Cloud Computing

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Abstract
Cloud computing is a paradigm shift in which computing is moved away from personal computers and even the individual enterprise application server to a 'cloud' of computers. A cloud is a virtualized server pool which can provide the different computing resources of their clients. Users of this system need only be concerned with the computing service being asked for. Cloud computing is the style of computing where massively scaled IT related capabilities are provided as a service across the internet to multiple external customers and are billed by consumption. Cloud Computing is finding use in various areas like web hosting, parallel batch processing, graphics rendering, financial modeling, web crawling, genomics analysis, etc.
Keywords: Cloud Computing, Promise of cloud computing, Enabling Technologies, cloud computing types.

Introduction

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

A simple example of cloud computing is Yahoo email, Gmail, or Hotmail etc. You dont need a 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. Cloud computing is broken down into three segments: "application" "storage" and "connectivity." Each segment serves a different purpose and offers different products for businesses and individuals around the world. In June 2011, a study conducted by Version One found that 91% of senior IT professionals actually don't know what cloud computing is and two-thirds of senior finance professionals are clear by the concept,[1] highlighting the young nature of the technology. In Sept 2011, an Aberdeen Group study found that disciplined companies achieved on average an 68% increase in their IT expense because cloud computing and only a 10% reduction in data center power costs.[2]

Promise of cloud computing: We have entered a new era in computing, one in which software running on users' own PCs and IT systems increasingly is complemented by applications and

services accessed over the Internet from remote datacenters, i.e., "the cloud." The potential benefits of cloud computing are enormous. They include greater efficiencies for organizations to customize and rapidly scale their IT systems for their particular needs, expanded access to computational capabilities previously available only to the very largest global companies, better collaboration through "anywhere, anytime" access to IT for users located around the world, and new opportunities for innovation as developers flock to this latest computing paradigm. For governments in particular, cloud computing offers the potential to reduce costs in a time of economic constraints while making data more easily accessible to citizens and making the process of governance more transparent.

Enabling Technologies

Cloud Computing Application Architecture

This gives the basic architecture of a cloud computing application.We know that cloud computing is the shift of computing to a host of hardware infrastructure that is distributed in the cloud. The commodity hardware infrastructure consists of the various low cost data servers that are connected to the system and provide their storage and processing and other computing resources to the application. Cloud computing involves running applications on virtual servers that are allocated on this distributed hardware infrastructure available in the cloud. Cloud computing involves running applications on virtual servers that are allocated on this distributed hardware infrastructure available in the cloud.
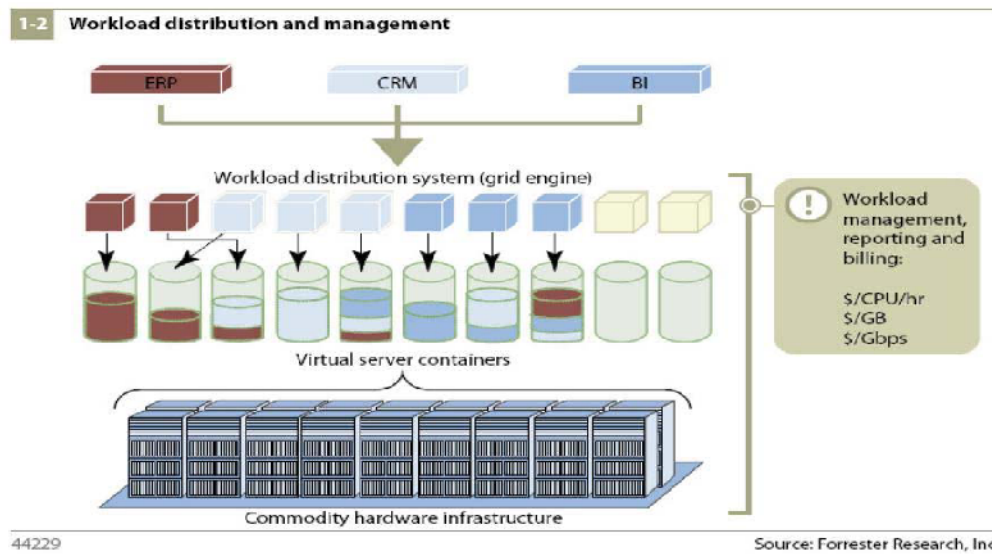
These virtual servers are made in such a way that the different service level agreements and reliability issues are met. There may be multiple instances of the same virtual server accessing the different parts of the hardware infrastructure available. This is to make sure that there are multiple copies of the applications which are ready to take over on another one's failure. The virtual server distributes the processing between the infrastructure and the computing is done and the result returned. There will be a workload distribution Cloud Computing Division of Computer Science and Engineering, School Of Engineering, CUSAT 9 management system, also known as the grid engine, for managing the different requests coming to the virtual servers. This engine will take care of the creation of multiple copies and also the preservation of integrity of the data that is stored in the infrastructure. This will also adjust itself such that even on heavier load, the processing is completed as per the requirements. The different workload management systems are hidden from the users. For the user, the processing is done and the result is obtained. There is no question of where it was done and how it was done. The users are billed based on the usage of the system - as said before - the commodity is now cycles and bytes. The billing is usually on the basis of usage per CPU per hour or GB data transfer per hour.

Cloud Computing Types

Public cloud

Public cloud applications, storage, and other resources are made available to the general public by a service provider. These services are free or offered on a pay-per-use model.

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 cost savings potential of cloud computing are realized.

Cloud Computing Types
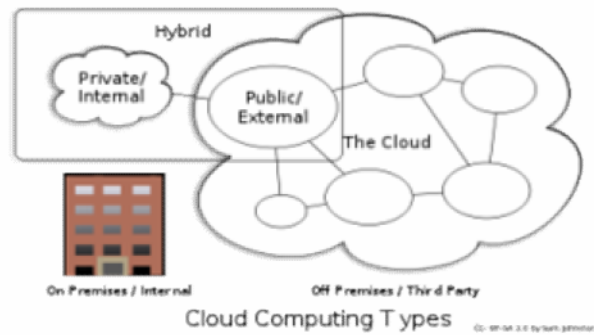
Private cloud

Private cloud is cloud 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 less hands-on management, essentially "[lacking] the economic model that makes cloud computing such an intriguing concept".

Conclusion

Cloud computing is a powerful new abstraction for large scale data processing systems which is scalable, reliable and available. In cloud computing, there are large self-managed server pools available which reduces the overhead and eliminates management headache. Cloud computing services can also grow and shrink according to need. Cloud computing is particularly valuable to small and medium businesses, where effective and affordable IT tools are critical to helping them become more productive without spending lots of money on in-house resources and technical equipment. Also it is a new emerging architecture needed to expand the Internet to become the computing platform of the future.

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