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AN ANALYSIS OF CLOUD COMPUTING

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ABSTRACT

Cloud computing is a shift from the traditional client/server architecture that reduces wastage and maximizes utilization, effectiveness and easy access to applications, resources and platforms. Cloud provides the concept of updating of resources without affecting the underlying infrastructure, which reduce the need of backup system and encourage the continuous execution of application. Cloud provides potential “Reliability” and “Scalability” for the applications either deployed or are running on cloud. Since, cloud use to assure out most security for any business application, it provides a “Private Cluster” for each application. Cloud computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet



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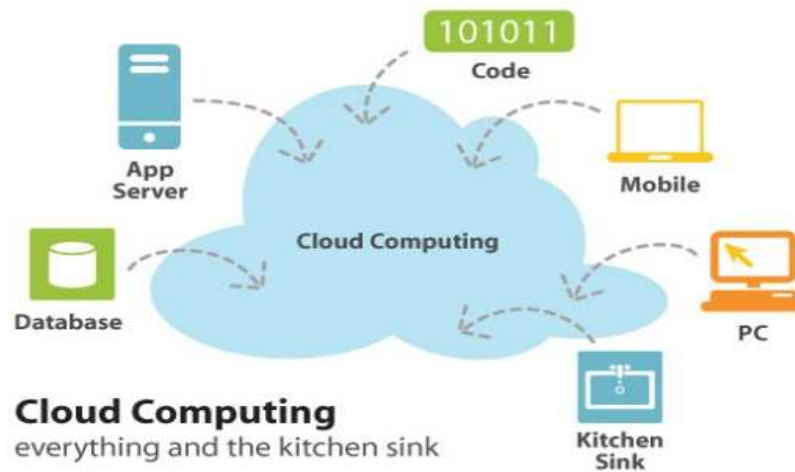
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access. This technology allows for much more efficient computing by centralizing storage, memory, processing and bandwidth.



Keywords

IaaS- Infrastructure as a Service

PaaS- Platform as a Service

SaaS- Software as a Service

TOM- Time of Market

TCO- Total Cost Ownership

ROI- Return On Investment

A simple example of cloud computing is Yahoo email or Gmail etc. You don't need software or a server to use them. All a consumer would need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud (internet) and is totally managed by the cloud service provider Yahoo , Google etc. The consumer gets to use the software alone and enjoy the benefits.



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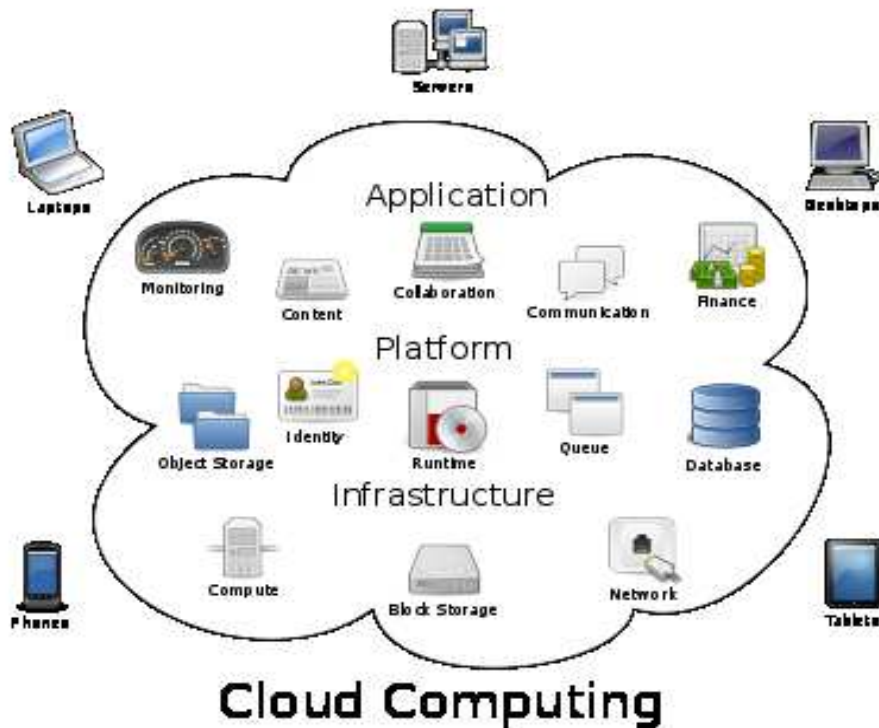
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Cloud computing is broken down into three segments: "**applications**," "**platforms**," and "**infrastructure**." Each segment serves a different purpose and offers different products for businesses and individuals around the world.



Cloud services:

SaaS : Software as a Service provides software applications as a service.

IaaS: Infrastructure as a Service is a service delivery model in which an organization is given control over applications and resources like storage, servers, hardware, components.

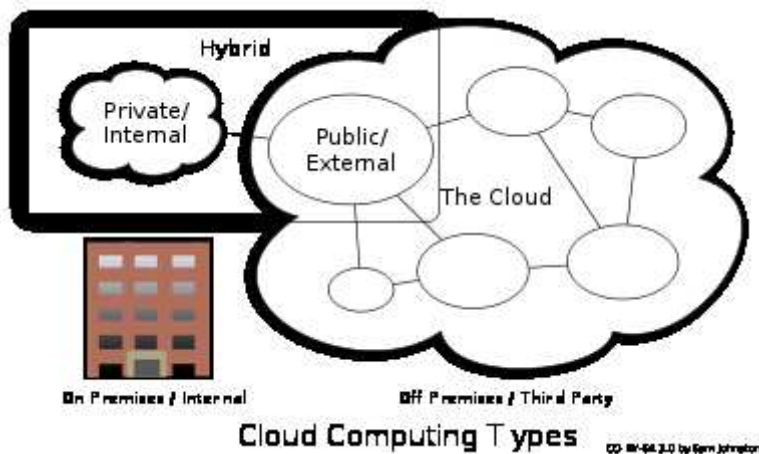


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PaaS: Platform as a Service is a set of software and product development tool that allows building applications on the providers' platform.

Cloud Computing Deployment Models



Public cloud

Public cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned to the general public on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who bills on a fine-grained utility computing basis.

Latest Features-

- Large scale infrastructure available on a rental basis
 - Operating System virtualization (e.g. Xen) provides CPU isolation
 - “Roll-your-own” network provisioning provides network isolation
 - Locally specific storage abstractions



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- Fully customer self-service
 - Service Level Agreements (SLAs) are advertised
 - Requests are accepted and resources granted via web services
 - Customers access resources remotely via the Internet
- Accountability is e-commerce based
 - Web-based transaction
 - “Pay-as-you-go” and flat-rate subscription
 - Customer service, refunds, etc.
- Many of the advantages offered by Public Clouds appear useful for “on premise” IT
 - Self-service provisioning
 - Legacy support
 - Flexible resource allocation
- What extensions or modifications are required to support a wider variety of services and applications?
 - Data assimilation
 - Multiplayer gaming
 - Mobile devices

Community cloud

Community cloud shares infrastructure between several organizations from a specific community with common concerns (security, compliance, jurisdiction, etc.), whether managed internally or by a third-party and hosted internally or externally. The costs are spread over fewer users than a public cloud (but more than a private cloud), so only some of the benefits of cloud computing are realized.



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Hybrid cloud

Hybrid cloud is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together, offering the benefits of multiple deployment models

Private cloud

Private cloud is infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally.

Cloud- As basic Business Scenarios:

Suppose, a business unit of an enterprise requires to deploy an application which will do the critical "Business Analysis considering some factors of current Market". This application need to be deployed with in a week time but to deploy this using the resource of organization will take a lots of time because to follow some of the cyclic processes. In this scenarios the "Cloud Computing" mainly the part called "Infrastructure as a Service" is very useful to make the things done with minimal expenses. This not only reduce the cost of deployment, but also reduce the timeframe to task done, platform independent, security, scalability, ongoing enhancement facilities etc. In one word "Cloud" opened multiple ways for upcoming business facilities. A research shows by implementing "Cloud based Solution or deployment" approaches" the 73% of company able to reach their "Time of Market(TOM)" for particular application and "Total Cost Ownership(TCO)" of services was showing low rate then "On-Premise" services with a fair "Return on Investment(ROI)".

Benefits

- Lower infrastructure cost-
 - Pay as you go or services used.
- Optimum utilization



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- It reduces wastage, improves resource utilization and cuts down the downtime.
- Simple
 - Transparent => need to “see” into the cloud
 - Scalable => complexity often limits scalability
- Extensible
 - New application classes and service classes may require new features
 - Clouds are new => need to extend while retaining useful features
- Commodity-based
 - Must leverage extensive catalog of open source software offerings
 - New, unstable, and unsupported infrastructure design is a barrier to uptake, experimentation, and adoption
- Easy
 - To install => system administration time is expensive
 - To maintain => system administration time is really expensive
- Extensibility
 - Simple architecture and open internal APIs
- Client-side interface
 - Amazon’s AWS interface and functionality (familiar and testable)
- Networking
 - Virtual private network per cloud
 - Must function as an overlay => cannot supplant local networking
- Security
 - Must be compatible with local security policies
- Packaging, installation, maintenance
 - system administration staff is an important constituency for uptake



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Cloud Computing Concerns

- Private Eyes Are Watching You

-There is a few standard hacker tricks that could cause cloud computing companies' major headaches. One of those is called key logging. A key logging program records keystrokes. If a hacker manages successfully to load a key logging program on a victim's computer, he or she can study the keystrokes to discover user names and passwords. Of course, if the user's computer is just a streamlined terminal, it might be impossible to install the program in the first place.

- Security

- The idea of handing over important data to another company worries some people. Corporate executives might hesitate to take advantage of a cloud computing system because they can't keep their company's information under lock and key.

- Privacy

-is another matter. If a client can log in from any location to access data and applications, it's possible the client's privacy could be compromised. Cloud computing companies will need to find ways to protect client privacy. One way is to use authentication techniques such as user names and passwords. Another is to employ an authorization format -- each user can access only the data and applications relevant to his or her job.

As we all know about cloud computing nowadays and also the importance of this in future. Still I will start with this technology as this will help to understand the latest technology called "Cloud Printing", cloud computing is nothing but a location-independent type of computing, where the different shared servers provide lots of resources, software and data to all the computers attached and other devices on demand.



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Cloud Print:

Now let's understand the concept of cloud printing, this is a type of services which allows the enterprises/organizations and individuals to print only what they need, and where they need it – saving the cost of shipping materials around the globe. Cloud print services are an accessible and smart way for enterprises/individuals to deliver commercial printing to their global network or employees, business partners and customers. Giants like Google, HP, etc have their own approaches on Cloud Print and they have already started to investigate on this and implemented as well.

Google's Cloud Print:

Imagine printing an important document from your Smart phone on the way to work and finding the printout waiting for you when you enter the office. This can be done by connecting your printer with the Google Cloud; you will be able to print to your printer from any computer or smart phone, regardless of where you are. Activate the Google Cloud Print connector in Google Chrome and your printer will automatically be available to you from Google Cloud Print enabled web and mobile apps. Android, iOS or other phone platforms which are HTML5-capable can print common documents coming from Gmail or from Google Docs to the printer which is associated with an account at Google.

Service Interface:

Google Cloud Print service interface that are used by a cloud print proxy. This proxy is a piece of software that enables any printer to register itself with Google Cloud Print, a web service for printing. Once the printer is registered with the service, it can then receive jobs from and communicate status with Google Cloud Print. Use of Google Cloud Print enables platform and format independent printing.



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Clouds Versus Grids

- Rich's assertion: Clouds and Grids are distinct
- Cloud
 - Full private cluster is provisioned
 - Individual user can only get a tiny fraction of the total resource pool
 - No support for cloud federation except through the client interface
 - Opaque with respect to resources
- Grid
 - Built so that individual users can get most, if not all of the resources in a single request
 - Middleware approach takes federation as a first principle
 - Resources are exposed, often as bare metal
- These differences mandate different architectures for each

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