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| * [Introduction](https://sites.google.com/site/sau275/home) * [Case Studies for MIS](https://sites.google.com/site/sau275/case-studies-for-mis)   + [MIS Case Schedules](https://sites.google.com/site/sau275/case-studies-for-mis/miscaseschedules) * Cloud Computing * [Convocation Programme](https://sites.google.com/site/sau275/convocation-programme) * [ExcelFiles](https://sites.google.com/site/sau275/excelfiles) * [MIS 2015 Content](https://sites.google.com/site/sau275/mis-2015-content) * [MIS Course Perspective](https://sites.google.com/site/sau275/mis-course-perspective)   + [Evaluation](https://sites.google.com/site/sau275/mis-course-perspective/evaluation)   + [Objective and Outcomes](https://sites.google.com/site/sau275/mis-course-perspective/objective-and-outcomes)   + [Teaching Pedagogy](https://sites.google.com/site/sau275/mis-course-perspective/teaching-pedagogy) * [MIS Course Syllabus](https://sites.google.com/site/sau275/mis-course-syllabus)   + [Assignments](https://sites.google.com/site/sau275/mis-course-syllabus/PPT_Assignments)   + [Books / References](https://sites.google.com/site/sau275/mis-course-syllabus/books-references) * [SaurabhBlog](https://sites.google.com/site/sau275/saurabhblog) * [Sitemap](https://sites.google.com/site/sau275/system/app/pages/sitemap/hierarchy) | **Cloud Computing**   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Demystifying Cloud Computing**  *Cloud computing is the key that opens the doors for enterprises to a more efficient and cost effective IT infrastructure. Everything can be served through cloud computing, and we discuss the various models you can choose from.*  In 1960, John McCarthy predicted that someday computing would be organized as a public utility. And then, in the early 90s, the term 'Grid computing' was coined by Ian Foster, which talked about technologies that would make computing power available 'on demand' to consumers. Now, both these statements suddenly make sense when we hear the word cloud computing and the technologies that have made it a reality.  Just about every organization today is interested in using cloud computing, but doesn't know how. Without knowing, it's impossible to make an informed decision about how to move to it. Simply put, cloud computing is a set of technologies that allows computing applications and data to be exposed as a set of services from a pool of underlying resources. The user doesn't have to worry about the technologies in the pool. This is similar to running an electrical or electronic device by plugging it to a wall socket. You don't have to worry about how the power is generated in the power plant. You just want the right voltage to be made available so that you can power your device and use your device. Similarly, in Cloud Computing, users simply focus on the services they would like to use, and not worry about how to implement the software that provides these services. Even the IT staff that provides these services can easily pull out the resources required by the users from this pool of resources, and put it back when the services have been consumed.  [Cloud Architecture](https://sites.google.com/site/sau275/cloud-computing/cloud1.JPG?attredirects=0)   |  | | --- | |  | | A typical cloud computing model. |   The foundation of cloud computing comprises of data centers (servers, storage, networking), the business applications and middleware, virtualization software and of course operating systems. This foundation provides all the applications to the users on a 'pay as you go' basis. So the entire workload shifts to the cloud, i.e. local computers are not burdened with running hundreds of applications anymore. All that users need is a system interface software, like a simple web browser to be run on their side.  **The benefits**  The promise of cloud computing is to provide all that most organizations have been wanting for years, but haven't been able to achieve.  **Scalability:** Cloud computing allows an organization to scale up or down their IT requirements quickly and efficiently, without hampering productivity. It cuts down the time involved in buying & setting up additional hardware, software & other necessary resources everytime a new service is required.  **Lower infrastructure cost:** Pay as you go is the mantra of cloud computing. You pay only for the duration that you use the service for. This helps cut down unnecessary capital expenditure. Since the resources can be pulled out and restored dynamically, a lot of cost related to maintenance, administration, etc is reduced.  **Better utilization:** As the IT infrastructure is nothing but a pool of resources, it reduces wastage and improves resource utilization. It also cuts down the downtime.  **Demystifying Cloud Computing**  **Cloud deployment models**  Most of the time, the term cloud computing is confused with the Internet cloud. It's very important to understand this difference if you want to be able to use the cloud more effectively. There are basically three types of cloud-public, private, and hybrid.   |  | | --- | |  | | The three different types of clouds & the relationship amongst them  [https://sites.google.com/site/sau275/_/rsrc/1317036854857/cloud-computing/cloud2.JPG](https://sites.google.com/site/sau275/cloud-computing/cloud2.JPG?attredirects=0) |   **Public cloud:**  This is what people normally end up talking about whenever the term cloud computing comes up. This is essentially an external cloud, provided by a service provider. It refers to the resources (hardware, software, applications) that a service provider offers you over the Internet. Email, if hosted with an ISP is the most basic and oldest type of service offered on the public cloud. Now, just about every kind of service you can think of is available in the public cloud (whole list of these services is provided elsewhere in this story). The public cloud follows the 'pay as you go' model. You only pay for the services you consume. The benefits of moving to a public cloud are many, with the key one being that you don't have to worry about managing the underlying IT infrastructure-no security patches or updates to apply, no software upgrades, etc. All these are the service provider's headache.   |  | | --- | |  | | The three components of a cloud computing network. |   ***[https://sites.google.com/site/sau275/_/rsrc/1317036885255/cloud-computing/cloud3.JPG](https://sites.google.com/site/sau275/cloud-computing/cloud3.JPG?attredirects=0)***  ***Private cloud***: A private cloud refers to having your own, private cloud computing infrastructure. So instead of relying on an external, public cloud service provider's infrastructure, you would have your own. A private cloud is more suited for a large enterprise because it has already invested heavily in its IT infrastructure, data center, apps, etc. A private cloud typically involves optimizing the existing IT infrastructure, so that it can deliver services to the users faster and more effectively. A private cloud would allow the IT team to provision for new hardware, software, and services for users as and when required. It would provide better control over the entire process of information processing. This helps reduce costs, improves response time, and provides greater flexibility.  **Hybrid cloud:** As the name implies, it is a cloud computing environment that consists of internal/ external providers, viz. a mix of private and public clouds. Secure and critical applications are hosted by organizations in the private cloud while not so critical ones are hosted in the public cloud. This combination is known as a hybrid cloud. The cloud infrastructure remains as a unique entity which is bound by a standard technology thus enabling data and application portability. A very good example of this is cloud bursting, wherein the organization for its normal usage uses its own infrastructure but moves to the cloud for peak loads.  **Types of cloud services**  Whether it's public, private, or hybrid, you could run a range of services in a cloud computing environment. These can be divided into three parts-SaaS, IaaS, and PaaS.  **SaaS:** This is the most familiar and prolific cloud service of all. As the name suggests, it provides any software application as a service through the cloud. We've all been using software as a service for years in the public domain, with the free email services being the most classic example. Today, there's a whole range of software applications available through SaaS, be it ERP, CRM, workflow systems, document management, and much more. The cloud service provider offers these services, and the users pay as they use the same. This could be on a subscription model, wherein they pay an annual or a monthly fee for the services. Everything is accessible from a web browser, so the users don't need anything more than that.  **Infrastructure as a Service:** As the name implies, IaaS is a service delivery model in which an organization is given control over different resources and applications. These resources comprise of storage, hardware, servers, networking components, etc. The consumer need not manage or control the underlying cloud infrastructure in this service model. On demand principle is used in this case as the infrastructure is provided to the user as per his requirements. It often takes the form of virtualized computing environment thus giving freedom to consumers wherein they can configure & deploy the applications in a virtual image locally. Then without the need to worry about the network infrastructure they can also execute it within the remote environment. Some of the prime examples of it are Amazon's Elastic Compute Cloud [EC2] and Simple Storage Service.  **Platform as a Service:** This component of cloud computing can be defined as a set of software and product development tools that allows developers to create applications on the provider's platform. In other words it allows you to build applications that are delivered to users through the Internet and are run on the provider's infrastructure. Cost effectiveness is one of the prime benefits of PaaS as organizations don't need to spend extra bucks for buying and managing the underlying hardware and software. PaaS offerings include facilities for application development and design, testing, deployment and hosting. Web service integration, database integration, security, storage, etc that comes under application services is also included. The prime examples are Salesforce.com's Force.com and Microsoft's Azure.  **Office Infrastructure on the Cloud**  *Microsoft Business Productivity Online Services is a cloud offering that manages your network infrastructure, licenses for each users, security, updates, backups and more*   |  | | --- | |  |   Microsoft Exchange and Windows SharePoint Services/Microsoft Office SharePoint Server (WSS/MOSS) have become ubiquitous in their usage in most modern tech-enabled companies. However, this comes with its own set of issues – you need to obtain and maintain the network infrastructure, manage licenses for each user, manage security, updates and backups and more. Not only that, when a new version of the base software comes up, you need to migrate the servers, increase capacity/load and more. This requires an entire team of specialists on call or on site for ensuring smooth operations.  This is where Microsoft's IaaS cloud offering helps – whether you are running a 5 member company from your basement or a 50,000 member global conglomerate. Microsoft Business Productivity Online Suite or simply BPOS is a cloud offering that takes care of all the issues mentioned above of hosting services for your organization.  BPOS is actually a suite of 4 different products/services from Microsoft. It comes with Exchange Online, SharePoint Online, Office Live Meeting and Office Communications Online. A quick recap of each are:  **Exchange Online:** It is a cloud-based MS Exchange offering in BPOS. It offers the full suite of the product, 25GB of mailbox size / user, ActiveSync/BlackBerry support, MAPI, POP, IMAP, SMTP, HTTPS based access and free, unlimited resource (like conference room, item, etc.) scheduling.  **SharePoint Online:** MOSS on the cloud, so to speak. You get all the features of SharePoint, including branding etc. and comes with a huge bunch of pre-installed site templates. The only limitation here is that you cannot deploy a custom application on top of this hosted SharePoint.  **Live Meeting:** It is a cloud offering to arrange voice/video meetings, trainings, webcasts and other events. You can create, attend, view and manage any kind of online meeting with this. The best part is that you can invite attendees to a live meeting without requiring them to have an account in your organization.  **Communications Online:** This is the corporate IM service from Microsoft that allows users within the organization to communicate with each other through text, voice or video. This feature alone can help reduce telephone call costs in your organization significantly.  Each of these services can of course be purchased separately. There are even more options in the form of the Deskless Worker type license that comes at a low price. If you want more than one service for a user, it might actually make more sense to simply purchase the entire BPOS suite.  The advantage of these IaaS services is that if you're a small organization, you don't need a dedicated IT team to manage servers, updates, etc. Simply managing your organization's user accounts from the simple Web based interface is good enough. If you're a mid-sized organization, a small IT team can manage things like AD synchronization with BPOS so that users are managed automatically as soon as changes are made in the local ADS. Large organizations can opt-in for the BPOS dedicated offering where MS will actually setup dedicated servers for you.  Apart from these services, there are a bunch of “add-on” services as well that are available for purchase – such as message archival, encryption, advanced filtering and others. You can even create a setup where only the top management of the organization is on BPOS, while the rest of the company uses normal POP/IMAP/SMTP accounts from any ISP. This is however a slightly more complex setup and you will require some assistance in setting this up correctly.  There are other messaging solutions available that aim at the corporate world – such as the Gmail Premium services. However, none of these have the integrated experience as well as the plethora of options and features that BPOS is able to offer. For instance, Gmail doesn't have the concept of “Shared Calendars” and “Free/Busy” that is important when you wish to setup meetings or appointments with others. There is also no integrated services such as Live Meeting or SharePoint to further enhance the messaging and collaboration in the organization. Overall BPOS service – both individually and as a whole – give a much better cloud based offering for managing infrastructure than almost any other solution out there.  If you're sick and tired of mail outages, large attachments on email, high telephone costs, do take a look at Microsoft's Online Services. You might end up saving lot of money    **On cloud nine!**  **Yes, that is where cloud computing is set to take enterprises—both big and small**  BY DR MANOJ SAXENA  |  25 JANUARY 2010  **"Cloud computing brings in a new level of efficiency and economy to delivering IT resources on demand"**  **Cloud computing**, as a service offering, has been gaining momentum in India in the last couple of years. While big players such as Sun Microsystems, Google, IBM, Amazon and Microsoft are in the lead, many small private companies are beginning to grab market share.  The evolution of cloud computing will create not only a dynamic IT environment, but will also bolster user-empowerment through the concept of IT as a Service. A wide range of cloud computing platforms and applications are emerging in the market, offering businesses an entirely new way to deploy technology.  **The architecture** Before delving deeper into the criteria for adoption of the cloud computing model by enterprises, it is important to understand its architectural framework. While the majority of contemporary Internet applications use three-tier model as generic architecture, the use of virtualisation in clouds has created a new set of abstraction at higher levels—applications, platforms and infrastructure. These layers not only encapsulate on-demand resources but also define a new application development model. Within each layer of abstraction, there are myriad business opportunities for defining services that can be offered on a pay-per-use basis.  Software as a Service or SaaS occupies the highest layer and features a complete application offered as a service on-demand. Single instance of the software runs on a provider’s infrastructure and serves multiple clients. The middle layer, Platform as a Service or PaaS, offerings can provide for every phase of software development and testing, or they can be specialised around a particular area such as content management. Infrastructure as a Service or IaaS lies at the lowest rung. This layer can deliver basic storage and computing capabilities as standardised services over the network.  **Key attraction** Cloud computing has a tremendous enterprise pull because it conceals the complexity of the infrastructure from end-users. They do not know, or need to know, what is there in the cloud. This has become possible due to one of the key architectural attributes and underlying technologies of the cloud computing model—virtualisation. This refers to the abstraction of physical IT resources from the people and applications using them.  Virtualisation allows servers, storage devices and other hardware to be treated as a pool of resources rather than discrete systems so that these resources can be allocated on-demand.  Cloud computing brings a new level of efficiency and economy to delivering IT resources on demand, and in the process, it opens up new business models and market opportunities.  **Cost efficiency** As organisations cope with a dynamically changing business environment, IT managers can look to cloud computing as a way to maintain a flexible and scalable IT infrastructure that enables business agility. The IT managers are showing keen interest in investing time and understanding how the cloud will impact access control, network security and other core network components. IT managers of many organisations are also eyeing the cloud computing services model to save money.  The principal findings of a research conducted recently among IT managers of SMEs to study the acceptance of cloud computing by businesses has revealed that IT managers are aggressively deploying cloud computing initiatives to accomplish business objectives. As budgets for cloud computing increase, IT managers are examining critical technologies for building the infrastructure behind the cloud.  So how does an individual, a business or an IT manager take advantage of the cloud computing trend? Cloud computing is not just about proliferation of IT stacks on a restricted handful of infrastructure providers. It is also about an emerging ecosystem of complementary services that provide computing resources such as applications on demand, distributed databases and virtual private data centres for the entire range of IT consumers. These services span the range of customer requirements from individual developers and small startups to large enterprises. Not only the larger firms but also small and medium enterprises can leverage cloud computing to save costs.  **Boon for SMEs** Cloud computing provides an alternative to investing in one’s own infrastructure and software. Therefore, the ability to cloud-source an application instead of buying self- hosted applications has seen a significant rise amongst SMEs. Cloud computing presents a powerful opportunity to SMEs to use latest technologies and services from the cloud which also helps them save costs, as it is a pay-per-license model. It helps them to avoid buying the entire hardware or the software library.  Companies have realised that by clinging to the cloud they can access profitable business applications and can drastically boost their infrastructure resources, all at a negligible cost. This is forcing IT managers and CEOs of companies to deploy the cloud computing model in their organisations.  Keeping in view the array of advantages that cloud computing has to offer, the number and quality of public and commercially available cloud-based service offerings has been growing fast. Using the cloud is often the best option for start-ups, research projects, Web 2.0 developers, or niche players who want a simple and low-cost way to load and go.  A recent finding by global financial services firm Merrill Lynch suggests that cloud computing will expand into a global market of $95 billion over the next four years. Gartner has also named cloud computing, green IT and social-computing platforms among technologies that are poised to achieve broad enterprise adoption in the next two to five years.  This cloud is not one to be blown away in a hurry. |   Comments  You do not have permission to add comments. |

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