Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X
IMPACT FACTOR: 6.017

IJCSMC, Vol. 6, Issue. 6, June 2017, pg.473 – 477

Service Oriented Cloud Computing Infrastructure (SOCCI): A Case Study

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Abstract— Service Oriented Cloud Computing Infrastructure SOCCI provides a framework for all the important paradigms of today's world which is Infrastructure virtualization, service orientation and the cloud. It outlines the concepts and architectural building blocks necessary for infrastructures to support SOA and SOCCI. The key difference when implementing the architecture on the cloud using SOCCI and SOA are discussed. This paper provides a case study of SOCCI implementation in HP and SOA implementation in HP.

Keywords— Service Oriented Architecture, Enterprise Architecture, Cloud Computing.

I. INTRODUCTION

The world is moving from standalone computing to service oriented cloud computing. Service oriented architecture is the collection of services that communicate with one another through data passing or coordinate activity. Service consumer, request a service from the service provider and the services provider returns back with response message to the service consumer. A service provider can also be a service consumer. Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.(The NIST Definition of Cloud Computing) . It incorporates Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). SOCCI is the first technical standard for cloud formulated by the open group. Recent analysis by Uptime Institute Mckinsey consultancy show case that on an average only 6% of the server is utilized [4]. Most of the organizations are unaware of what application runs on their server. SOCCI focus enterprise architecture from the point of view of cloud computing.

II. SOCCI

Infrastructure is the main cost involved in the start up of an enterprise. It is also the base of an organization. Cloud computing needs a change in the IT infrastructure and management thereof. Cloud computing offers an abstraction of a server, file system, storage, network, database, etc. Moreover, increasing providers' profitability and maximizing the utilization of

resources requires multi-tenancy, dynamic allocation of resources, and metering with charge-back. "Cloud Computing" refers to on-demand delivery of IT resources and applications via the Internet with pay on demand pricing. With cloud computing, no need to make large investments at the start of an enterprise for hardware or spend a lot of time on managing complicated hardware [3]. Advantages of Cloud Computing are: Benefit from massive economies of scale, Establish enterprise with less cost at start up, Scalable capacity, Leave the expertise to the experts. Data centres take care of the storage.

Cloud computing should be implemented efficiently. To provide organized implementation of any service on the cloud it required to follow a framework. Open Source platform has provided two such framework: Service Oriented Architecture (SOA)[9] and Service Oriented Cloud Computing Infrastructure (SOCCI) [6][11]. This paper aims at studying the possible implementation of SOA and SOCCI in Hewlett Packard.

III.SOA – CASE STUDY OF HP

The Service Oriented Architecture (SOA) framework [1][5] enables the understanding any business as list of services. For Hewlett Packard (HP) has many customers, one such customer is ING bank. This analysis done to study the probable SOA framework used by HP. Especially how it provides Infrastructure service to ING Bank. SOA helps in converting a legacy business application into a service oriented application [2]. The layers that are present in SOA are:

A. Consumer Layer Interface:

ING bank has different consumer user interface. The website which allows the user to login through browser and access their account. ING bank also has mobile application that allows the clients on the move to use portable device for accessing bank service.

B. Business Process Layer:

The business uses cases in terms of the application. The business use cases that would be considered for ING bank would be:

1) *Transaction processing:* This involves the day to day processing of client account such as money withdraw, deposit money, checking balance.
2) *Loan Management:* This involves interest rate calculation, capability of the customer with regard to loan. Preclosure of Loans.
3) *Credit card account:* The credit details, Interest rate calculation for credit cards.
4) *Customer portfolio:* Login Details. Personal details for customer mining

C. Service Component:

The components are used to build the services, like functional and technical libraries, technological interfaces etc. The service components for

1) *Transfer money*: This component can be used to transfer money between accounts, withdraw money.
2) *Analytical processing:* This components can perform risk management, client credibility
3) Security: This components involve customer login details, OTP password, Magnetic strip decoding.
4) Customer Details: This component requires the storage of customer information.

From SOA framework we are aware that banking can be implemented as a Service-oriented enterprise. This enterprise architecture can shifted to the cloud by putting all the services on the cloud.

IV. SOCCI HP CASE STUDY

The SOCCI architecture has four viewpoints[10]. This section explains SOCCI view points for Hewelett Packard.

A. *Cloud Service Consumer view point:*

Hewlett Packard (HP) provides cloud services to Dreamworks SKG, BT Engage IT, Digital Planet, ING bank through HP helion cloud computing infrastructure. From the customer point of view they expect the following from the HP cloud: SOCCI allow customers access new platforms and application rapidly, increased performance and availability, faster service access rate, security of data in cloud, reduce hardware procurement decrease time to market and easy deployment of business and scalability of infrastructure service.

B. *Cloud Service Provider viewpoint:*

From the viewpoint of the provider what does Hp expects to accomplish in Hp Helion: easy management of server and storage platform, easy delivery of on-demand cloud services, The infrastructure or server should be versatile to support all types of customer, Tracking of the free space available in the server, Knowledge about the new technologies that could be needed by the client, Security features should be implemented to avoid customers from accessing other cloud area.

C. *Cloud Services Developer viewpoint:*

Developer leverages to develop a set of services which are compatible in all environments

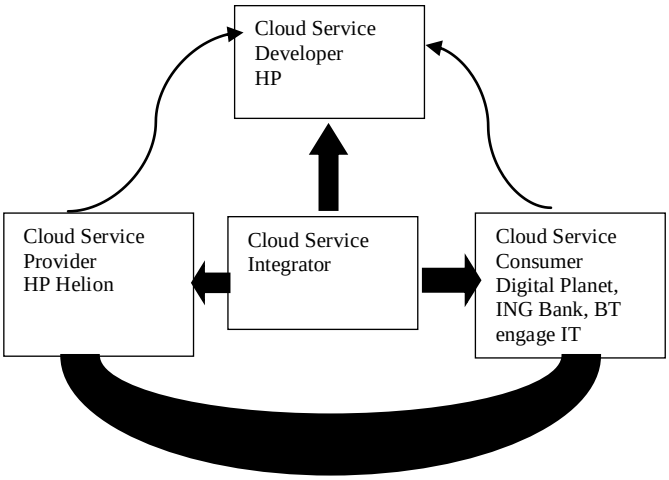

Fig. 1 Simulation of HP cloud computing

D. Cloud Service Integrator viewpoint:

Integrator refers to a person who integrates the services to customer in such a way that it transparent to the receiving entity. An integrator can use different technologies to provide the infrastructure service needed by ING bank. When the bank needs more processors HP should be able to provide it without ado.

E. Governance in Cloud:

Continuous cloud governance is required by the HP helion for the following reasons: Check whether the service implementation and execution time is in par with the competitors, check for the Evolution in technology, methods to cope up with recent trend in infrastructure, the HP Helion provides governance for itself and also as a service, HP universal search has access and analyse data archived in HP consolidated archive (HPCA), for improved productivity and knowledge management. HPCA also now features enhanced integration

with HP worksite – WorkSite now reconciles email stubs from HPCA to complete the electronic file, which enhances search and compliance.

From SOCCI terminology analysis it is possible to understand that security is not a very strong point of cloud computing. So security is not implemented in the cloud. The services that will be included in the cloud

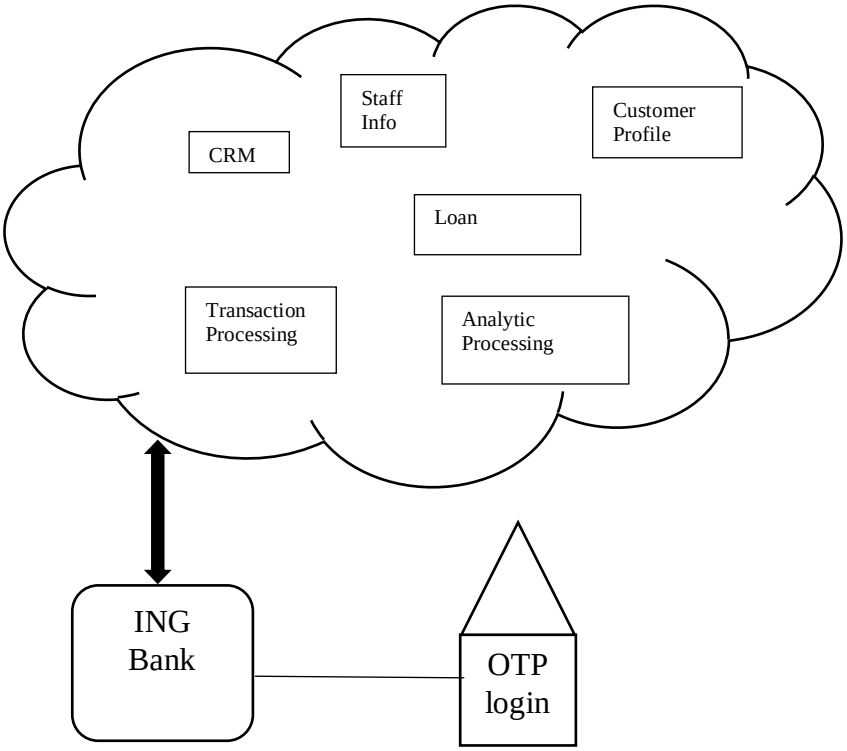

Fig. 1 Simulation of ING Bank on the cloud

HP is one of the contributor to SOCCI framework. HP is a important competitor in the field of infrastructure as a service. So it has contributed to the development of a standard framework for Service oriented enterprise architecture framework for cloud computing. This would enable them to provide a standard architecture for their cloud service and make the customer easy to understand the model. It also provides a clear cut definition onto what services would be placed on the cloud and what other services would be placed in house. This provides improved security, customer satisfaction[13].

V. CONCLUSIONS

SOCCI framework allows the Cloud providers to follow a systematic way in providing service to the cloud consumers; such that the cloud is used efficiently. To understand this HP cloud is taken as a case study. First case study attempts to study the HP possible implementation of ING Bank with SOA framework and the same using SOCCI [7]. When the cloud is implemented using SOCCI framework then there would be a clear understanding on what services can be implemented on the cloud and which is better to keep on the client server. From the analysis it is understood that Security and login details on the consumer server is a better model, than implementing all services on the cloud[12].

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