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Cloud Computing

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Abstract— "CLOUD COMPUTING" is one of the emerging research area that is been used effectively at the industry level. One of the major contribution of cloud computing is to avail all the resources at one place in the form a cluster and to perform the resource allocation based on request performed by different users. We will define the user request in the form of requirement query. Cloud Computing devices being able to exchange data such as text files as well as business information with the help of internet. Technically, it is completely distinct from an infrared. Using a new super-sensitive optical sensor(SSOS) .The transmission and storage of large amounts of information, and become propulsion of fiber-optic accelerating towards 40G/100G. Its foreground is to provide secure, quick, convenient data storage and net computing service centered by internet. In this paper we consider about cloud computing, its working, its architecture, principle ,different applications and future development of cloud computing.

Keywords— Cloud Computing,SSOS,Resource scheduling,Cluster.

I. INTRODUCTION

Cloud computing is the delivery of computing services over the Internet. Cloud services allow individuals and businesses to use software and hardware that are managed by third parties at remote locations. Examples of cloud services include online file storage, social networking sites, webmail, and online business applications. The cloud computing model allows access to information and computer resources from anywhere that a network connection is available. Cloud computing provides a shared pool of resources, including data storage space, networks, computer processing power, and specialized corporate and user applications.

When you store your photos online instead of on your home computer, or use webmail or a social networking site, you are using a "cloud computing" service. If you are an organization, and you want to use, for example, an online invoicing service instead of updating the in-house one you have been using for many years, that online invoicing service is a "cloud computing" service. Instead of keeping data on your own hard drive or updating applications for your needs, you use a service over the Internet, at another location, to store your information or use its applications.

A. Two components of cloud computing are

1) Infrastructure as a Service (IaaS).
2) Platform as a Service (PaaS).

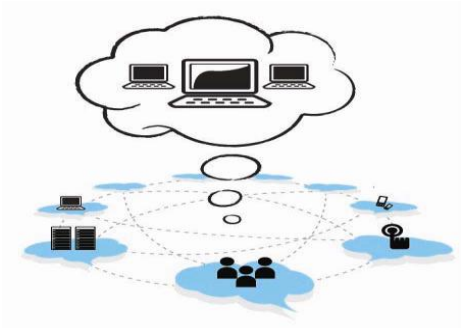


Fig. 1

II. HOW CLOUD COMPUTING WORKS?

Let's say you're an executive at a large corporation. Your particular responsibilities include making sure that all of your employees have the right hardware and software they need to do their jobs. Buying computers for everyone isn't enough -- you also have to purchase software or software licenses to give employees the tools they require. Soon, there may be an

alternative for executives like you. Instead of installing a suite of software for each computer, you'd only have to load one application. That application would allow workers to log into a Web-based service which hosts all the programs the user would need for his or her job. Remote machines owned by another company would run everything from e-mail to word processing to complex data analysis programs. It's called **cloud computing**, and it could change the entire computer industry. In a cloud computing system, there's a significant workload shift. Local computers no longer have to do all the heavy lifting when it comes to running applications. The network of computers that make up the cloud handles them instead. Hardware and software demands on the user's side decrease. The only thing the user's computer needs to be able to run is the cloud computing system's interface software, which can be as simple as a Web browser, and the cloud's network takes care of the rest. If you have an e-mail account with a Web-based e-mail service like Hotmail, Yahoo! Mail or Gmail, then you've had some experience with cloud computing. Instead of running an e-mail program on your computer, you log in to a Web e-mail account remotely. The software and storage for your account doesn't exist on your computer -- it's on the service's computer cloud.

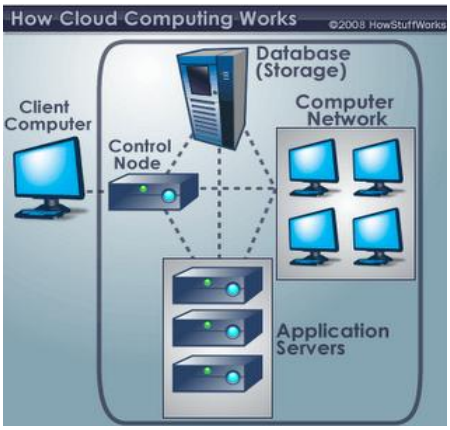


Fig. 2 How Cloud Computing Work

III. TRANSMISSION STEPS

A. Audit operational and business processes
B. Manage people, roles and identities
C. Ensure proper protection of data and information
D. Enforce privacy policies
E. Assess the security provisions for cloud applications
F. Ensure cloud networks and connections are secure
G. Evaluate security controls on physical infrastructure and facilities
H. Manage security terms in the cloud SLA
I. Understand the security requirements other exit process

IV. CLOUD COMPUTING TRANSCEIVER

The block diagram of a Cloud Computing Transceiver shown in Fig 3

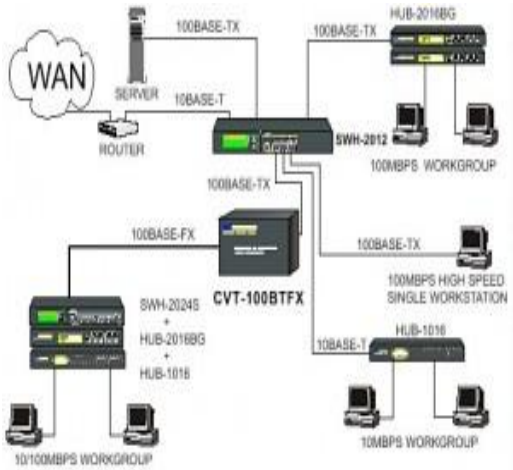


Fig. 3 The block diagram of a Cloud Computing Transceiver

With cloud computing go deep into everyday life, the demand of the expansion of the data center soars, caused the fiber optic network market bullish, and motivate the industry to develop the whole laser diode (Laser Diode) and Light Emitting Diode (Photo Diode) silicon optical bench (SiOB) duplex optical subassembly (BOSA),so as to reduce the cost of the components. Wei Hongyi, founder and vice chairman of the heritage photoelectric, said cloud services will stimulate fiber broadband market to flourish, using a fiber-optic link between the server and the server is imperative to meet the needs of the transmission and storage of large amounts of information, and become propulsion of fiber-optic accelerating towards 40G/100G. Optical transceivers value rises in the wake of this huge fiber optic network demand catalytic.

V. Cloud Computing Architecture

When talking about a cloud computing system, it's helpful to divide it into two sections: the front end and the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system.

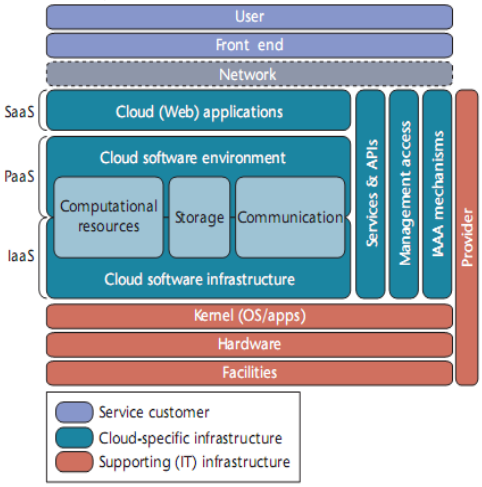


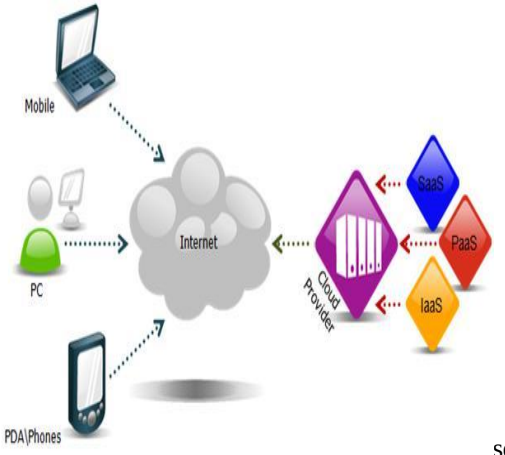
Fig. 4 Cloud Computing Architecture

The front end includes the client's computer (or computer network) and the application required to access the cloud computing system. Not all cloud computing systems have the same user interface. Services like Web-based e-mail programs leverage existing Web browsers like Internet Explorer or Firefox. Other systems have unique applications that provide network access to clients.

On the back end of the system are the various computers, servers and data storage systems that create the "cloud" of computing services Usually, each application will have its own dedicated server..

A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols and uses a special kind of software called middleware. Middleware allows networked computers to communicate with each other.

VI. FEATURES OF CLOUD COMPUTING



Cloud Computing has five es sential features that are :-

Fig. 5 Features Of Cloud Computing

A. Rapid Elasticity

Cloud computing has the ability of scaling the resources both ways as per the need and for the consumers, cloud is infinite and one can buy the computing power as per the need.

B. Measured service

In this feature, the aspects of cloud service are monitored as well as controlled by the service provider. This helps in billing, resource optimization, access control and capacity planning.

C. On demand self service

This feature enables the consumer in using the services as and when required without any interaction with the provider

D Everywhere network access

In this feature, the capabilities of the service provider are available over the internet and it can be accessed by using the standard mechanism by any type of client.

E. Resource pooling

This feature allows the service provider to provide its services through a multi tenant model. Resources, both virtual as well as physical, are assigned or reassigned as per the demands of the consumer.

VII. PRINCIPLES AND STRENGTHS OF THE TECHNOLOGY

A. Dynamic computing infrastructure

Cloud computing requires a dynamic computing infrastructure. The foundation for the dynamic infrastructure is a standardized, scalable, and secure physical infrastructure. There should be levels of redundancy to ensure high levels of availability, but mostly it must be easy to extend as usage growth demands it, without requiring architecture rework. Finally, this infrastructure should be highly utilized, whether provided by an external cloud provider or an internal IT department.

B. IT service-centric approach

Cloud computing is IT (or business) service-centric. In most cases, users of the cloud generally want to run some business service or application for a specific, timely purpose; they don't want to get bogged down in the system and network administration of the environment. They would prefer to quickly and easily access a dedicated instance of an application or service. By abstracting away the server-centric view of the infrastructure, system users can easily access powerful pre-defined computing environments designed specifically around their service.

C. Self-service based usage model

Best of breed self-service provides users the ability to upload, build, deploy, schedule, manage, and report on their business services on demand. Self-service cloud offerings must provide easy-to-use, intuitive user interfaces that equip users to productively manage the service delivery lifecycle. One benefit often overlooked from the service provider's or IT team's perspective is that the more self service that can be delegated to users, the less administrative involvement is necessary. This saves time and money and allows administrative staff to focus on more strategic, high-valued responsibilities.

D. Minimally or self-managed platform

In order for an IT team or a service provider to efficiently provide a cloud for its constituents, they must leverage a technology platform that is self managed. Best-of-breed clouds enable self-management via software automation, leveraging the following capabilities:

1) A provisioning engine for deploying services and tearing them down recovering resources for high levels of reuse.
2) Mechanisms for scheduling and reserving resource capacity.
3) Capabilities for configuring, managing, and reporting to ensure resources can be allocated and reallocated to multiple groups of users.

This balance of control and delegation maintains security and uptime, minimizes the level of IT administrative effort, and keeps operating expenses low, freeing up resources to focus on higher value projects.

E. Consumption-based billing

Finally, cloud computing is usage-driven. Consumers pay for only what resources they use and therefore are charged or billed on a consumption-based model.

The value here from a user's perspective is the ability for them to pay only for the resources they use, ultimately helping them keep their costs down. From a provider's perspective, it allows them to track usage for charge back and billing purposes.

STRENGTHS

A. Centrally-controlled but distributed components

You want to configure your solution in many different ways, but there has to be a central hub that controls all of it. One of the most common mistakes companies make is to either have cloud solutions that are too tight in terms of distribution, or that lack central control. Striking the balance between the two is essential.

B. Use virtualization as a tool, not a requirement

Virtualization is a technology that enables the cloud; it's not a necessary component. Cloud solutions don't always mean virtualization. Use virtualization when it makes sense for what you're doing, not simply because you can.

C. Build security and governance into your cloud system:- These are issues that must be addressed in your cloud design, and whose capabilities have to be inherent from design through deployment.

D. Power-management flexibility

If hardware fails, the load can automatically be deployed elsewhere. Likewise, in theory, you could move all virtual loads to certain servers when loads are light and power-down or idle those that aren't being used.

E. You can pick the most efficient site possible

So, for example, if you are a business based in a state that uses primarily coal-powered electricity, do you really want to site your data center there? "If you have a data center in a place that is all coal-powered, this is a big business risk," Koo may says. In a future where there might actually be a tax on the carbon your company produces, that would certainly be a risk indeed.

F. Almost Unlimited Storage

Storing information in the cloud gives you almost unlimited storage capacity. Hence, you no more need to worry about running out of storage space or increasing your current storage space availability.

G. Backup and Recovery

Since all your data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device. Furthermore, most cloud service providers are usually competent enough to handle recovery of information. Hence, this makes the entire process of backup and recovery much simpler than other traditional methods of data storage.

VIII. APPLICATIONS OF CLOUD COMPUTING

There are many applications of Colud Computing in different fields.

A. Media + entertainment

Cloud has made media and entertainment a fundamentally engrained, pervasive part of our daily experience and it's shaping new generations of users who expect rich content on demand from the cloud to whatever device they're using whether it's their iPad via iCloud/iTunes or their TV via Roku and Netflix or their Mobile Phone via Spotify.

B. Social/collaboration

The Social & Collaboration cloud formation is enabling applications that enrich supply and demand chain relationships, improve customer intimacy and loyalty, enable collaborative, crowdsourced product design and development which draws us ever closer to the markets we serve.

C. Mobile/location

Certainly an ecosystem of cloud-delivered services in the form of content, applications, apps, video and games contributes to smart phones.

This mobile and location cloud formation means that wherever we are, the need we have in that moment can be targeted to our location and situation.

D. E-commerce/payments

Mobile commerce occurs when location-based offers are served up at the point of need. This type of "situational commerce" takes target segmentation to new levels of specificity.

The payments cloud is forming more slowly as the politics of control between merchants, banks and consumers is not an easy one to resolve.

F. *Big data/analytics*

Everything we've discussed generates and relies upon massive volumes of so called "Big Data" like profile and behavioral data, which needs to be stored, managed and analyzed on demand. With that said then, it's no wonder that this year's survey points to Big Data as the software category most open to disruption by the cloud.

G. *Google Groups*

Google Groups is a service from Google that supports discussion groups … based on common interests. Membership in Google Groups is free of charge and many groups are anonymous. Users can find discussion groups related to their interests and participate in threaded conversations, either through a web interface or by email.

H. *Dropbox*

Dropbox is a web-based file hosting service … which uses cloud computing to enable users to store and share files and folders with others across the internet using file synchronization. There are both free and paid services, each with varying options.

I. *Basecamp*

Basecamp is a web-based project management tool launched in 2004. Basecamp primary features are to-do lists, milestone management, forum-like messaging, file sharing, and time tracking. Basecamp has four different plans available starting at $24 per month right up to $149 per month and all accounts have a 30 day free trial.

J. *Backpack*

Backpack is a web-based personal information manager and intranet for small business. The application has two main functions: user-created pages (which can include text, images and files) and an iCalendar format calendar. Features of the user-created pages include to-do lists, inline photo galleries, notes and file attachments, and page sharing.

K. Campfire

Campfire is a business-oriented online chat service. To use the application, users must either create a new chat room or be

invited to one. Unless a chat room is specifically chosen to be "off the record", browsable transcripts of chats and uploaded files are stored for future reference. - Wikipedia.

L. PayCycle

PayCycle Inc. is an online payroll service started in 1999 by Rene Lacerte and Martin Gates. [It] was the first company to introduce a completely internet-based payroll service. - Wikipedia.

PayCycle isn't free but has a free trial for 30 days and then the first two months after that are just $9.99 each.

IX. FUTURE DEVELOPMENT

There's no doubt that advances in cloud computing technology are revolutionising the way that businesses run, across all industries. In fact, Gartner recently predicted that the public cloud services market is forecast to have grown by 19.6% in 2012 to a total $109 billion worldwide.

Looking ahead to 2013, we are going to see more and more organisations seeking alternatives to on-premise deployments. As such, cloud adoption will increase dramatically; and when moving to the cloud, businesses will need to think carefully about how they will ensure that cloud providers can meet promised service-level agreements (SLAs).

Cloud security has been a big talking point this year, and increasing concerns about security and management in2013 will mark the move to private clouds for B2B interaction management and governance.

With an increasingly complex IT environment on the horizon for IT departments, it will be important to look further ahead than just 2013. By 2015, IT teams will need to have honed new skills that enable them to:

- Work with different types of providers
- Enforce a host of widely disparate SLAs
- Evaluate varying levels of performance
- Prepare for different disaster-recovery scenarios
- Implement a variety of support and escalation processes
- Accommodate different subscription and billing models (whether transaction- or API-based).

X. CONCLUSIONS

The performance of Cloud Computing is better as compared to other technologies. This is the platform roadmap I personally see from what is happening currently in the market and technology. This will be a gold mine for platform companies such as Google, Microsoft and Apple, who can retain their customers in selling devices for their platforms. However, there needs a technology and customer perspective shift to bring this to life. This could get as simple as two people equipped with Cloud Computing devices being able to exchange data such as text files as well as business information with the help of internet. The presented work will give the advantages in terms of better resource allocation and to achieve the higher degree of user satisfaction.

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