

Hybrid Cloud selection Approach to Automate Router in Cloud Service Selection Based on Decision Support System

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Abstract: Current research on cloud computing adoption has focused on identifying factors influencing cloud computing decision and testing the impact of a predefined set of factors on the intention to adopt cloud. There are various technical and economic factors governing the cloud adoption. Security, reliability, cost, virtualization, need, on demand service, maintenance, integration and user friendliness are some of the common factors. The increasing number of cloud service users renders it critical for firms to select cloud service suppliers that suit all company business strategies and goals. From the literature review, we found a lack of research addressing the interdependence of decision criteria. In this study, we address this crucial research gap by presenting an integrative research model that combines data mining techniques with hierarchical clustering to present a framework for cloud service selection and optical packet switching has a potential to be used as next generation data transfer technology.

Keywords: Migration step, cloud genius, Next generation networks, multi-criteria decision, Data Centers, Arrayed Waveguide Gratings.

1. Introduction:

Application of Migrating legacy to cloud is one of the non-trivial tasks since it calls for technical challenges. Hence, presenting the framework generic is Cloud-Genius. Further a significant implementation that boosts the popularly known and the multi- criteria techniques of decision making namely the Analytic Hierarchy Process. The evolution of Cloud computing in past five years has shown a potential breakthrough. Service providers of Cloud technology are Amazon Web Services (AWS), Google App Engine, or

Salesforce.com, giving use the chance to undertake application across a network of pool of resources that do not have any capital investment practically and a operating cost that is both modest and proportional to the use. By boosts service of cloud computing ok can take the benefits as pay per use, elasticity and resources abundance. Cloud computing as a technology disruptive, adoption of the same has obstacles and risks associated with it. Further, the risk has the capability to alter to problems or issues for the firm which further decides where to shift from Web Apps to cloud. Owing to such an increasing complexity on whether to shift from Web app to cloud, there exists plethora of risks, security issues and expectations from Service levels. A crucial hurdle is the issues related to the migration of Webapp to cloud based on a technical level as when the economic aspects are taken into consideration. Shifting from the data center as owned by the firm to an infrastructure as backed by cloud has multiple steps. The steps given outline the organization's migration from Web Apps to the cloud service infrastructure. Migration step to the ordering of Platform-as-a-Service (PaaS) would deliver it in various ways. Firstly, a Cloud infrastructure service that is appropriate, or an ordering of Infrastructure as-a-Service (IaaS) would be selected. This in a sees a decision that is well-thought and takes into consideration all the crucial factors, as supper quality, price, or the Service Level Agreement. The basis of data selection along with the desire measurements of each factor that give description about the service options and the quality can be compared. Secondly, the Web Application and the corresponding people that currently exists a Web server, is shifted from the data center local to the one associated with services of cloud infrastructure. So, the server and the Web application should be converted to an expected format of Cloud infrastructure. Basically, the above step

bundles web application in the form of a VM having stack software from Boston and Platform of software to describe the business logic. As the above is unachievable in most cases, that is conversion of a web application to an Infrastructure of cloud directly to be compatible with the format of VM that is ordered by the service provider of cloud as chosen and also customized. Some image to be selected needs to be correct fundamentally as it is a crucial task. Also, choice of VM image minimizes effort required for software stack installation on basic image.applications. Otherwise, such a procedure may result in a bottleneck, thereby limiting the overall system performance.The execution of optical network is made out of routers.Each one of these routers are optical or it may be electronically.

2. Related Work:

Recently adoption if the system or cloud computing assent address the challenges of storage and computing as put in by the research institutes, governments and the leaders of industry. OPS rules, header will be processed at each intermediate switching node. As discussed above header will be processed electronically, therefore it is customary that the header has a relatively low fixed bit rates Further, the system of cloud computing has been predicted to be the tool of future management for organization that involve environment of Innovation in technology. Also, the studies as related to the adoption of cloud computing has been analyzed and then discussed about the efficiency and comprehensive association of adoption of cloud, it's challenges and problem as performance, security and solution of cloud interoperability. Cloud computing determinants and the success factors of its adoption is one of the popular studies today Garrison et al(2012) studies the success factors that relates to the deployment of cloud computing; and drafted a relationship amidst the, technical capability, trust, managerial capability, and the perform of cloud-deployment. Low et al (2011) identifies the technological, environmental and organizational contexts relating to factors that have been proposed in earlier studies and help understand the cloud adoption decision components. Chen et al (2018) researches the models best-fitting for adoption of cloud services within an organization. Lastly, Walther et al (2013) develops an index of

measurement that enable accessing cloud system success along with informed quality, system quality, and net benefits.

A model as suggested by Low et al (2011)for adoption of cloud computing has been validated by the framework of TOE. Post development amidst the effects of governance and structures of IT, they get processed in extensive details. Alshamaila et al (2013)has made an attempt to trace the cloud model adoption for both small as well medium scale enterprises. Gangwar et al (2015)made an attempt to deploy framework of TAM - TOE that aids adoption of cloud computing models. Further an approach that is goal oriented has been proposed by Zardari (2016). The approach consists of requirements for goal categories, steps for engineering as well as close computing. Further a toolkit has been proposed enabling decision makers to trace risks while coordinating for techniques and tools. Additionally, they have the understanding of complexity, compatibility, along with technological awareness has not been identified. Further, in this approach, Zardari (2016) has given a guide that is systematic and surrounded by weighing the risk as associated with cloud computing. They have set up goals of organization as important. In a view of resource reliant theory, Garrison et al (2012) has drafted a cloud computing model that emphasizes on the organization capabilities having infrastructure and technology support with additional resources. Khajeh-Hosseini et al (2012)has emphasized on the cost which affects tools for cloud computing adoption and further develop a tool of modelling. Several studies consider efficiency, Institutional factors and cloud computing availability as the factors related to adoption of same. Several laws as well as regulations as suggested by Bhat are the Institutional factors. Apart from him Yeboah-Boateng and Essandoh has drafted the importance of the users and the given technical support being the environmental factors. Oliviera et al has built a model that is responsible for determinants assessments that compel adoption of cloud computing thereby presenting models assessment factors that appear holistic. They identify them as cost savings, “security concerns”, “complexity”, “relative advantage”, “technological readiness”, “compatibility”, “firm size”, “top management support”, “regulatory support” and “competitive pressure” as factors. On the basis of the above models, Gangwar et al

(2015) has states that determinants of an organization's for cloud computing adoptions were "complexity", "relative advantage", "ease of use", "compatibility", "top management commitment", "usefulness", "education and training", "organizational readiness", "trading support by partner", "competitive pressure", Gutierrez et al (2015) saw that "competitiveness", complexity", "technology readiness", "and "trading partner's pressure" are the decision-makers' that affect factors for adoption of cloud computing. Ray (2016) further developed the four crucial area of focus for adoption of cloud computing consisting of security, reliability, vendor expertise, and also availability. Singh *et al.* (2017) Requirement of network capacity is increasing due to growing demand of internet traffic. Data centre network traffic is boosting steadily due to arising mobile, internet and cloud services. In this research four photonic packet switched architectures namely feedback loop buffer and arrayed waveguide grating (AWG) based switch, loss compensated feedback loop buffer and AWG based switch, electronic memory and AWG based optical cloud computing switch, and buffer less optical cloud computing switch PETABIT have been analysed for their optical cloud cost and physical loss.

3. Problem Statement:

An approach to provide decision support in application migration to the Cloud that addresses concerns of application developers as well as stakeholders in identifying important decision points like how an application is distributed, which scalability strategy is followed, how is multi-tenancy applied, and which service provider and offering is selected, is need of the hour because of emergence of cloud ready applications. Several approaches has been discussed related to Cloud Service Selection but most of them lack the interdependence of major factors and are not able to link them to build one common framework. This particular problem is addressed along with incorporating all possible stakeholders into the decision making of cloud service selection process.

4. Solutions:

As discussed in above sections, the primary objective of this research is to suggest a hierarchical decision structure model with the decision areas, factors, and attributes based on the

underlying decision factors of cloud computing adoption. The model will support the decision prioritization for cloud computing service adoption and system management. The research objectives can be summarized as below:

- To describe cloud applications so that the application requirements and customer preferences are automatically identified and extracted. This is to reduce the interactions between the customer and the system and to entrust tasks to the system when possible.
- To describe and model all the different factors including technical, economic, legal, security and scalability to provide a unified model of cloud service selection.
- Develop a framework to compare cloud service performance of the different cloud service providers.
- A statistical comparison of the derived model with that of the existing models to evaluate the performance of the developed model.
- What is obvious in all the discussion earlier is that application migrating to Cloud needs various decision that relates to the way application gets refracted to cloud. In the above sense, the performance and the cost analysis needs to lay focus on the SOT A as were discussed in second section and provide variant support. Considering the above, there is a provision of implementation of the system of Decisions that would aid the cloud migration. This is a way describes the vision that lead to a solution for the stakeholders and the developers thinking on how to migrate.
- Also, there exists two kinds of concepts and has identified the decision that has to be made and also the tasks that would aid decision making process to get the better outcome.
- All the above decisions owing either a direct or an unintentional influence and has been shown with transparent arrows. Choosing on the strategy appropriate for instance is not useful in absence of the supportive Cloud service provider. The service provider's selection has the decision that is to be used

by the model of delivery service. Hence, the options both as application distribution and the maintenance could be effectively applied and influenced. Additionally, the below given task are also stated:

- **Work Load Profiling**

Estimating or defining the work expected as of the application load profile is needed to perform tasks and also for decision input as how distribution of application occurs and how elasticity maps the profile.

- **Compliance Assurance**

Affirming the regulations compliance as personal data privacy has an impact on selecting providers and also the distributed application as retaining Personal data.

- **Identification of Security Concerns**

- Giving description of the communication and data appears crucial and needs to be secured with appropriate provider that map above stated constraints. Application delivery is a manner that is multitenant ads constraints in terms of data isolation and should be considered

- **Identification of Acceptable QoS Levels**

On the basis of planned and existing SLAs, QoS characteristics acceptable levels as service provider availability are inferred. Beyond such a selection of service provider, the task delves it to the strategy of an appropriate elasticity to affirm the process of cloud selection.

- **Services**

On the basis of above,, CSP can be asked several queries as the server location to be used, encryption, mechanism of access control, purposes that call for data usage, along with the answer to outsource the information sharing with all other firms and finally

the place mechanism which enforce CSP to map the requirements of organization .

- **USECASE for Proposed system:**

System objectives consists of overall requirements planning, hardware design validating, software debugging and, testing under development, drafting help reference online, and also performing task that are oriented to customer service.

For instance, the product sales use cases must use items as updating catalog, ordering, customer relations and, payment processing.

Use cases were submitted from several TC members; however for consumption ease and comparison, all has reflected Use Cass Template. Identities have been used by cloud infrastructure. In case there is one such configuration which is a standard accepted, then migration becomes easier. Such migration type appears desirable in permitting subscribers to move applications amidst types of cloud deployment and cloud providers without losing the application.

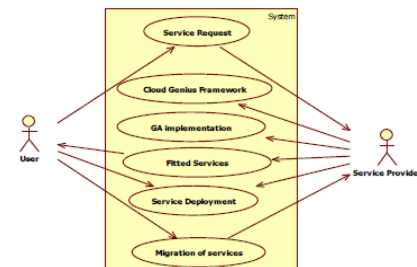


Figure 1.1: Use case for proposed system

- A use case is kind of method as used in analysing system to clarify, identify, and organize requirements of system. Here, system is something they is either operated or developed. Diagram of Use case has been UML employed. Unified Modeling Language is the standard for visualizing the system's and objects of real world.
- In the welcome page of web service, relying on ways in which the applications gets distribute help Services. Ways by which purpose is selected, strategies of elasticity being defined and how the same drafts projections pertaining to the application nonfunctional behavior post Cloud migration.

- It provides entry of multiple points to the process of decision making when migration to Cloud is attained. Hence, the support system of cloud migration must support the above in a network form and not just a hierarchical way. This allows the designers of application to give various answers for all decision that are made and then ask them an input that aids performing tasks and help study the impact of the corresponding decisions to goals as application's performance and cost. This kind of approach is absent in present State of the Art that constitutes the future work of process of Service selection.

4. Conclusion:

To support these organizations a decision support system is to be developed in this research work. An effective DSS needs to describe how a decision-making process is articulated. It is necessary to understand the objective and its steps that lead them to make decisions and the extent of the influence exerted on them by the subjective attitudes of the decision makers and the specific context within which decisions are taken.

The proposed methodology includes a decision support system which constitutes of a decision model including Decision Meta Model, Software Quality Model, Domain Description, and Feature-Values. The Decision Meta- Model defines the base structure of a decision model in the knowledge base, and it has two sets namely Qualities and Features. The Decision Meta-Model and Software Quality Model are immutable for decision models based on the DSS approach. However, the Domain Description and Feature-Values should be define to structure a decision model for an multi criteria decision making problem.

A framework for providing decision support system to software organizations will be discussed. The various factors involved in making a selection decision will be discussed. The common problems and challenges occurring in the research domain will also be figured out. The design methodology will use a decision support model for solving the cloud selection decision problem and forms the basis of the future development in the research. Optical storage will allow high speed data transmission , in electronic buffer data will stay at

least $\beta+1$ optical slots. During this time, first packet will be electronically stored and will be retrieved from electronic buffer and again E/O buffer, thus in terms of speed limitations.

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