ON PREMISE CLOUD COMPUTING AND ITS APPLICATION IN IMAGE PROCESSING

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Abstract-
Forward-thinking enterprises are using the cloud within their private data centers to take advantage of the best practices that public clouds have established, namely scalability, agility, automation, and resource sharing. Creating these private clouds enable IT departments to focus on innovation for the business, reducing both capital and operational costs and automating the management of complex technologies.

Cloud computing is an internet-based computing, whereby shared resources, software applications ,processing power, information, data are provided to computers and other devices on demand on the internet. There are three forms of cloud computing-public, private and hybrid. We will be developing a private cloud which is more secure than public and hybrid cloud. A private cloud is a cloud computing infrastructure created by an organization for its own internal use, rather than using someone else's infrastructure.

Keywords-
Cloud Computing, image processing, cloud security.

INTRODUCTION

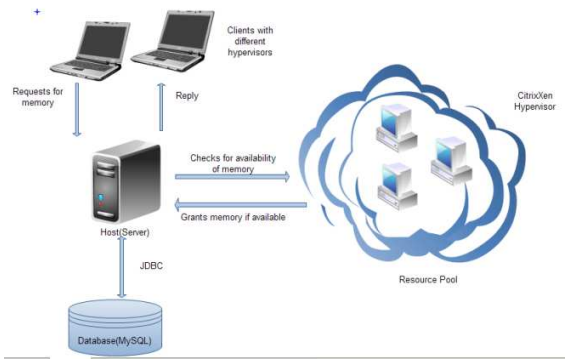
Cloud computing has become an area of very active research. With many new publications and conferences this year, the interest is very high. Because of this fact, definitions concerning *cloud computing* and what exactly cloud computing actually is differ.

Cloud computing is a means of accessing computer facilities via the Internet, where the adjective "cloud" reflects the diagrammatic use of a cloud as a metaphor for the Internet.

Most of us have been using cloud-computing facilities in one form or another for years through ordinary email and the World Wide Web. Recently, the term has come to reflect the use of software and the running of computer applications via the Internet where the computer infrastructure and software are not "on premises." Cloud computing, as a form of service provisioning, has given rise to several related concepts, such as mesh computing, cloud platforms, and software plus service.

A proper, but not necessarily definitive, conceptualization of cloud computing is to use office-class applications via your web browser over the Internet instead of having those applications reside on your "on premises" computer. In this instance, the service provider supplies the network access, security, application software, and data storage from a data center located somewhere on the Internet and implemented as a form of server farm with the requisite infrastructure.

A service would have ubiquitous access through a web browser. In general, the cloud computing concept is not limited to single-function applications, such as those available with typical office suites, but could include comprehensive enterprise applications pieced together from components residing in varying Internet locations.



CLOUD SERVICE CHARACTERISTICS

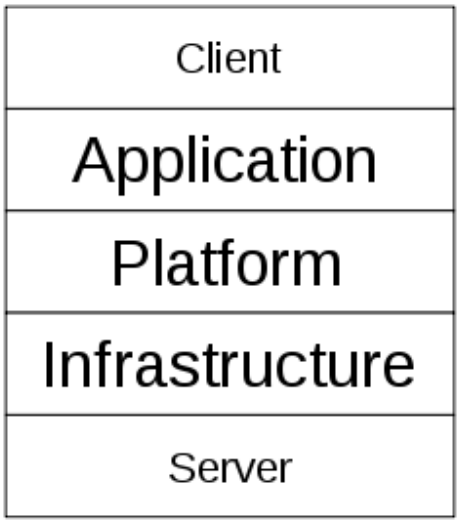
Cloud service utilities are characterized by four key factors: necessity, reliability, usability, and scalability. *Necessity* refers to the idea that a preponderance of users depend on the utility to satisfy everyday needs. *Reliability* refers to the expectation that the utility will be available when the user requires it. *Usability* refers to the requirement that the utility is easy and convenient to use – regardless of the complexity of the underlying infrastructure. *Scalability* refers to the fact that the utility has sufficient capacity to allow the users to experience the benefits of an expandable utility that provides economy of scale. Certainly, modern Internet facilities for search operations that engage thousands of servers satisfy these characteristics.

The notion of "paying for what one uses" is a compelling argument for using the cloud for special or all computing needs. The proof of the pudding may be in the details. The key question is whether the service should be based on a metered model or a subscription model. With the *metered model*, the usage is easily measured, monitored, and verified and lends itself to managerial control on the part of the user. In addition, metering can be applied to differing levels of service. With the *subscription model*, usage is difficult to control and monitor and its adoption is favored by managers more concerned with convenience than with resource control.

The difference between application services and multi-tenant services may very well be the deciding factor in determining whether metered or subscriber service is the way to go. With *multi-tenant service*, several clients may share the same software with separate data – as in the case of office processing. With *application service*, the service provider supplies one instance of the software per client, thereby lending itself to a form of metered service. In the latter case, the notion of a client should be regarded as an environment comprised of several users.

LAYERS OF CLOUD

Once an internet protocol connection is established among several computers, it is possible to share services within any one of the following layers.



1.**Client**

Client layer consists of computer hardware or software that relies on cloud computing for application delivery.

Examples include some computers, phones and other devices, operating systems.

2.**Application**

Cloud application services or "Software as a service (SaaS)" deliver software as a service over the Internet, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support.

Platform

Platform services, also known as "platform as a service", deliver a computing platform and/or solution stack as a service, often consuming cloud infrastructure and sustaining cloud applications. It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers.

Infrastructure

Cloud infrastructure services, also known as "infrastructure as a service" (IaaS), deliver computer infrastructure – typically a platform virtualization environment – as a service, along with raw (block) storage and networking. Rather than purchasing servers, software, data-center space or network equipment, clients instead buy those resources as a fully outsourced service.

Server

The servers layer consists of computer hardware and/or computer software products that are specifically designed for the delivery of cloud services, including multi-core processors, cloud-specific operating systems and combined offerings.

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.

Community cloud

Community cloud shares infrastructure between several organizations from a specific community with common concerns, whether managed internally or by a third-party and hosted internally or externally.

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.
They have attracted criticism because users still have to buy, build, and manage them and thus do not benefit from lower up-front capital costs and less hands-on management.

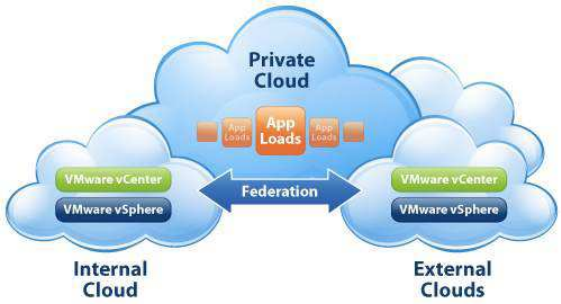


Image Processing

An **image processing** operation typically defines a new image *g* in terms of an existing image *f*.

The simplest operations are those that transform
each pixel in isolation. These pixel-to-pixel operations can be written:

Examples: threshold, RGB to grayscale

Algorithms:

Gray scaling

In computing, grayscale or **grayscale** digital image is an image in which the value of each pixel is a single sample. Displayed images of this sort are typically composed of shades of gray, varying from black at the weakest intensity to white at the strongest, though in principle the samples could be displayed as shades of any color, or even coded with various colors for different intensities. Grayscale images are distinct from black-and-white images, grayscale images have many shades of gray in between The term **monochromatic** in some digital imaging contexts is synonymous with grayscale, and in some contexts synonymous with black-and-white.

Gaussian Blur

Gaussian blur is a widely used effect in graphics software. It is typically used to reduce image noise and reduce detail levels. The visual effect of this blurring technique is a smooth blur resembling that of viewing the image through a translucent screen. Gaussian smoothing is also used as a pre-processing stage in computer vision algorithms in order to enhance image structures at different scales—see scale-space representation and scale-space implementation.

Mathematically speaking, applying a Gaussian blur to an image is the same as convolving the image with a distribution. Since the Fourier transform of a Gaussian is another Gaussian, applying a Gaussian blur has the effect of low pass filtering the image.

Mean Filter:

The idea of mean filtering is simply to replace each pixel value in an image with the mean (`average') value of its neighbors, including itself. This has the effect of eliminating pixel values which are unrepresentative of their surroundings. Mean filtering is usually thought of as a convolution filter.

Like other convolutions it is based around a kernel, which represents the shape and size of the neighborhood to be sampled when calculating the mean.

Median filters

The median filter is normally used to reduce noise in an image, somewhat like the mean filter. However, it often does a better job than the mean filter of preserving useful detail in the image.

Like the mean filter, the median filter considers each pixel in the image in turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. Instead of simply replacing the pixel value with the *mean* of neighboring pixel values, it replaces it with the *median* of those values. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order and then replacing the pixel being considered with the middle pixel value.

CONCLUSION

Major concern in cloud computing implementation is the security and reliability of this paradigm in satisfying stringent requirements. Efforts have been made by several parties aiming at providing private

cloud environment that can cope with such requirements while at the same time provides integration with public cloud so that mission critical compute tasks and process can still be conducted internally while keeping the possibility to scale computation of complex yet less mission critical processes and computation on-demand by using public cloud infrastructure. However, the technology has yet to become mature. Enterprises and private institutions may start looking at this alternative but it is recommended to stay for a while with legacy system for handling company's sensitive data and mission critical tasks.

With this new technology we are going to implement Image Processing which is a challenge for us.

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