A new framework for optimizing the cost of the service architecture AWS cloud computing

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Abstract: Cloud computing is a technology which has brought a huge revolution in the stream of computers and computing and has established itself as a major stream trends in IT. This is a mechanism with which we have the access to our data and application using internet from anywhere in the world at any point of time. The data and applications lie remotely on the central remote server. In other words it is a system of providing the services using internet. It works on the strategy of providing a work experience and service based approach that interprets a Liaoning between the host, the end-user and the third party web service providers which all are joined together with the help of agents. These agents are the part of the execution service provider end which enables the scope of service costing, multi user & multi license approaches, case formation, and thus simulating an outsourced environment as which forms the substitute of the service enabling and proving cost based scenario that joins multiple service endurance and form a single strong platform, where the overall costing is divided into a large group of individuals, groups or companies so that to minimize the cost and create a market presentation more wide. Such an examples of the market places for servicing the plug-ins and applications are Google store, Nokia OVI, marketplace, KNPLabs, Mozilla marketplace and so on is a wide list of utility providers for different platforms such as Android, developers, browsers plugins, and online app providers.

Keyword: web service, Cloud computing, remote server, Cost, Optimization.

I. INTRODUCTION:

Cloud Computing is an increasingly famous and growing technology which has led to a new dawn in the field of Information Technology. It has created a drastic change in the trend of different digital devices. It is a technique in which we have the access to our data and application globally, from each and every part of the world having an internet access. The data and applications are situated remotely over the central remote server. In other words, it is the methodology of delivering the services online. With Cloud Computing, we can cut the operational and capital costs and can focus on the respective project instead of keeping eye on the functioning of the datacentre. For example, remember the times when we installed Microsoft office on each of our organization's computers. Either we go around with a setup disc to install it on all the machines or we had a setup of our software distribution servers to install the application on the machines. And when there is a service pack issued by Microsoft, we again have to run around and install the pack or we have to re-setup our software distribution servers to distribute it accordingly. The license involved is very costly. We may use the office applications only a few times a week, but the cost of the license is same as everyone else's. The main advantage of cloud computing technology is that some other company is hosting our application i.e., they handle all the cost involved for the servers, manage the software updates and modifications, and the pay-per-use policy authenticity. Cloud Computing corresponds to both, the applications provided as services over the internet and the hardware elements and systems software in the data-centers that provide those respective services. These services themselves are being referred to as Software as a Service (SaaS). The data-centre hardware and software as a whole is what we will refer to as a Cloud. The consumer can access the service related to computer, whether it is a software or hardware or infrastructure, and pay for the respective duration he accessed that particular services, that is, "Pay as per Usage". With the help of this technology, the users don't have to invest in loads or find difficulties in the set up and maintenance the complex IT Infrastructure. The name, cloud, is given due to the involvement of internet which is a metaphor of internet. The main advantage of cloud computing is that it reduces the cost and complexity of buying for good; configuring and managing all the hardware and software required for the application. Now, anyone in the world with an active internet connection can build powerful stand-alone applications with the services and features provided by Cloud Computing. Cloud Computing architecture allows users to make use of IT hardware and software in a better and efficient way. It increases the overall gain by improving resource utilization at its whole. Resources sharing

from large pool of cloud pulls down cost and increases utilization by delivering resources only for as long as those resources are required. Data centre hardware and software, combined, we are referred to as a cloud. When it is made available to the general public in a cloud-in-the-go system, we call it as a universal cloud. The services sold here are called utility computing. Current examples of public utility computing include Amazon Web Services, Google App Engine and Microsoft AZURA. The private cloud is used to refer to the internal data centers of a business or other private organization that is not open to the public openly. We will usually use cloud computing, it will only replace transparency with other terms when it claims transparency.Service providers greatly simplify and enjoy software installation and maintenance and facilitate central control over different versions; End users can access the service "anytime, anywhere", share information and collaborate more easily and can safely store their data in the infrastructure. Cloud computing does not change these things, but it gives more applications and service providers the freedom to supply their products without providing data center as a service: such as the rise of semiconductor foundries, chips allow companies to design and sell chips. Owned by a fable. From now on we will focus on possible issues related to SaaS Providers (cloud users) and cloud providers, which receive less attention.

II LITERATURE REVIEW

Elasticity is an essential element of cloud systems and limits the power of the underlying infrastructure to adapt to variable, potential non-functional requirements, for example, the amount and size of the data supported by the application, the number of equal users, etc. Differences can be made in horizontal and vertical scalability [3], which means horizontal scalability, for example, refers to the amount of measurement, the size of the request changes, and the size of the vertical scalability examples, and thus the intrinsic amounts required to maintain the size. Cloud scalability involves both (fast) up- and down-scaling. Elasticity allows one-step forward, solid, and dynamic integration and physical resources to be extracted from the infrastructure. From the point of view of application, from the point of view of the management of the middleware, the scaling is identical, it specifically creates additional reliability requirements. In general, it is assumed that changes in the structure of the organization have been announced to the Middleweight manager first, but its changes with the large scale system can be automatically maintained.

Reliability for all cloud systems is essentialto support today's Data Centre-type applications of Cloud, reliability is considered to be one of the key features of cloud power utilization. Not to hinder the dependency, the system has the power to ensure continuous operation, such as data loss, no code is reset when executing the execution. Reliability is usually achieved through the use of unrealistic resources. Interestingly, the reliability aspects are removed from many hardware-to-software-based solutions. (File system versus redundancy RAID controller, stateless front end server versus UPS, etc.).

In particular, there is a strong relation between availability (see below) and reliability, but the reliability focuses specifically on the loss (data or execution of the execution). The quality of services is a relevant capability that is essential for many uses where the specific requirements of outsourced services and / or resources are met. Basic QoS metrics like Business Case, Response Time, Thread, etc. should be at least sure that the quality of the cloud user is ensured. Reliability is a special QoS aspect that creates a specific quality requirement.

Agility and adaptability are essential features of the clusers system that reliably relate to elastic capabilities. It includes responses to the amount of requests and changes in the size of the resource, but also adaptation to environmental conditions. Different types of resources, different qualities or different routes, etc. are needed. Optimally, resources (or at least manage them) should be autonomous and able to provide their self-power for mobility and adaptability. The availability of services and data is an essential component of the cloud system, and in the first instance, one of the key aspects of cloud evolution it lies in the ability to identify redundancy for services and information, so failure can be masked transparently. Fault tolerance is irrelevant (without a significant performance bar). It requires the ability to introduce new methods online (such as previously failed or fresh nodes). In addition to increasing parallel access, availability is typically achieved by distributing across resources to achieve the frequency of data / services and to achieve load-balancing. This cloud system's scalability can be considered as the key element.

Cost reduction is one of the first concerns to build up a cloud system that can adapt to changing consumer behaviour and reduce cost for infrastructure maintenance and acquisition. Scalability and Pay per Use are essential aspects of this issue. Notably, setting up a cloud system typically entails additional costs – be it by adapting the business logic to the cloud host specific interfaces or by enhancing the local infrastructure to be “cloud-ready”. See also return of investment below.

Pay per use: The capability to [1, 2, 5, 7] build up cost according to the actual consumption of resources is a relevant feature of cloud systems. Pay per use strongly relates to quality of service support, where specific

requirements to be met by the system and hence to be paid for can be specified. One of the key economic drivers for the current level of interest in cloud computing is the structural change in this domain. By moving from the usual capital upfront investment model to an operational expense, cloud computing promises to enable especially SME's and entrepreneurs to accelerate the development and adoption of innovative solutions.

Improved time to market is essential in particular for small to medium enterprises that want to sell their services quickly and easily with little delays caused by acquiring and setting up the infrastructure, in particular in a scope compatible and competitive with larger industries. Larger enterprises need to be able to publish new capabilities with little overhead to remain competitive. Clouds can support this by providing infrastructures, potentially dedicated to specific use cases that take over essential capabilities to support easy provisioning and thus reduce time to market.

Return of investment (ROI) is essential for all investors and cannot always be guaranteed – in fact some cloud systems currently fail this aspect. Employing a cloud system must ensure that the cost and effort vested into it is outweighed by its benefits to be commercially viable – this may entail direct (e.g. more customers) and indirect (e.g. benefits from advertisements) ROI. Outsourcing resources versus increasing the local infrastructure and employing (private) cloud technologies need therefore to be outweighed and critical cut-off points identified.

Going Green is relevant not only to reduce additional costs of energy consumption, but also to reduce the carbon footprint. Whilst carbon emission by individual machines can be quite well estimated, this information is actually taken little into consideration when scaling systems up. Clouds principally allow reducing the consumption of unused resources (down-scaling). In addition, up-scaling should be carefully balanced not only with cost, but also carbon emission issues. Note that beyond software stack aspects, plenty of Green IT issues are subject to development on the hardware level.

III METHODOLOGY

The concept of managing this research is to manage cloud computing services with a system capable of intelligent behaviour. We offer a multi-agent system integrated with the cloud, which gives it results in more flexible, autonomous and high performance. This system is a special software component that allows users to work independently without any interference. The prototype of this system has two roles: service providers and customers. The goal is to create a system that allows the customer to hide a complexity with the application program interface (API) and graphical user interface (GUI) and allow customers to select the best service provider for their needs. This system's architecture has two layers: the application layer and the Internet layer. The Application Layer includes all the applications that provide Agent Generation, Agent Management, Agent Data Recovery and all information retrieval and decision support. The system provides all the services to the customer through a standard interface. Internet level layers where necessary information is restored to meet the needs of the cloud user. All the tests and simulations of cloud framework have been done in EXO-framework. EXO-Framework is a testing cloud.

IV PROPOSED SOLUTION

As mentioned, there are many services available in the cloud which are broadly categorized into 3 categories. And we need to find a platform where all the services irrespective of the service provider and irrespective of the category (the three categories) it is belonging to, we should have access to the services we have requested for. To this problem, we can find a ready-made solution, an integrated platform that will help the user/client to get all he wants in one single Integrated Development Environment (IDE). In this IDE of ours, a user can find all the necessary things in a single, in this way he does not have to search for different cloud services or need any assistance in searching the service providers. Everything has been done already, all the user has to do is pay for the cloud subscription and the various agents for its respective tasks. Suppose a client/user has requested for a service. There are many service providers who are providing that particular service requested by the client and all are working on their own set of rules. So first of all we have to think of a solution (a process) that will work on a common platform/common interface. The next problem comes of retrieving all service providers providing that particular requested service. All these tedious tasks have been eliminated by our IDE for good.

When the links require complex, dynamic binding and are subject to rapid change, agent-based approaches should be considered. We can think of an automated process - an AGENT that does the mapping between the requirements of the user and the service providers. The idea of using agent has been discussed in. Our agent will retrieve all the service providers available on internet, select the services and optimize the services on the basis of access time or on the basis of cost.

4.1 Comparison with Existing Tools

Codiad, as shown above, is a web based IDE which offers distributive and shared application development environment for the development in a wide variety of languages, namely: java, asp.net, php, python, pearl, C,

C++, C#, android, jsp, html, xml, css, javascipt, vb.net, xhtml, ruby-on-rails, J-query, basic, CORBA, COBOL, ADA, sql, pl/sql, and many more.

When compared to some other IDE's in the market, like ***wix.com***, ***godaddy.com***, ***indiamart.com***, on the basis of the parameters like Bandwidth, we found some results which are visible in the decision table below:

Table 1: Comparison between different tools and Codiad

WEB-BASED IDE's	BANDWIDTH PROVIDED	SPACE PROVIDED	LANGUAGE SUPPORT	SUBSCRIPTION COST	OTHER
Codiad	Unlimited (as per user)	Nearly unlimited (expandable)	800+ (approx. when live)	Starts from Rs. 600 (based on cloud used)	Unlimited UI features, frameworks, cheapest & fastest
Wix	10 GB (with ads)	10 GB	Python, ruby-on-rails, java (frameworks only)	Rs. 9083.16 P.A. for premium pack	Limited space and language support
Godaddy	Unlimited (till 25 websites)	Limited to 25 websites	Many languages and tools	Rs. 8000 P.A. for unlimited pack	Privacy issues
Indiamart	1 GB	As required for your single website	ASP (classic), coldfusion	Rs. 14000 (for space) + Rs 26000 for marketing	Only for website marketing, selling & buying

5. Results

As said earlier, that Codiad is an Integrated Development Environment that works through agents and their cloning, and hence reduces the overall cost which we normally spend on various commercial and academic versions of the software's available for purchase in the market; here are some results in the support of our arguments.On the next page is a table, which shows the costs of various software's and their different packs in commercial versions, and academic versions, in a tabular form. These costs are compared with the costs we have to pay in Codiad, and their comparative total sum, in which we found that by using Codiad, we only have to pay just **2 - 5%** of the cost of the other software:

Table. 2: Price comparison table

Sno	Software Specification(Comercial/Academic/Codiad)	Distribution		
		Comercial	Academic	Codeiad
1	MS SQL Server Developer 2012 Lic ESD	2172	2172	65
2	MS SQL Server Standard Edtn 2014 Licence OLP ESD	53311	53311	1599
3	MS SQL 2014 Standard Device CAL (Client Access License) OLP ESD	12405	12405	372
4	MS SQL 2014 Standard User CAL (Client Access License) OLP ESD	12405	12405	372
5	MS Visual Studio Pro with MSDN Lic/SA (2 years upgrades) 2013 OLP ESD	67622	67622	2029
6	MS Visual Studio Premium with MSDN Lic/SA (2 years upgrades) 2013 OLP ESD	424518	424518	12736
7	MS Visual Studio Ultimate with MSDN Lic/SA (2 years upgrades) 2013 OLP ESD	926035	926035	27781
8	MS Visual Studio Team Foundation Server 2013 Sngl OLP ESD	23016	23016	690
9	MS Visual Studio Team Foundation Dvc CAL 2013 OLP ESD	23019	23019	691
10	MS Visual FoxPro 9.0 Licence OLP ESD	17508	17508	525
11	MS Windows Pro 8.1 Upgrade OLP Lic Only ESD (FQC-08190) Eligible for users of Windows P	11105	11105	333
12	MS Visual Studio Professional 2013 License Academic ESD (.net Technology)	0	4437	133
13	MS Visual Foxpro 9.0 Professional License Academic ESD	0	3019	91
14	MS Visio Standard 2013 Licence Academic ESD	0	2223	67
15	MS Visio Professional 2013 Licence Academic ESD	0	4296	129
16	MS Project 2013 Standard OLP Lic Academic ESD	0	5016	150
17	MS Project 2013 Professional (with Project Server CAL) OLP Lic Academic ESD	0	8362	251
18	MS Project 2013 Server Academic Sngl OLP Licence ESD	0	84144	2524
19	MS Exchange Server 2013 OLP Academic ESD	0	10510	315
20	MS Exchange Server 2013 Dvc Standard CAL Academic ESD	0	201	6
21	MS SQL Server Standard 2014 MOLP Licence Academic ESD	0	13328	400
22	MS SQL Server Standard 2014 OLP Dvc CAL Academic ESD	0	3102	93
23	MS SQL Server Standard 2014 Sngl (2 Core) OLP Academic ESD	0	53261	1598
24	MS SQL Server Enterprise 2014 Sngl (2 Core) OLP Academic ESD	0	204220	6127
25	Adobe Captivate 6 with 2 yr maintenance ESD	76438	76438	2293
26	Adobe ColdFusion 9.0 Standard - [2 CPU] ESD	108167	108167	3245
27	Adobe Flash Builder Standard 4.7 ESD	16986	16986	510
28	Adobe Flash Builder Premium 4.7 ESD	47674	47674	1430
29	Adobe Font Folio 11.1 ESD	32450	32450	974
30	Adobe Framemaker 11.0 Windows ESD	73713	73713	2211
31	Adobe Freehand 11.0 ESD	28764	28764	863
32	Adobe JRun 4.0 Windows/Unix /Linux (Per CPU) ESD	64827	64827	1945
33	Adobe Lightroom 5.0 ESD	10336	10336	310
34	Adobe Pagemaker Plus 7.02 ESD	38138	38138	1144
35	Adobe Pagemaker Plus 7.02 DVD	43322	43322	1300
36	Adobe Photoshop Elements 11 ESD	6409	6409	192
37	Adobe Robohelp Office 10 ESD	73713	73713	2211
38	Oracle 11g/12c Std ONE Edn for Windows or Linux (5 User) Lic ESD	47767	47767	1433
39	Oracle 11g/12c Std ONE Edition for Windows/Linux Lic - Additional user Licence ESD	9387	9387	282
40	Oracle 11g/12c Std Edition for Windows or Linux (5 User) Lic ESD	94389	94389	2832
41	Oracle 11g/12c Standard Edition for Windows/Linux (Additional User) per user Lic ESD	18878	18878	566
42	Oracle Internet Application Server Std for Windows/Linux-per user Lic (Min. 10 user) ESD	12211	12211	366
43	Oracle 11g/12c Enterprise Edition for Windows or Linux (25 User) Licence ESD	1221943	1221943	36658
44	Oracle 11g/12c Enterprise Edition for Windows/Linux (Additional User) per user lic ESD	48877	48877	1466
45	Oracle 11g/12c Std ONE Edition for Win or Linux Lic only (1 CPU) per CPU ESD	293990	293990	8820
46	Oracle 11g/12c Std Edition for Windows/Linux Licence only (1 CPU) rate per CPU ESD	943879	943879	28316
47	Oracle 11g/12c Enterprise Edition for Win/Linux Licence only (1 CPU) rate per CPU ESD	2443886	2443886	73317
48	Oracle Weblogic Standard licence (Minimum 5 user) (rate per user) ESD	10433	10433	313
49	Oracle 11g/12c Application Server Enterprise Licence only (1 CPU) rate per CPU ESD	1844431	1844431	55333
50	Oracle Internet Developer Suite Windows Licence only ESD (For Development user only)	305544	305544	9166
51	PL/SQL Developer for Oracle (Single User) License ESD	16070	16070	482
52	PL/SQL Developer for Oracle (5 User) License ESD	48211	48211	1446
53	PL/SQL Developer for Oracle (10 User) License ESD	80352	80352	2411
54	PL/SQL Developer for Oracle (20 User) License ESD	107136	107136	3214
55	PL/SQL Developer for Oracle (50 User) License ESD	187488	187488	5625
56	PL/SQL Developer for Oracle (100 User) License ESD	267840	267840	8035
57	PL/SQL Developer for Oracle (Unlimited User) License ESD	535680	535680	16070
58	Intel® VTune™ Amplifier XE 2013 for Linux* OS - Single Commercial (ESD)	58525	58525	1756
59	Intel® C++ Composer XE 2013 for Linux* OS - Single Commercial (ESD)	45505	45505	1365
60	Intel® Fortran Composer XE 2013 for Linux* OS - Single Commercial (ESD)	65035	65035	1951
61	Intel® Composer XE 2013 (C++/Fortran) for Linux* OS - Single Commercial (ESD)	94330	94330	2830
62	Intel® VTune™ Amplifier XE 2013 for Windows* OS - Single Commercial (ESD)	58525	58525	1756
63	Intel® C++ Composer XE 2013 for Windows* OS - Single Commercial (ESD)	45505	45505	1365
64	Intel® Visual Fortran Composer XE 2013 for Win* OS - Single Commercial (ESD)	55270	55270	1658
65	Intel® Visual Fortran Composer Professional with IMSL for Windows* (ESD)	133390	133390	4002
66	Intel® Math Kernel Library 11 for Windows* Commercial (ESD)	32485	0	975
67	Intel® Math Kernel Library 11 for Linux* Commercial (ESD)	32485	0	975
68	Intel® Visual Fortran Composer Professional with IMSL for Windows* AE (ESD)	61780	61780	1853
69	Intel® Math Kernel Library 11 for Windows* Academic (ESD)	0	16210	486
70	Intel® Math Kernel Library 11 for Linux* Academic (ESD)	0	16210	486

For Codiad(Total price subscription) =	Rs. 3,98,965	Rs. 3,88,058	Rs. 4,00,915
For Commercial(Total price subscription) =		Rs. 1,18,43,818	
For Academic (Total price subscriotion) =		Rs. 1.14.15.279	

6. CONCLUSION AND FUTURE SCOPE

The essential characteristics of Cloud computing is sharing and pooling of resources; in other words Clouds is a platform of computing resources to be shared by multiple consumers suiting their individual requirements. The applications and data can be shared by a number of enterprises, persons and/or the cross-platform users. The sharing and pooling of resources means:

- To utilize the resources by combining the resources of various Cloud providers; who may enter into venture through co-operations,
- To map, schedule and coordinate resources for sharing, and
- To establish the contracts between service providers and the users.

The essential features in agent-based Cloud computing is based on cooperation and negotiation. The agents for coordination protocols adopt the system to automate activities to cause pooling of the resource for sharing the Clouds. The requirement for Cloud management systems is to manage the resource continuously and preserve process by monitoring the requirement for current service requests. To amend to meet out the future service requests. To adjust the schedules autonomously. The prices are kept with the considerations to accommodate the changing resource demands dynamically. The Cloud resources are autonomously managed by the Software agents at appropriate level. The end users are required to decide the service providers most suitable to make his/her requirement and to negotiate with the service providers' best deal to suit the need of the end users at lowest price to match his/her requirement of the services for smooth as well as economy in operation.

At the same time the service providers are required to evaluate whether they do have the services which are required by the end users and to price according to the need of the end user so that right services are provided at the right price before entering into contract with the end users. The service provider has also to take into account if any of the services are to be borrowed by any other service providers. The challenges of meeting the requirements by the service providers acts as motivating forces. Understanding of the future plan of the end users helps the Cloud service providers in updating to meet out the dynamically changing resource demands. The cloud computing service provider agents are required to live up to demands of the end users and also to keep pace with development all around and to keep the consumers updated with new developments and the price for new services or price with change of schemes with new discoveries in the field to bolster the services and achieve new heights.

Every coin has two face, so is the Cloud computing. However the advantages of using cloud computing with economic advantages of cost effectiveness is finding its acceptance worldwide by the corporate sectors as well as individuals and is moving ahead at faster pace. The fact that cloud computing is still in an infant age but it holding its strength and has great potential of growth in future. Cloud Computing users base is growing constantly. More and more big players are being attracted with passage of time and it is offering better and smoother as well as fine-tuned services and solutions. Future research shall further is made to mitigate disadvantages. There is no second thought that the cloud computing had made IT a little bit easier, cheaper, eco-friendly.

7. FUTURE SCOPE

This shown version of Codiad is a basic commercial version. In not so distant future, we are trying to develop and enterprise version having much more commercial features and an integration of about 800 languages approx.The enterprise version is under development now. Other features of that version will be faster processing, much more rich Graphical User Interface, more options for usability and making the user's task even simpler. Also it will be available on ***Microsoft Azure*** Cloud, with a paid subscription plan, which will provide Codiad speed, reliability, distributed accessibility, data security through an integrated antivirus in the cloud and ease of access.This version could directly be used with just a monthly cloud cost, and nothing more, which is normally 2-5% of the cost of other softwares available in the market.

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