Cloud Computing Infrastructure in NIC Assam

Cloud computing is simply a set of pooled computing resources and services delivered over the web. When you diagram the relationships between all the elements it resembles a cloud. Cloud computing-not to be confused with grid computing, utility computing, or autonomic computing-involves the interaction of several virtualized resources. Cloud Servers connect and share information based on the level of website traffic across the entire network.

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CLOUD computing is often provided "as a service" over the Internet, typically in the form of Infrastructure as a Service (IaaS), Platform as a Service (PaaS), or Software as a Service (SaaS). Instead of having to invest time and money to keep their sites afloat, cloud computing customers simply pay for the resources they use, as they use them. This particular characteristic of cloud computing-its elasticity-means that customers no longer need to predict traffic, but can promote their sites aggressively and spontaneously.

Lets us take an example:
Let's consider us in NIC which is a large organization. In NIC, the responsibilities with higher officials include making sure that all of our employees have the right hardware and software they need to do their jobs. Let's say buying computers for everyone isn't enough -- we also have to purchase software or software licenses to give employees the tools they require. Whenever we have a new hire, we have to buy more software or make sure our current software license allows another user. It's so stressful that we find it difficult to go with so much of expenditure. Soon, there may be an alternative for people like us. Instead of installing a suite of software for each computer, we 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/organization would run everything from email to word processing to complex data analysis programs. It's called cloud computing, and it could change the entire computer industry.

CLOUD ARCHITECTURE

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.

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.

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. In theory, a cloud computing system could

include practically any computer program you can imagine, from data processing to video games.

IMPLEMENTATION OF PRIVATE CLOUD IN NIC ASSAM STATE CENTER USING EUCALYPTUS

Recently we have successfully implemented EUCALYPTUS for creation of a private cloud in NIC Assam. So far we have deployed an intranet portal on DRUPAL in one of the VM instances (http://intranet.assam.nic.in) and another instances for various application testing by the DIOs in the districts on RHEL5.0 with JBOSS application server. This instances (Node Controller) are running on a DELL Blade server with 16 GB RAM and 146*2 GB Hard disks. This was in fact possible with the very helpful guidance provided bySh C S R Prabhu, DDG and his team from NIC Hyderabad. In Eucalyptus, there are NC (Node Controller), CC (Cluster Controllers) and CLC (Cloud Controller), WALRUS, SC (Storage controller). The physical architecture can be on a single system but logically they can be n-tier. In NIC Assam, we have CLC and CC, Walrus and SC in one front end system and in the back end we have a NC where the hypervisor engines runs for various instances. But from the user end, one has to only access the eucalyptus frontend with the help of the browser like: http://frontend system ip: port. So it means the user can connect to the CC front end with the help of the specific url and then the user has to create an image and then the image needs to be uploaded to the CC.

After that user can run the instances at their own wish.

NOTE: this is for the first time to create and run the VM instance without any password. After doing this and you are connected to the VM instances, you can give a root password to the instance. After doing that , you can connect to this VM instance from any system with ssh/putty...

FEW SUCCESS STORIES

Some of the example of successful implementation of cloud computing infrastructure are Amazon Web Services (http://aws.amazon.com) , Google Apps, Salesforce.com and Microsoft Windows Azure platform. AWS, Salesforce.com and Google Apps which provide common business applications online that are accessed from a web browser, while the software and data are stored on the servers. Salesforce.com is an easy-to-use Web-based CRM solution for sales, service, marketing, and call centre operations that streamlines customer relationship management and boosts customer satisfaction. Google Apps is a collection of Google applications and utilities such as Web-based e-mail, instant messaging, calendar, word processing and spreadsheets. Amazon's Simple Storage Service, for instance, offers unlimited and inexpensive online storage ($0.15 per gigabyte per month). AOL provides a service called Xdrive with a capacity of 50 gigabytes for $9.95 per month (the first five gigabytes are free). And Microsoft offers Windows Live SkyDrive, currently in beta, with a one-gigabyte free storage limit as apart of their cloud computing infrastructure as a Service (IAAS). Amazon web services uses EC2 (Elastic Compute Cloud) whereas Google uses Google App Engine to deliver these services. **But as a framework that is compatible with Amazon's EC2 and S3 interfaces, Eucalyptus can be used with many of the tools that have been developed for EC2 and S3**. In addition to the tools created and officially supported by the Eucalyptus Team, Euca2ools. The following Amazon EC2 command line tools are entirely compatible with Eucalyptus

ec2-api-tools-1.3-30349 (Count: 1058)

ec2-ami-tools-1.3-26357 (Count: 576)

MYTH ABOUT CLOUD COMPUTING

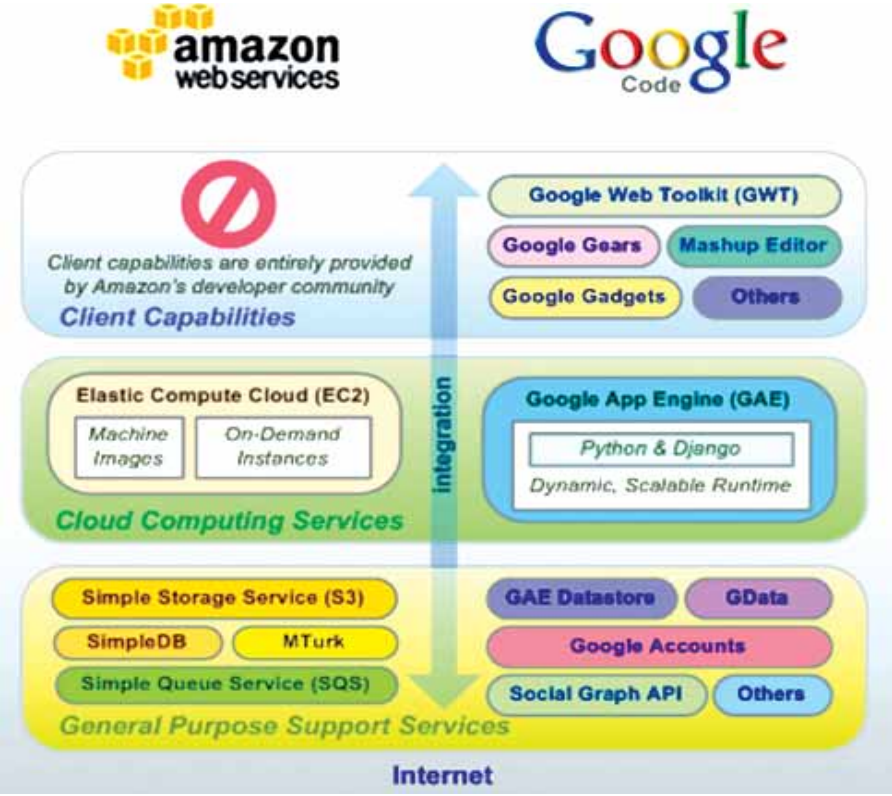
There are many myths about cloud computing but the most important one is about its security:

1. Is Cloud computing secure? Public clouds are fundamentally multi-tenant to justify the scale and economics of the cloud. As such, security is a common concern. Whereas the traditional security perimeter is a network firewall, the cloud security perimeter now becomes the hypervisor and/or underlying cloud application. So far, security in the cloud has been good, but this is very cloud-dependent and requires a solid design and operational rigor that prioritizes security. Also, handing your data and systems to someone else requires proper internal controls to ensure that not just anyone has access. One has to be sure to ask potential cloud computing providers about security from technical, operational, and control perspectives, as well as what experience they have being stewards of customer systems and data. If the public cloud is fundamentally not secure enough, one can always consider an on-premise cloud, virtual private cloud, or some sort of hybrid cloud solution that allows you to maintain the level of security you require.

2. Can we move everything to CLOUD computing? Not all applications are suitable for cloud computing. While the Cloud is here to stay, it will not replace traditional hosting or on-premise deployments, but rather complement them. There will always be situations where security requirements, flexibility, performance or control will preclude the cloud. In those cases, a hybrid solution involving both cloud and either traditionally hosted or on-premise servers may make sense.

Therefore what is the future of Cloud Computing? There's also the

Comparing Two of the Leading Software Platforms In The Cloud



Source: http://www.nilkanth.com/?s=saas

conspicuous issue of constant connectivity: a repository of online data isn't useful if there's no Internet connection to be had, or if the signal is spotty. It is a technical challenge of providing service to Web applications without interruption. A unified theory of cloud computing isn't as simple as writing software, however, there are a number of social and legal issues that need to be dealt with like Privacy of data. Moreover, there are copyright ramifications to cloud computing. So there are many issues with CLOUD computing. But certainly there are a number of ways of addressing it and we must try to find out solutions to all these to make CLOUD Computing a success in the near future.