

Process Frame Work for Cloud Computing Migration

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Abstract - Cloud computing is an active resource area of practice in the computing industries. With the comprehensive characteristic and effectiveness of the computing environment it is validly used in all over the world. Software developing companies and global enterpriser are moving towards the cloud computing environment for it is vital services. The prime cloud computing services are SaaS - Software as Service, PaaS - Platform as Service, AaaS- Application as Service, IaaS - Infrastructure as Service. . In order to migrated from the exiting software environment to the cloud infrastructures several procedures are to be followed for the migration. In this paper we are discussing the migration process and proving active framework for cloud computing migration.

Index Terms - SaaS - Software as Service, PaaS - Platform as Service, AaaS- Application as Service, IaaS - Infrastructure as Service

I. INTRODUCTION

A. Cloud computing

Cloud computing get more popularity for its characteristics of services in which an organization or an individual can access a large pool of resource from anywhere as an on demand services. On demand service of cloud offer scalability, portability, reliability, cost effective for the resource accessibility. It furnishes a new way of resource sharing methodology for the computing industries. Cloud computing service providers are rapidly increased in the recent years for it "pay per use" as service model. The foremost cloud services providers are Google App Engine (GAE), Amazon Elastic Cloud (AEC), Microsoft Azure., etc and each service providers are unique with their features. Since progression of data mining and data warehousing are made simplified with the cloud environments .It is predictable about 70% of IT industries are moving to cloud environment in the year 2018. Cloud computing gives IT industries to be more comfort in the automation resource sharing as pay for use services. Cloud brings the friend approach in resource sharing among multiple servers and offer defined frame work for the multiple cluster approach. Cloud computing is classified as Public cloud, Private cloud and Hybrid cloud.

1. **Public Cloud** - Resources such as application, storage, and other model are made as public by the cloud providers. They are available to the public through the internet as pay per use service. In which the restriction and authorizations are define by the cloud service providers according to the need of the customers. The divergent benefits of using a public cloud computing are it is trouble-free to use hardware, application, and bandwidth without any investment. It makes high scalability to collect requirements. The leading public cloud providers are IBM Blue Cloud, Sun Cloud, Amazon Elastic Compute Cloud (EC2), Google AppEngine, and Windows Azure Services Platform.
2. **Private Cloud** - Private cloud computing environment are created Inside a particular organization with the proper firewall authentication and security. The corporate or organization implementing the private cloud computing are responsible for its own security of company data and security policy. Third party cloud providers are restricted to access the security rights.

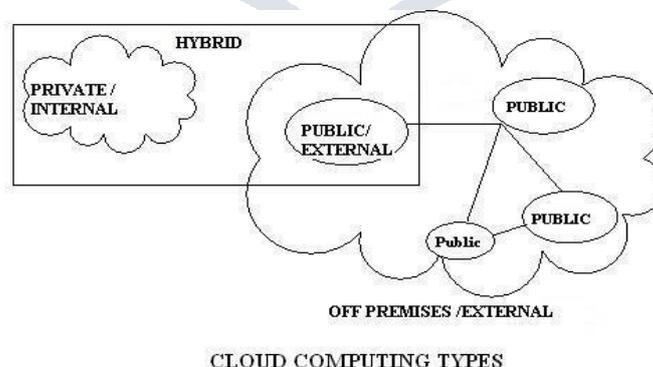


Fig.1. Types of Cloud Computing

3. **Hybrid Cloud** Hybrid cloud computing is a combination of the private and public cloud computing in which the company data are resides in the private cloud and the other resource are shared to public cloud. It provides an advantage of scalability; reliability and cost saving.

II. RELATED WORK

Cloud computing is a mixture of various application and methodology. Which includes SOA service oriented architecture, service architecture engineering. We acquire the knowledge of cloud migration by the following serve Mohagheghi and Sæther [1] have reported challenges associated with migrating applications to service cloud platforms. The reported challenges include identifying the advantages of migrating to cloud, enhancing software architecture, modifying data management schemas, addressing quality of service (QoS) and extra functional requirements, verifying the cloud-based solution and redefining business models for pay per use pricing scheme.

Razavian and Lago [2-3] have presented a framework for migrating legacy systems to SOA called SOA-MF. The migration process begins with recovering the lost abstractions and eliciting the legacy fragments. The abstraction of a legacy system is transformed into service based abstraction. Finally the target system is modified using service based abstractions and new requirements. They have also presented an overview of SOA migration approaches in[2] addressing code translation focusing on wrapping the whole code inside a web service without decomposing; service identification focusing on analyzing code and architecture analysis for services; business model transformation focusing on meta process for migration and business process reengineering approaches; design composition element transformation focusing on basic and composite design elements; pattern based composite transformation focusing on altering system architecture into the service based architecture; and forward engineering with gap analysis focusing on basic and composite design elements followed by analyzing and designing services.

III. PROCESS FOR CLOUD COMPUTING MIGRATION

The cloud migration involves various processes which are

- A. Requirement analysis
- B. Identification of Potential Cloud Hosting Environments
- C. Analyzing application for cloud environment
- D. Identification of Potential Architecture Solutions
- E. Estimation of cloud environment for cloud specific quality feature
- F. Evaluating of proposed solutions and effected components against target system.

A. Requirement Analysis

The initial process of migration is the identification of the business requirement. Targeted objective of the system are to be identified. Once the business requirement are identified each sub system are again divided into smaller units. Each unit is identifies as resource of information for migration. Each unit's requirement is analysis separately toward the migration to the cloud environment. In this requirement identification process the business analyst plays a vital role. Since it is migrated to cloud environment the each unit's data flow and process are changed from the existing environment. The following are some of the requirements are too identified.

RA1: Is the specified component of system supports for both public and private cloud environment?

RA2: Is the system has efficient to handle unexpected enlarge in storage requirement by consume storage resources and storage services of cloud provider?

RA3: End users of the system should have consolidated view of system through unified service interfaces, irrespective of actual deployment configuration.

RA4: End user operations and service requests should not be affected during system scalability.

RA5: System should efficiently acquire resources when needed and release those when not required in order to have more cost effective and green solution

B. Identification of Potential Cloud Hosting Environments

To migrate for cloud environment it is essential to identify the potential of the existing system. This includes nature of the system, data confidential, system flow and many more. The potential of the existing system are to be specified which includes the long term & private policy of the company. A variety of list of attribute of the cloud based potential are to identify to satisfy requirement.

C. Analyzing application for cloud environment

During this activity, an application is analyzed to assess its compatibility with the potential cloud computing Environments. This activity purports to identify the changes required to resolve incompatibility issues between a systems and a target platform. For example, it may be the case that a target PaaS cloud does not support frameworks or specific technologies being used by an application. If such issues are identified, then these need to be resolved first.

D. Identification of Potential Architecture Solutions

After the identification of the requirements and selecting the potential cloud computing platforms, the requirements are analyzed against each of the potential cloud environments. The application components that are sensitive to different quality attributes (such as security and privacy) are also identified. The proposed solutions are then analyzed for their advantages and disadvantages with respect to the quality attributes. At the end of this activity, a solution is selected that best satisfies the functional as well as quality requirements. In some cases, it may not be possible that one solution satisfies all the requirements. Then a tradeoff analysis is performed and an optimal solution is devised that satisfies the most important requirements.

E. Estimation of Cloud Environment for Cloud Specific Quality Feature

This activity aims at analyzing the potential cloud platforms for specific features of a provided service, e.g., SaaS that needs to be supported by a hosting platform. Few examples of these quality requirements are multi-tenancy, decentralized deployment of components on hybrid clouds, interoperability with alternative hosting clouds, and support for programming languages and frameworks. A cloud environment satisfying most important quality requirements is selected for implementation.

F. Evaluation of proposed solutions and effected Components against target platforms

This activity purports to analyze the changes that are proposed to assess how a modified system will be deployed on clouds. This is a very important activity to identify any conflict between a proposed solution and a chosen cloud environment. Other architecture evaluation techniques (such as [5-6]) can be used to support this activity. In case of discrepancies, the activities D and E can be performed again.

IV. FUTURE WORK

We are currently working in the process of migrating the existing cloud service to other cloud service provides. For example if a company using Google App Engine (GAE) as their cloud service provider, if the company wants to change to Amazon Elastic Cloud (AEC) as a cloud service. When these methodologies are explorer to the cloud computing networks it provides an easy migration process. When the migration processes are made simple it reduce the cost of cloud computing and small companies are also benefited with these services. Qualities of the service provider are increases rapidly with the simplification in migration.

V. CONCLUSION

In this paper we discussed some of the measurement for the migration for cloud computing. Main activities involved in the migration process include identification of requirements and potential cloud platforms, analyzing application compatibility with potential cloud environments, identification of potential architecture solutions, evaluation of cloud environments for cloud specific quality attributes, tradeoff analysis of potential architecture solutions, selection of architecture modifications to be incorporated and refactoring of the system to incorporate new architecture modifications

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