premises capacity to accommodate spikes, versus the poor performance or outages that can result from not having enough capacity for unanticipated traffic bursts or growth.

PaaS

Provides a cloud-based platform for developing, running, managing applications. The cloud services provider hosts, manages and maintains all the hardware and software included in the platform - servers (for development, testing and deployment), operating system (OS) software, storage, networking, databases, middleware, runtimes, frameworks, development tools - as well as related services for security, operating system and software upgrades, backups and more.

Users access the PaaS through a graphical user interface (GUI), where development or DevOps teams can collaborate on all their work across the entire application lifecycle including coding, integration, testing, delivery, deployment, and feedback.

Examples of PaaS solutions include AWS Elastic Beanstalk, Google App Engine, Microsoft Windows Azure, and Red Hat Open Shift on IBM Cloud.

Benefits of PaaS

The primary benefit of PaaS is that it allows customers to build, test, deploy run, update and scale applications more quickly and cost-effectively than they could if they had to build out and manage their own on-premises platform.

SaaS

SaaS (sometimes called *cloud application services*) is cloud-hosted, ready-to-use application software. Users pay a monthly or annual fee to use a complete application from within a web browser, desktop client or mobile app. The application and the entire infrastructure required to deliver it - servers, storage, networking, middleware, application software, data storage - are hosted and managed by the SaaS vendor.

The vendor manages all upgrades and patches to the software, usually invisibly to customers. Typically, the vendor ensures a level of availability, performance and security as part of a service level agreement (SLA). Customers can add more users and data storage on demand at additional cost.

Today, anyone who uses a or mobile phone almost certainly uses some form of SaaS. Email, social media, and cloud file storage solutions (such as Dropbox or Box) are examples of SaaS applications people use every day in their personal lives. Popular business or enterprise SaaS solutions include Salesforce (customer relationship management software), HubSpot (marketing software), Trello



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(workflow management), Slack (collaboration and messaging), and Canva (graphics). Many applications designed originally for the desktop (e.g., Adobe Creative Suite) are now available as SaaS (e.g., Adobe Creative Cloud).

Benefits of SaaS

The main benefit of SaaS is that it offloads all infrastructure and application management to the SaaS vendor. All the user has to do is create an account, pay the fee and start using the application. The vendor handles everything else, from maintaining the server hardware and software to managing user access and security, storing and managing data, implementing upgrades and patches and more.

CLOUD COMPUTING FOR SMALL BUSINESSES

Having seen the main benefits that businesses can derive from using cloud computing, a more specific and focused analysis on small businesses is being given

Lower costs, more savings, higher profits

Small businesses are fully aware that they need hardware in order to facilitate their operations. But hardware does not come really cheap, and so some of them have to forcibly close their eyes and buy more hardware as their need increases. With cloud computing, hardware becomes more efficient. What they used to do using a roomful of computers can now be accomplished with just one or two units of hardware, situated in one corner of the office premises. In some cases, small businesses do not even have to buy new servers or powerful (and often expensive) machines, because by availing the services of a third-party provider, they will only have to pay a fee corresponding to what they used.

So, the point is about less capital expenditure on hardware and software, less physical floor area and rack space to accommodate hardware, and less electrical usage and power consumption. Even upgrading and maintaining hardware costs money, and those are costs that you can also do away with through cloud computing.

Computing services also cost money, and some even find the offerings of some service providers to be expensive. However, a simple cost-benefit analysis is most likely to reveal that the cost of paying these providers will be considerably lower than how much a small business would spend by going traditional.

Lower costs mean that the small business will register higher net earnings, as well as more savings. It will also be able to put its resources to other ventures that will boost the business further.

However, before taking the decision of, it is important to have a clear idea about the present spending on IT infrastructure and how it compares to the price of Cloud solutions.

How to calculate total cost of ownership of servers

The best way to calculate the cost of ownership is to take a look at all the costs: direct, indirect or hidden.

Direct costs are linked to any of the hardware required for an on-premises solution. This can range from actual servers to the server room where these are stored. It also includes electricity and HVAC (heating, ventilation and air-conditioning).

On the other hand, indirect costs are related to the salaries paid to the System Administrator and any other IT staff member who maintains the hardware or fixes software bugs.

Example of hidden costs could be lost productivity due to downtime.

For a typical small business (with investment in plant and machinery between Rs.25 Lakhs and Rs. 5 crores) the cost calculation could be as follows with price approximations for maintaining own IT infrastructure.

1. Requirement in term of CPU, RAM and Disc space - Average

Initial cost of a Server for a small business from HP, Dell or Lenovo is about

Rs. 90,000 to Rs. 2,50,000. Let us assume it to be Rs. 1,25,000.

(2 vCPUs, 8GB of RAM, 512GB of disk storage).

Assume life of the server to be about 5 years. So monthly cost translates to

1,25,000/ 60 = Rs. 2083

2. Cost of 2 Desktop PCs with accessories such as UPS, Printer, and Stationary etc.



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(Assuming life of 5 yrs.) – Rs. 1,10,000/60= Rs. 1833

3. Electricity cost of the server hosting room with AC, Ventilation etc. at 10 hours of operation = Rs. 9000 per month
 4. Salary of System Administrator and Computer operator = Rs.70, 000 per month
 5. Cost of Downtime in terms of productivity loss, order loss etc. considering average 1 hour of downtime per month = Rs. 2,00,000
- Total Cost = Rs. 2, 82, 916 per month approx.**

Let us compare this with use of Cloud services (IaaS)

As per present market the cost of using dedicated server with guaranteed uptime of 99.99% is as given below:

1. For Server with 2V CPU, 4GB RAM, 2X 1 TB SSD – Rs. 12,499 per month (As per offer from server basket ref. www.serverbasket.com)
 2. Cost of 2 Desktop PCs with accessories such as UPS, Printer, Stationary = Rs. 1833per month (As computed above)
 3. Salary of Computer operator - Rs. 20,000 per month
 4. Ventilation and AC charges – Rs. 4000 per month at 10 hours of daily operation
- Total Cost = Rs. 38,332 per month approx.**

So monthly cost savings could be around 86% for such a Small Business after choosing to opt for Cloud based Server service (IaaS).

The above is just an indicative assessment of cost savings that may accrue to a small business if it chooses to use Cloud Services in IaaS mode.

However, the cost calculations would vary with the capacity of server being used and in case of use of PaaS and SaaS modes by the organisation, the specific usage time, hardware configurations and software application requirements.

Further studies are required in this area to establish the degrees of cost benefit derivable from the use of the various modes of Cloud Services by small businesses.

References

- i. www.serverbasket.com
- ii. www.businessnewsfaily.com
- iii. www.investopedia.com
- iv. www.servermania.com