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Research Paper

Comparative Study of Grid and Cloud Computing

Computer science

KEYWORDS : Cloud computing, Grid computing, cluster computing.

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ABSTRACT

This paper explains the importance of cloud and grid in the computing. Often in all most all persons who were related to the field of computer technology that if cloud computing is actually something new and, if so, what exactly distinguishes this new paradigm from former computing models like cluster and grid computing. In grid computing where more than one computer coordinates to solve a problem together. Often used for problems involving a lot of number crunching, which can be easily parallelizable. Cloud computing is where an application doesn't access resources it requires directly, rather it accesses them through something like a service. As provided by the cloud computing like Software As Service, Infrastructure As Service and Platform As Service.

INTRODUCTION

In simple Grid Computing Works on Hardware part as located distributed over network that may be heterogeneous for solving big computational problems. A Grid is a hardware and software infrastructure that clusters and integrates high-end computers, networks, databases, and scientific instruments from multiple sources to form a virtual supercomputer on which users can work collaboratively within virtual organizations. Grids are used as computing/storage platform. Grid computing is a form of distributed computing where a virtual computing system is compiled by using many loosely connected computing devices to perform a large computing task. They are loosely connected because they can be from multiple administrative realms coupled to effectively combine computing resources to reach a general goal. The goal can typically be a single problem – usually a scientific of technical problem that requires a large amount of processing performed on a huge data set. Grid Computing supports the creation of Virtual Organizations where resource are shared by participants, which are also allowed to use them in a secure fashion (by means, for example, of single-sign-on and delegation mechanisms). Being part of the Virtual Organization should not be necessary, in theory, for accessing the resources, but in practice it always happen.

Grid systems are designed for collaborative sharing of resources. It can also be thought of as distributed and large-scale cluster computing. A Grid is basically the one that uses the processing capabilities of different computing units for processing a single task. The task is broken into multiple sub-tasks, each machine on a grid is assigned a task. As when the sub-tasks are completed they are sent back to the primary machine which takes care of the all the tasks. They are combined or clubbed together as an output.

Cloud computing refers to any computing services provided by hosted systems over the Internet. The service provided can be one of the infrastructure, platform or software services. The salient feature of cloud computing is that the service is fully managed by the service provider and the user needs minimum facilities like a personal computer and the Internet to utilize the service. Due to the fact that the service providers host the services, the services are presented to the users in a simple way where they are not needed to understand how the services are provided.

Cloud Computing separates more clearly the clients and the service providers. They do not participate in a Virtual Organization. They just create a contract, where the client specifies the desired services, the required quality of service (QoS) and the duration of the contract. The provider must respect the contract, by elastically adding (or removing) resources, when necessary.

Cloud is basically an extension to the object-oriented programming concept of abstraction. Here cloud means the Internet. For the end users it is just getting outputs for certain inputs, the complete process that lead to the outputs is purely invisible. Computing is based on virtualized resources which are placed over multiple servers in clusters. Also within the "cloud computing" family, are what's known as a SPI model SaaS, PaaS and IaaS. These are the services available on the cloud and do all the heavy lifting using someone else's infrastructure. Cloud computing eliminates the costs and complexity of buying, configuring, and managing the hardware and software needed to build and deploy applications; these applications are delivered as a service over the Internet (the cloud).

DIFFERENCE BETWEEN CLOUD AND GRID

Grid and Cloud are two terms used in computing to refer to two types of resource sharing techniques where multiple computing devices and usually the Internet are involved.

As far as application domains go, grids require users (developers mostly) to actually create services from low-level functions that grid offers. Cloud will offer complete blocks of functionality that you can use in your application. The below table shows some comparisions between grid computing and cloud computing.

Table 1:Comparision Grid and Clou Computing[1]

Parameter	Grid computing	Cloud Computing
Goal	Collabrative sharing of resources	Use of service (eliminates the detail)
Computational focuses	In one physical node	In EC2 instance (Amazon EC2+S3)
Degree of scalability	Normal	High
Time to run	Not real-time	Real-time services
Requests type	Few but large allocation	Lots of small allocation
Virtualization	Not a commodity	Vital
Security	Low (grid certificate service)	High (virtualization)
Ownership	Multiple	Single
Resource management	Distributed	Centeralized / distributed
Interoperability	Open grid forum standards	Web services (SOAP and REST)
Pricing of services	Dominated by public good or private assigned	Utility pricing discounted for larger customers
Example of real world	SETI, BOINC, Folding@home, GIMPS	Amazon Web Service(AWS), Google apps
Future	Cloud computing	Next generation of internet

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Here some are differences between grid and cloud computing. The below table illustrates the differences

Table 2. Grid and Cloud computing Differences

Grid	Cloud
Open standards	No standardized interfaces
Publicly funded & operated (slo evolution)	Privately funded & operated (fast evolution)
No central management	Managed by a single entity
Interoperaability important	No interoperability
Geographically distributed locally owned and managed	Geographically distribute; centrally owned and managed.
Share (usually modest) local resources	Make huge systems available
Scientific research, high end users	Information processing, data mining

QoS ASPECTS IN GRIDS AND CLOUDS

Table 2: Qos aspects in Grids and Clouds[2]

Aspect	Grid QoS	Cloud Qos
Servic Management	Pre-Installed services	Installation on demand
SLA attainment strategies	Request/response models	Self-adaptable models

CONCLUSION

This paper given some detailed overview of comparative study of Grid Computing and cloud computing. First concentrated on the introduction of Grid Computing and Cloud computing. Also explains what is Grid and Cloud next it given the comparision between grid and cloud with the illustrations from table and it is follows by another table showing the differences of grid and cloud computing. And finally it shown the table of Qos(Quality of Service) aspects in Grid and clouds.

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