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Implementation of an Adaptive and Dynamic Portfolio to Allocate Web Services in the Cloud

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Abtract-We view the cloud as a marketplace for trading instances of web services, which can be "leased" by web applications. We argue that the application can "buy" diversity by selecting instances of web services from multiple cloud sellers in this market. The approach portfolio theory to construct a diversified portfolio of web service instances, which are traded from multiple cloud providers. With the growing rate of data used in applying the storage space along with the price for maintaining the data storage increases, thus everyone move towards cloud domain, hence an effective platform is needed for the purchase of the cloud domain and satisfy the following condition, Test the approach effectiveness in minimizing the risk of SLA violation. Simulate the dynamic and adaptive behaviour of the approach in responding to changes in the market conditions and risk

Evaluate the sensitivity of the allocation decisions to risk and its correlation with other candidates. Evaluate the scalability of the approach and its ramifications on risk reduction under extreme scenarios. We use a portfolio based algorithm which satisfies the above condition and helps the user to get the required web service with the fluctuating changes in the market without changing the SLA.

Selection of cloud-traded services is a relatively new area. However, none of the approaches have considered the problem of diversity in web services, selection through trading and portfolio thinking. The current web services allocation solutions in the cloud market.

1.INTRODUCTION

A cloud refers to a distinct IT environment that is designed for the purpose of remotely provisioning scalable and measured IT resources. The term originated as a metaphor for the Internet which is, in essence, a network of networks providing remote access to a set of decentralized IT resources. Prior to cloud computing becoming its own formalized IT industry segment, the symbol of a cloud was commonly used to represent the Internet in a variety of specifications and mainstream documentation of Web-based architectures. This same symbol is now used to specifically represent the boundary of a cloud environment, as shown in Figure 1.It is important to distinguish the term "cloud" and the cloud symbol from the Internet. As specific environment used to remotely provision IT resources, a cloud has a finite boundary. There are many individual clouds that are accessible via the Internet.Whereas the Internet provides open access to many Web-based IT resources, a cloud is typically privately owned and offers access to IT resources that is metered.Many approach have proposed implementing design diversity techniques to increase the reliability, availability and security of large-scale systems.

However, none of them have explicitly linked the distribution of resources to risk and correlation between different candidate providers. The challenge would be to find an efficient and effective solution for inversiting in diversity while considering the risk and correlation between providers. Moreover, the dynamic nature of the cloud mptivates the need for adaptation in that solution.Much of the Internet is dedicated to the access of content-based IT resources published via the World Wide Web. IT resources provided by cloud environments, on the other hand, are dedicated to supplying back-end processing capabilities and user-based access to these capabilities. Another key distinction is that it is not necessary for clouds to be Web-based even if they are commonly based on Internet protocols and technologies. Protocols refer to standards and methods that allow computers to communicate with each other in a pre-defined and structured manner. A cloud can be based on the use of any protocols that allow for the remote access to its IT resources

2. RELATED WORKS

[1]Cloud computing is a new and promising paradigm delivering IT services as computing utilities. As Clouds are designed to provide services to external users, providers need to be compensated for sharing their resources and capabilities. In this paper, we have proposed architecture for market-oriented allocation of resources within Clouds. We have discussed some representative platforms for Cloud computing covering the state-of-the-art. We have also presented a vision for the creation of global Cloud exchange for trading services

[2]Service composition in multi-Cloud environments must coordinate self-interested participants, automate service selection, (re)configure distributed services, and deal with incomplete information about Cloud providers and their services. This work proposes an agent-based approach to compose services in multi-Cloud environments for different types of Cloud services: one-time virtualized services, e.g., processing a rendering job, persistent virtualized ser-vices, e.g., infrastructure-as-a-service scenarios, vertical ser-vices, e.g., integrating homogenous services, and horizontal services, e.g., integrating heterogeneous services.

[3] The paradigmatic shift from a Web of manual interactions to a Web of programmatic interactions driven

by Web services is creating unprecedented opportunities for the formation of online Business-to-Business (B2B) collaborations. In particular, the creation of value-added services by composition of existing ones is gaining a significant momentum. Since many available Web services provide overlapping or identical functionality, albeit with different Quality of Service (QoS), a choice needs to be made to determine which services are to participate in a given composite service. This paper presents a middleware platform which addresses the issue of selecting Web services for the purpose of their composition in a way that maximizes user satisfaction ex-pressed as utility functions over QoS attributes, while satisfying the constraints set by the user and by the structure of the composite service. Two selection approaches are described and compared: one based on local (task-level) selection of services, and the other based on global allocation of tasks to services using integer programming.

3. Proposed System

We propose a novel, dynamic and adaptive approach for implementing design diversity in the cloud market. The approach uses portfolio theory to construct a diversified portfolio of web service instances, which are traded from multiple cloud providers. We illustrate the applicability of the approach. Evaluate the sensitivity of the allocation decisions to risk and its correlation with other cloud providers. Evaluate the scalability of the approach and its ramifications on risk reduction under extreme scenarios.

- ✓ It's used to minimizing the risk of SLA violation.
- ✓ Its dynamic and adaptive behaviour of the approach in responding to changes in the market conditions and risk.
- ✓ Its allocation decisions to risk and its correlation with other candidates.
- ✓ In proposed system we have add the ratings and feedbacks for the user reference.
- ✓ If SLA, violation occurs on one of the candidate services, there is a great chance that it will not have any effect on the other of our resources as they are allocated to different independent providers.
- ✓ The research has used auction-based methods to allocate all the instances of web service from a single provider or multiple providers that have the lowest price and optimal QoS dynamically.

4. Module Description

User Module

In this module consist of two sub modules:

1. Registration
2. Login

- ➢ The registration module contains Name, User Name, Email id, Conform email id, Mobile number, Password, Conform Password. In here collect all the information about user with validation. The login module contains user name or email id and Password

Admin Module

- ➢ In this module first the admin login to this page then they can view the entire database.
- ➢ In this database can contains all the information about users like user's comments, rating then who are all buy the clouds in which rate.
- ➢ Also it contains chart representation depends on best of cloud.

Authentication Module

In this module consist of 5 sub module

1. Portfolio based
2. Classical based
3. Price based
4. Risk based
5. Popularity based

Portfolio based allocation

- The main motivation of this algorithm is can support the User. It will give the clouds for User preference
- It contains database of cloud details and chart representation
- In here we can buy the values of Quality of Service, Risk, Price, and Number of Instance from User.
- It will pick and give the best cloud to the user with their afford price by using portfolio based allocation algorithm.
- Then collect feedback and rating from user. It will store in database.

Classical based allocation

- This also contains database of cloud details and chart representation.
- In here we can buy the values of Number of Instances and Cloud provider from User.
- It will pick and give the best of cloud from database depends on Number of Instance with their afford price.
- Then collect feedback and rating from user. It will store in database.

Price based allocation

- This also contains database of cloud details with the price is comes under the ascending order and chart representation.
- In here we can buy the values of Number of Instances and Cloud provider from User.
- It will pick and give the cloud based on the Price from database depends on Number of Instance with their afford price.
- Then collect feedback and rating from user. It will store in database.

Risk based allocation

- This also contains database of cloud details with the Risk is comes under the ascending order and chart representation.
- In here we can buy the values of Number of Instances and Cloud provider from User.
- It will pick and give the cloud based on the Risk from database depends on Number of Instance with their afford price.
- Then collect feedback and rating from user. It will store in database.

Popularity based allocation

- This also contains database of cloud details with the Popularity based and chart representation.
- Then collect feedback and rating from user. It will store in database.

5. System Architecture

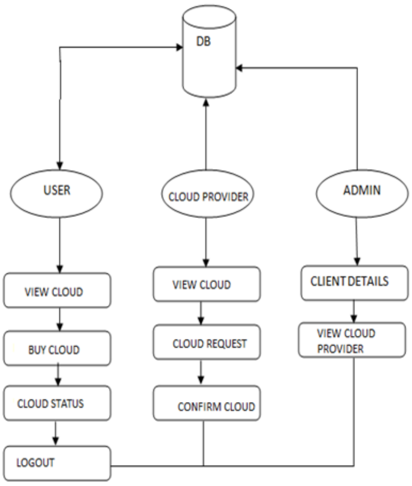
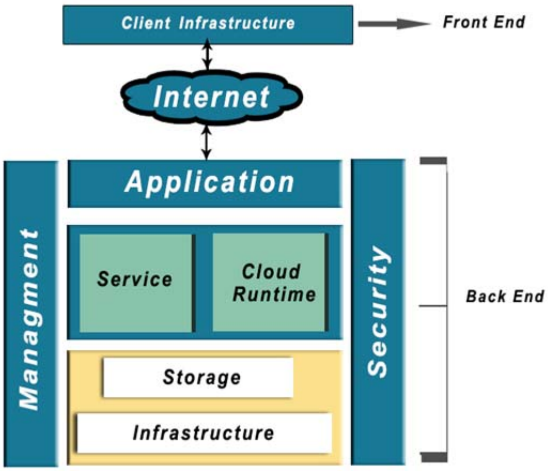


Fig.6 System Architecture

6. Architecture Of Cloud Computing



6.1 Public Cloud

A public cloud is offered over the Internet and are owned and operated by a cloud provider. Some examples include services aimed at the general public, such as online photo storage services, e-mail services, or social networking sites. However, services for enterprises can also be offered in a public cloud.

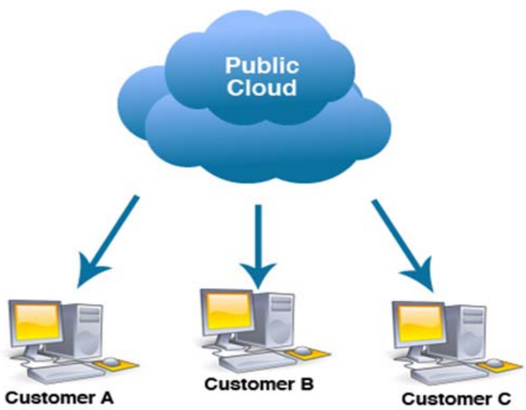


Fig.7.1 Public Cloud

6.2 Private Cloud

The cloud infrastructure is operated solely for a specific organization, and is managed by the organization or a third party.

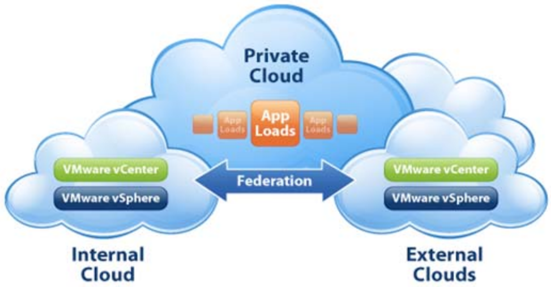


Fig.7.2 Private Cloud

6.3 Hybrid Cloud

A combination of different methods of resource pooling (for example, combining public and community of clouds

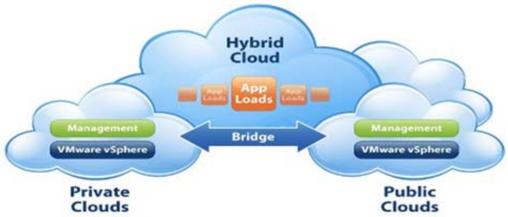


Fig.7.3 Hybrid Cloud

6.4 Community Cloud

The service is shared by several organizations and made available only to those groups. The infrastructure may be owned and operated by the organizations or by a cloud service provider.

Fig.7.4 Community Cloud

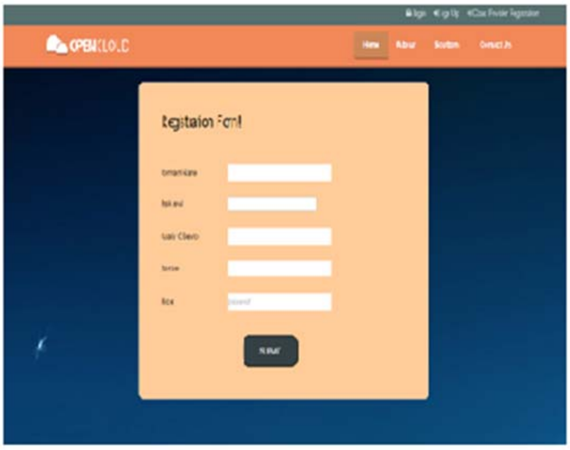
7. Algorithm

Begin
Step 1: if (first adaptation cycle)
Step 2: then set number of services required
Step 3: set QoS and price constraints
Step 4: set weight of quality attributes PWA, WE and PWF
Step 5: end if
Step 6: for each service Si in Market new
Step 7: if Si satisfies all constraints
Step 8: add Si to set of candidate services S
Step 9: end if

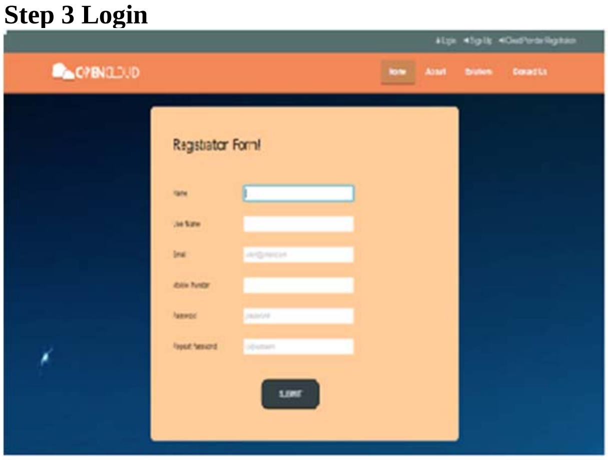
Step 10: end for
Step 11: for each candidate services Si. 2 S
Step 12: calculate aggregated QoS qi
Step 13: get correlation pij
Step 14: get risks Ri
Step 15: end for
Step 16: New portfolio ¼ quadprog (mim (eq. (8)), S.t. (Eqs. (6), (7))
Step 17: Calculate the risk of new portfolio Rpoptimum in Market new
Step 18: Calculate the risk of currently allocated portfolio Rpcurrent in Market new
Step 19: The potential improvement in risk Ic ¼ Rpcurrent Rpoptimum
Step 20: if ðIc ImÞ
Step 21: then submit new optimum portfolio
Step 22: else submit keep currently allocated portfolio
Step 23: end if End

Step 1 Home Page

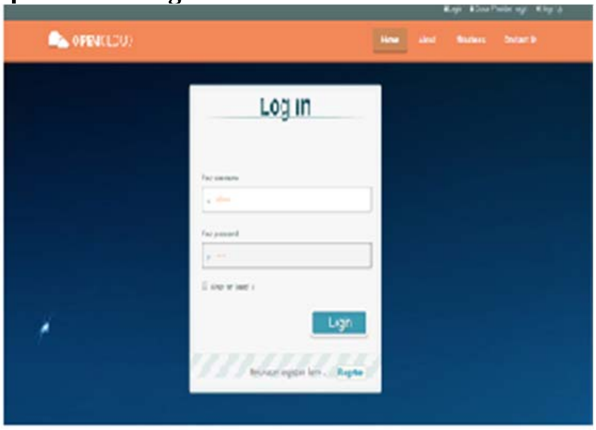
Step 2 Cloud Provider



Step 3 Login

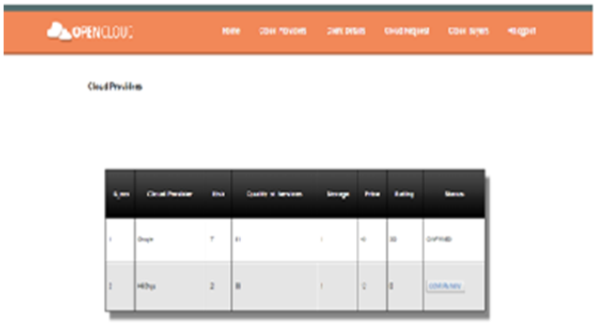


Step 4 Admin Login

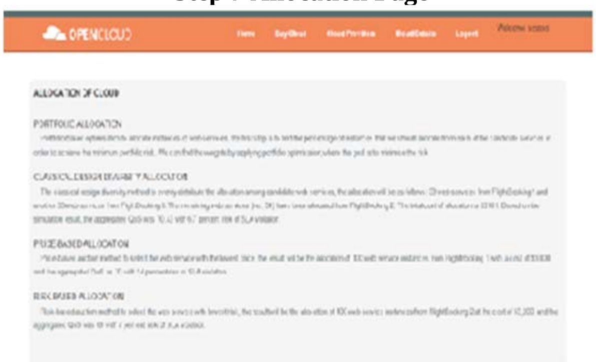


Step 5 Admin Page

Step 6 Cloud Details

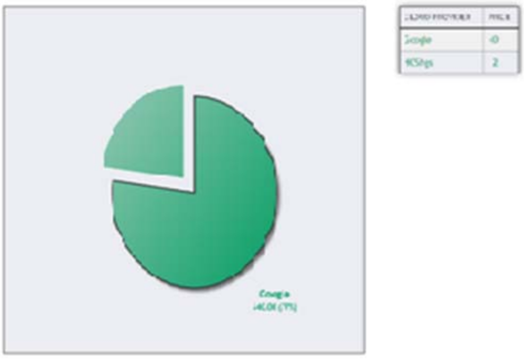


Step 7 Allocation Page



Step 8 Cloud Service

Step 9 Cloud chart



8. Conclusion

We have introduced a novel, dynamic and adaptive design diversity approach for web services selection and allocation in the cloud using portfolio thinking. We have viewed the cloud as a marketplace for trading instances of web services, which cloud-based applications can explore trade and use as substitutable and compose able entities. We have used a portfolio-based optimization to improve SLA compliance by diversifying the selection and consequently the allocation of traded instances of web services from multiple providers. In this work, we are investing in diversity on a given type of cloud services, where for every abstract service in the architecture, there exist numbers of concrete candidate's services

Future Enhancement

The scope of the project is buyer can buy the cloud in easy way by agent(Market regulator). The market regulator can also monitoring the Service Level Agreement(SLA) voilation complaince and probable risk. The main Scope of my project is to improve the SLA voilation by using portfolio-based optimization

Refernces

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