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CLOUD AND GRID ANALOGY: HOW TO CORRELATE THEM BY PERFORMANCE

Tripti Sharma, Bhupesh Kumar Dewangan, Sanjay Kumar Baghel

Abstract*— T*he objective of this paper has a clear definition between cloud and grid computing according to their performance and also it is focusing on difference between them. Here the differences are calculated by processing time of both technologies, once database alumni_record is processed in cloud then same database is processed in grid computing, total time taken by both is measures and compared by result. The result that achieved in this paper has shown that grid is giving good performance comparatively cloud. The purpose of this paper is to provide a model to researchers and Cloud –Grid system administrator. It provides the knowledge that what cloud and grid computing is and how it is differ according to performance on execution time basic. Cloud computing is a large-scale distributed computing paradigm that is driven by economies of scale, in which a pool of abstracted, virtualized, dynamically scalable, managed computing power, storage, platforms, and services are delivered on demand to external customers over the Internet [10]. Where as Grid computing is a collection of heterogeneous computers and resources spread across multiple administrative domains with intend of providing users easy access to these resources [6].

***Index Terms*-- Cloud computing, Grid Computing, Performance-Execution Time**

I. INTRODUCTION

CLOUD COMPUTING AND ITS BENEFITS

Cloud computing is a style of computing where massively scalable IT-enabled capabilities are delivered 'as a service' to external customers using Internet technologies. The three key words in this definition are *scalable*, *service* and *Internet*. Cloud computing is about how an application is deployed and delivered over the Internet and which is scalable on demand. Cloud computing is not something that an end-user buys. In fact, end-users should be oblivious to, and shouldn't care, whether an application is delivered using cloud computing. Cloud computing is a deployment model for applications that is used by organizations in order to reduce infrastructure costs and/or address capacity/scalability concerns. Effectively these organizations are saying that they don't want to own the assets or to operate the system in their own data centers [2]. Cloud Computing offers its users services and applications, which are provided through the Internet, and thus, a large number of computers will be in the path of the data when the data is sent to the Cloud for analysis, and, also, when the data is coming back from the Cloud, once the analysis has been already carried out. For instance, a Mobile phone or PDA with low processing power and/or low storage capacity could take advantage of the Cloud and store or process data inside it, which would allow the mobile phone or the PDA to use applications which require more processing power than the processing power available in these kinds of electronic devices and, which will also require a permanent broadband connection in order to send and receive data at any moment from any place, thus allowing the user to access the services wherever you are [1].

TYPES OF CLOUD

PUBLIC CLOUD

In a typical cloud computing scenario organizations run their applications from a data centre provided by a third-party – the cloud provider. The provider is responsible for providing the infrastructure, servers, storage and networking necessary to ensure the availability and scalability of the applications. This is what most people mean when they refer to cloud computing i.e. a public cloud. [2]

PRIVATE CLOUD

A private cloud is a proprietary computing architecture, owned or leased by a single reorganization, which provides hosted services behind a firewall to "customers" within the organization. Some commentators regard the term "private cloud" as an oxymoron. They say that the word "cloud" implies an infrastructure running over the Internet, not one hidden behind a corporate firewall. [2]

PUBLIC CLOUD VERSUS PRIVATE CLOUD

There is, however, a larger body of opinion suggesting that private clouds will be the route chosen by many large enterprises and that there will be substantial investment in this area. Already vendors are lining up to release products that will enable enterprises to more easily offer internal cloud services. Whilst we will undoubtedly see a huge growth in private clouds we need to be careful that this is not just some re-badging of what is there already. Calling the services offered by the internal data centre a "private cloud" without changing management processes, organization/culture and the relationship with business customers is not going to hack

Prof. Tripti Sharma, Department of Computer Science & Engineering, Chhatrapati Shivaji Institute of Technology, Durg, India, 8966000053.

Bhupesh Kumar Dewangan, Department of Computer Science & Engineering, Chhatrapati Shivaji Institute of Technology, Durg, India, 9926231699.

Sanjay Kumar Baghel, Department of Computer Science & Engineering, Chhatrapati Shivaji Institute of Technology, Durg, India, 9009977750.

it. If your data centre can't provision new environments, add new storage or increase computing power within minutes (or at worst within hours) then you are not operating in a cloud environment. Today there are very few companies that have the internal knowledge and the resources to create and effectively manage true cloud computing infrastructures. This will change as the market for cloud services matures and as new products emerge to help with rolling out private cloud-related services within the enterprise data centre. We will also see the adoption of hybrid cloud environments where organizations will combine the advantages of a public cloud with an internal private cloud. Some applications, or parts of applications, could run in the public cloud while others remain behind the corporate firewall. This paper examines the issues around cloud computing in its true sense of the meaning i.e. the public cloud. However, many of the points made can be applied to a private cloud. Regardless of which route you end up following (private, public or hybrid) your expectations of what you should be getting for your money remain the same. [2]

GRID COMPUTING

A Computational Grid is a collection of heterogeneous computers and resources spread across multiple administrative domains with intend of providing users easy access to these resources. [1]

Three point checklist to define what a Grid is. In this list he said:

"Coordinates resources that are not subject to centralized control": Which means that not only one entity manages all the system but some different system administrators could be managing different parts of the same Grid at the same time.

"Using standards, open, general-purpose protocols and interfaces": This will allow to all the companies involved in the Grid to use and access these standards.

"To deliver nontrivial qualities of service": In Grid computing not a fixed rate of load is going to be managed and this can be given small or big rates. This phenomenon causes the given quality of service to vary and not always stay constant.[1]

Grids allow the use of idle resources. Through this, companies create a Grid in order to share those idle resources and, if necessary, they can access more computational resources (shared by other companies) than they usually can, and share their own resources while they are not carrying out any computationally demanding tasks. About the architecture, a lot of heterogeneous hardware is used in order to create the Grid and, in addition, these devices are not managed by only one person but by different system administrators in each of the companies. This situation causes the security, administration policies and network managing to become heterogeneous too, thus more difficult to manage.

II. DIFFERENCES BETWEEN CLOUD AND GRID COMPUTING

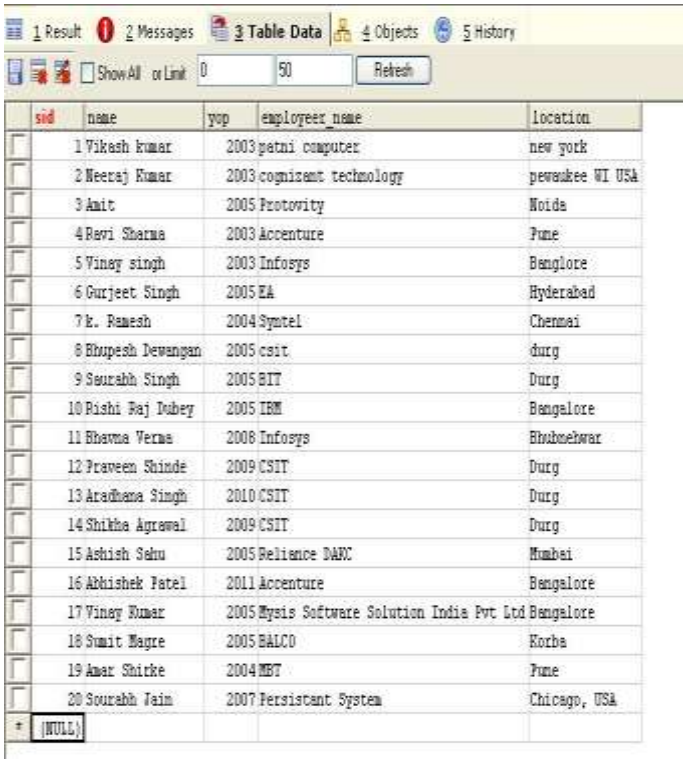
S No.	Cloud Computing	Grid Computing
1	Cloud computing normally runs in a set of homogeneous computers	but Grid, on the other hand, runs on heterogeneous computers
2	Cloud Computing offers two types of Calculus's: standard and intensive	Grid computing is normally focused on an intensive calculus
3	Cloud Computing is not an open source	Grid computing is open-source
4	in Cloud Computing all users share all the resources at the same time	Most Grids use a batch-scheduled compute model
5	Cloud does relay on virtualization.	Grids do not rely on virtualization
6	Cloud Computing is funded mainly by its users	Grid is mostly publicly funded at local, national and international levels
7	Cloud Computing attempts to share only the user interface while the resource interfaces are hidden and given in an abstract way	Grid computing, must share user and resource interfaces to allow providers to connect their resources

III. METHEDOLOGIES

Approach behind this is to calculate execution time in both cloud and grid computing. Here a database alumni_record is processing in cloud computing, and total time is taken by cloud is taken then after same database is processed in grid computing and total processing time is taken then after both processing time is compared

ALGORITHM

calculateProcessingTime()
initialize initTime to a current time
call the connect function to establish the connection
between cloud server and local server
if(connection is establish)
submit the process in local server
local server call cloud server to accept the process
if(accepted == true)
then cloud server process the request
return the result to local server
call the current time function store in currentTemp var
subtract the currentTemp - initTemp
store in totalTime var
End:



1 Result | 2 Messages | 3 Table Data | 4 Objects | 5 History

Show All or Limit 0 50 Refresh

sid	name	yop	employeer_name	location
1	Vikash kumar	2003	patni computer	new york
2	Neeraj Kumar	2003	cognizent technology	pewaukee WI USA
3	Amit	2005	Protovity	Noida
4	Ravi Sharma	2003	Accenture	Pune
5	Vinay singh	2003	Infosys	Banglore
6	Gurjeet Singh	2005	EA	Hyderabad
7	K. Ramesh	2004	Syntel	Chennai
8	Bhupesh Dewangan	2005	csit	durg
9	Saurabh Singh	2005	BIT	Durg
10	Rishi Raj Dubey	2005	IBM	Bangalore
11	Bhavna Verma	2008	Infosys	Bhubneshwar
12	Praveen Shinde	2009	CSIT	Durg
13	Aradhana Singh	2010	CSIT	Durg
14	Shikha Agrawal	2009	CSIT	Durg
15	Ashish Sahu	2005	Reliance DAKC	Mumbai
16	Abhishek Patel	2011	Accenture	Bangalore
17	Vinay Kumar	2005	Mysis Software Solution India Pvt Ltd	Bangalore
18	Sumit Magre	2005	BALCO	Korba
19	Amar Shirke	2004	MBT	Pune
20	Sourabh Jain	2007	Persistant System	Chicago, USA
*	(NULL)			

Figure1 Database alumni_record

Figure2 Process time by cloud

Here alumni_record is processed through cloud computing, in this database total 20 records are processed and for this 20 records cloud taken 1360 ms for processing. The same database alumni_record is processing in grid computing, grid computing is taken 108 ms to process 20 records. The variance of processing time is clear now. In figure2 total execution time is mentioned i.e. 1360 ms. Now the same database has to processed in grid computing, in figure3 total execution time taken by grid is mentioned i.e. 108 ms

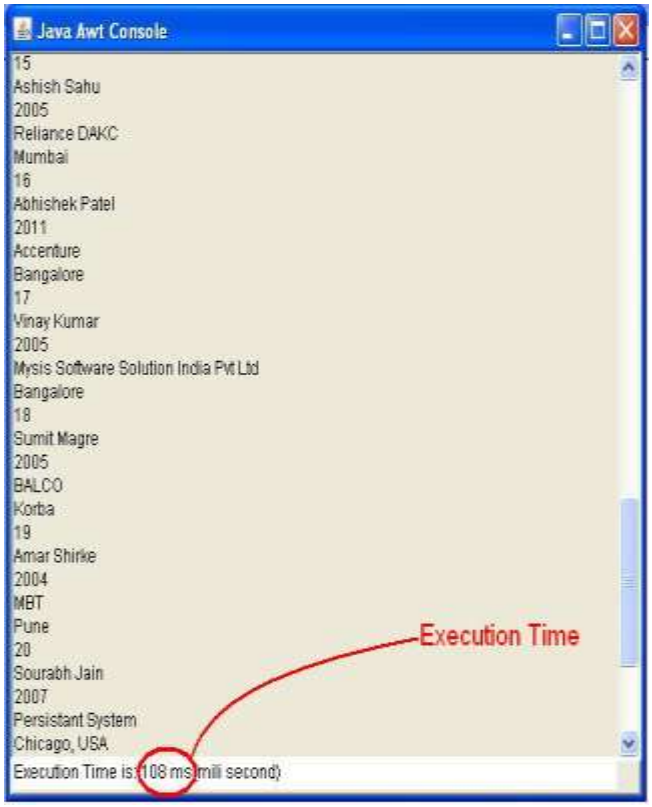


Figure3 Process time by grid

Results

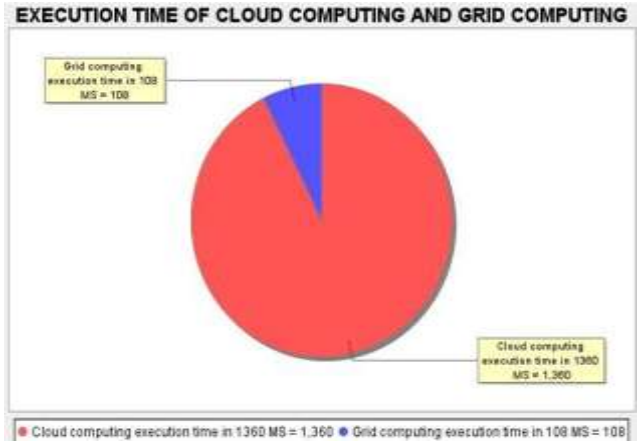


Figure4 Output

IV. CONCLUSION

Here according to data received from cloud and grid computing to process the same database its found that cloud is taking 1360 ms to execute 20 records and grid is taking 108 ms to execute same 20 record. It is clear that this data say grid computing is better than cloud computing according to exertion time base.

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AUTHORS DETAILS

Prof. Tripti Sharma, received B.E. (Computer Sc.) and M.Tech. (Computer Sc.) in the year 2002 and 2010 respectively. Currently working as Associate Professor and Head in the Department of Computer Science & Engineering at Chhatrapati Shivaji Institute of Technology (CSIT), Durg, Chhattisgarh, India, Her interests are Digital Image Processing and Data Mining. Also she is having Life Membership of Indian Society of Technical Education, India (ISTE), Membership No- LM 74671 and Institutional Member of Computer Society of India (CSI). Membership No-N1009279.

Bhupesh Kumar Dewangan, received B.E. (Computer Sc.) in year 2005 and in pursuit for M.Tech. (Computer Sc.) From Chhatrapati Shivaji Institute of Technology (CSIT), Durg, Chhattisgarh, India, His interests are Digital Image Processing, Cloud Computing and Data Mining. Also he is having Life Membership of Indian Society of Technical Education, India (ISTE) and Member of Computer Society of India (CSI).

Sanjay Kumar Baghel, received B.E. (Computer Sc.) in year 2007 and in pursuit for M.Tech. (Computer Sc.) From Chhatrapati Shivaji Institute of Technology (CSIT), Durg, Chhattisgarh, India, His interests are Digital Image Processing, Cloud Computing and Data Mining. Also he is having Life Membership of Indian Society of Technical Education, India (ISTE) and Member of Computer Society of India (CSI).