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AN ENTERPRISE ORIENTED VIEW ON THE CLOUD INTEGRATION APPROACHES – HYBRID CLOUD AND BIG DATA

Shanmugasundaram Palanimalai\textsuperscript{a}, Dr.Ilango Paramasivam\textsuperscript{b*}

\textsuperscript{a}School of Computer Science & Engineering, Bharathiar University, Coimbatore, India
\textsuperscript{b}School of Computing Science & Engineering, VIT University, Vellore, India

Abstract

With the recent increase of SaaS providers in the market, enterprises are having difficulties in choosing their right organization’s architecture. Subsequently data that exists outside the organization firewall needs to be managed and controlled. In spite of that, there are additional difficulties by BYOD (Bring Your Own Device) polices i.e. within the organization’s firewall, when employees want to access the data using any device from anywhere. As a result, IT is now undergoing a major shift in demanding a new architecture, which will have the ability to integrate anything and anywhere. In order to get the seamless connectivity, between the systems and services across the enterprise, and also achieve the benefits of cloud computing, organizations are revolting to build an effective cloud integration strategy. It entails IT organizations to think about various aspects while choosing an organized approach for their application integration, data integration and process integration. The aim of this paper is to present the various cloud integration challenges, key aspects while choosing Integration solutions, and suggest a Hybrid Integration Architecture for various IT aspects to make the integration process much easier. We also present the benefits of handling Big data in Hybrid Cloud environment.

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* Corresponding author. Tel.: +91-978-934-5005.
E-mail address: Shan.Palanimalai@yahoo.com
1. Introduction

Cloud Integration is the process of configuring various application programs to access and share data in cloud. The Cloud based integration is known as iPaaS i.e. Integration Platform as a Service. While the SaaS applications are quick to point out the benefits such as better flexibility and lower costs, enterprise leaders have recognized integration is one of the major problems in successfully adopting & deploying SaaS and other web applications.

As per the latest survey carried out by Saugatuck Technology, 32% of the respondents mentioned that, the integration between the SaaS and the legacy applications (On-Premises) is the top concern for the enterprises. Secondly, with 39% of the respondents reported that Data security and privacy. The adoption of other cloud computing models such as Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) are growing due to the popularity of social-media platforms and mobile applications. This creates additional data which needs to be processed outside of the organization’s firewall and into the cloud. Therefore, with the emerging trends and technologies, the enterprise leaders should think about effective integration strategies for their applications to talk each other with-in the cloud and also between the cloud and enterprise.

1.1. Challenges and Key Considerations while choosing Cloud Integration Solutions

In below, we present the various cloud integration challenges and the key considerations while choosing Cloud Integration Solutions.

- **Security:** Security continues to be an obstacle for the cloud users and it also provides complication in the integration. Thus we should ensure that, the cloud integration solutions should be capable enough to authenticate and authorize the access to resources, together in the cloud also in on-premises. In addition to that, the integration solutions should also be capable of encrypting and storing the data, which comply with the various regulations such as SSAE 16. There is a high increase in the SaaS applications, social-media platforms and mobile applications, thus, while these services access the data, there must be a secure way of connecting the cloud to the organization without giving up the firewall.

- **Scalability and Elasticity:** Perhaps, the point to point integration-solutions, can bring the basic SaaS-to-SaaS connectivity, however, it may not be flexible as much, when we are in a need to handle complex scenarios. So the Integration solutions should be capable enough to support various integration flows which move in both directions i.e. across the cloud and the organizations.

- **Monitoring and Management:** Cloud providers take the burden of upgrading and maintaining the SaaS applications. It provides significant benefit to the enterprise users however; the users have less control and visibility on their SaaS application especially on the integration stand point. So we must consider good monitoring capabilities while choosing, cloud integration solution i.e. it should provide enough control &visibility control on the performance attributes and the information flows, which are lacking currently in the SaaS applications.

2. Related Work

In spite of various challenges in the Cloud integration, there are newer emerging solutions mounting to overcome the integrations issues. iPaaS is a standalone platform which provides a suit of cloud integration services. iPaaS solutions bring-out a wide range of integration patterns i.e. not just point-to-point integrations solutions with secured way of accessing the enterprise data. As a cloud based solution, iPaaS also shares the scalability and flexibility of the other cloud-services, the most important part is iPaaS works as a “central-point of interaction” for various services & applications across the enterprise and cloud.

In this perspective, we have fairly evaluated multiple cloud integration research reports and survey results to suggest organizations to choose an effective cloud integration strategy. We also present various iPaaS–deployment scenarios & propose a Hybrid Integration Platform for various IT aspects to make integration process much simple and easier.
2.1. iPaaS Integration Platform as a Service (iPaaS)

An iPaaS is a set of Cloud Integration services, which provides elastically scalable and multi-talented platform in the cloud to support various cloud integration situations i.e. Cloud to On-Premises, Cloud to Cloud, On-premises to On-premises and eCommerce B2B Integration. It delivers integration services & governance in any combination of on-premises and off-premises applications, Service Oriented Architecture (SOA) & cloud services, and processes data within or outside organizations. The below figure illustrates the various iPaaS deployment Scenarios.

2.2. Cloud Based Connectors

Cloud based connectors provide an easier way to connect the SaaS applications to existing legacy applications. It also supports in integrating endless range of APIs as needed for the business applications. Multiple vendors provide ESB (Enterprise Service Bus) as a middleware solution to manage the access to applications, services and interfaces. ESB enables connecting the SaaS platform to existing legacy applications with much simpler way.

3. Hybrid Integration

Hybrid Integration leverages, the Enterprise Service Bus (ESB) and Cloud based integration(CBI) technology i.e. similar to an iPaaS solution that supports the execution of applications that manages cloud and on-premises. It allows the on-premises applications to faultlessly integrate with cloud-based applications. As cloud integration, pushes the data outside the enterprise’s firewall, Business are more worried about the sensitive data that is being stored, in the cloud, nevertheless, with the hybrid integration the sensitive data continues to be maintained in on-premises and the insensitive data is moved to the cloud.

3.1. Hybrid Integration Architecture

In below, we propose a Hybrid Integration Architecture for various IT aspects. This model allows on-premises applications to faultlessly integrate with cloud-based applications. Businesses need to connect with their existing custom & packaged solutions and make a single platform for their new services. It has cloud based integration and the ESB service, which allow the businesses to connect their customized existing application to new services in the cloud. Significantly, this hybrid integration model delivers a secure gateway for data for secured communications between CBI (Cloud based Integration) and ESB services.
Fig. 2. Hybrid Integration Outline

Fig. 3. Hybrid Integration Platform for various IT aspects
3.2. Hybrid Integration Capabilities

The hybrid integration capabilities should include:
- Seamless Integration
- Ease of Use and Agility
- Elasticity
- Complete Platform Extension

![Hybrid Integration Platform Capabilities (Source – Forrester’s Report)](image)

4. Handling Big Data in Hybrid Cloud

Hybrid cloud provides an optimum environment to store and manage the high volume of data in the cloud. The combination of the dedicated private & public cloud delivers an enhanced security, better performance and cost saving for businesses dealing with Big data.

With Hybrid cloud and Big data, Security is definitely paramount. Regardless of the data type of data, i.e. Customer personal data, Financial information or Social network data. Several hybrid clouds delivers security by offering, many security services as we get in the traditional dedicated-environment. Examples: Web Application Firewall (WAF), File Integrity Monitoring (FIM), Intrusion Prevention System (IPS) etc. These security services create layer of protection.
As Big data is dynamic in terms of its volume and the variety of data, it requires an infrastructure which is elastic and flexible in nature. Hybrid cloud offers an ideal solution to add extra resources and avoid downtime on the workload performance.

Fig. 5.: Big data Benefits in Hybrid Cloud

5. Recommendation and Conclusion

Based on the evaluation and research reports, we recommend that, organizations can consider iPaaS first to support integration & governance such as eCommerce B2B integration and Cloud services integration. Midsize organizations will support iPaaS first, and large organizations will look at iPaaS as an alternate approach to the conventional application infrastructures. Additionally, Hybrid cloud provides an optimum environment to store and manage the Big data in the cloud. The combination of the dedicated private & public cloud delivers an enhanced security, better performance and cost saving for businesses dealing with Big data. It is essential for each enterprise to focus in depth on the cloud integration strategies, because at some point of time each enterprise would have a situation to get in here. The advent of emerging cloud technologies, have brought costs benefits and time-to-time market advantages for different types of applications in the enterprises. However, there are problems in managing legacy applications, also issues related to security & governance. Most of the organizations are focusing on to hybrid-integration paradigms with an aim to leverage the benefits of cloud integration and also upholding the existing infrastructures.

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