

# A Comparative Study of Traditional Cloud Service Providers and Cloud Service Brokers

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## **Abstract: -**

**Cloud Computing is like a ray of sunshine for a business that needs to increase information technology capacity or capabilities quickly without being swamp down by the expense of buying new infrastructure, licensing software, and training staff. But choosing a cloud computing vendor, from thousands of options can be complex. There are some key factors organization needs to consider before selecting Cloud Service Providers. A cloud broker acts as an intermediary between various service providers and the cloud users. Any requests from the users will be processed by the cloud broker and the services are allocated to the user according to their requirements. This paper identifies differences between Traditional Cloud Service Providers and Cloud Service Brokers.**

**Keywords – Cloud Computing, Cloud Service Broker, Comparison, Parameters, Traditional Cloud Services, SLA etc.**

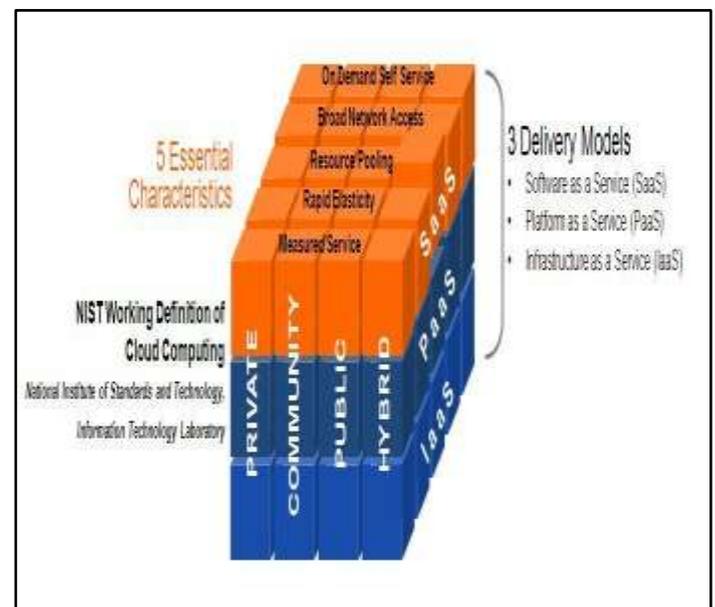
## **Objective:**

- To compare Traditional Cloud Service Providers and Cloud Service Brokers
- To identify deciding parameters for selecting traditional Cloud Service Providers or Cloud Service Brokers

## **Introduction:**

IT needs are as varied as the workloads a business supports. Some workloads are relatively static in their computing resource needs; others fluctuate by time of day, month, or year; and still others are simply unpredictable. This has led to the evolution of Cloud Computing which is one of the major advances in the history of computing.

The facets of industries are moving towards the concept of availability of everything online. Understanding this trend, the big and giant web based companies like Google, Amazon, and Salesforce came with a model named “Cloud Computing”. According to the definition by NIST, “Cloud Computing is a model for on-demand network access to a shared pool of configurable computing resources 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;



**Fig 1: - Cloud Computing Characteristics, Service and Deployment Models (As defined by NIST)**

## **Cloud Service Models:-**

1. **Software as a Service (SaaS):** Under this model the software is deployed as a hosted service delivered over

the internet, typically using a subscription fees based on usage. The customer uses product as a 'service on demand' and pays on the usage. The target audience of SaaS could be enterprise looking to gain efficiencies by standardizing certain functions like Payroll and Customer Relationship Management (CRM) on a common software platform that can be provided as needed.

**Major SaaS Service Providers:** - Google Apps, Office Web Apps, Salesforce, Workday etc.

- 2. Platform as a Service (PaaS):** Computing platform that enables the development and deployment of applications without costs of purchasing, installing and managing the supporting hardware and software systems. Normally PaaS is used by the developers who do not have resource to build and manage their own data centers and the developers working on web applications.

**Major PaaS Service Providers:** - Citrix, EngineYard, Microsoft Azure, WaveMaker etc.

- 3. Infrastructure as a Service (IaaS):** Infrastructure is delivered as a utility over the internet, creating a shared pool of resources that can be allocated to any application as needed by the enterprise. The companies that do not want to be in business of managing hardware could be targeted by IaaS.

**Major IaaS Service Providers:** - Amazon web services, HP, IBM, Rackspace etc.

#### Cloud Deployment Models:

- 1. Public Cloud:** It is available to the public or large industry group and is owned by an organization providing cloud services.

- 2. Private Cloud:** It is cloud operated solely for an organization. It can be managed by the organization or a third party and can exist on or off premises of an organization.

- 3. Community Cloud:** It is a cloud that is shared by several organizations and supports a specific community purpose (e.g. mission, security requirements, policy and compliance). It can be managed by either an organization or a third party and can be on or off premises of the community organizations.

- 4. Hybrid Cloud:** It is a composition of two or more clouds that remain unique entities but are bound by standardized or proprietary technology that enables data and application portability.

The above mentioned services can be provided by Cloud Service Providers. A cloud provider is a company that offers above mentioned service of cloud computing to other businesses or individuals. Cloud providers are sometimes referred to as cloud service providers or CSPs.

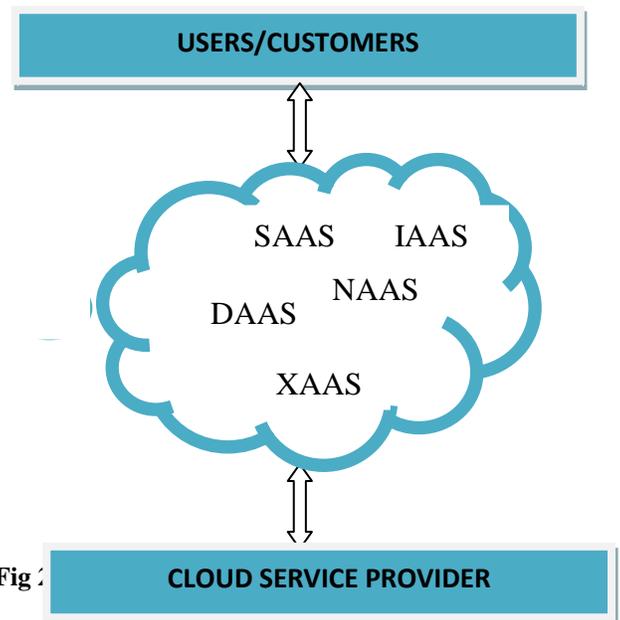


Fig :

Cloud providers deliver cloud solutions through on-demand, pay-as-you-go systems as a service to customers and end users. Cloud provider customers access cloud resources through Internet and programmatic access and are only billed for resources and services used according to a subscribed billing method. Depending on the business model, a cloud provider may provide various solutions. There are a number of things to think about before evaluating cloud service providers.

#### Research Methodology:-

This paper compares Cloud Service Providers and Cloud Brokers. The said research uses secondary data wherein various Cloud Providers and Cloud Brokers and their impact on service has been studied in detail.

The Secondary Data has been collected from journals, blogs, articles, whitepapers and websites of the organization for the study, wherein analysis has been done by studying pros and cons of both the services.

### Choosing Cloud Services that work as per business needs

Cloud computing already has a profound impact on the way IT being used in Enterprises today. In many cases, cloud is proving to be a disruptive force. Smart CIOs and next-gen Systems Integrators are leveraging this disruption to get cloud service as per business requirements. But harnessing cloud computing is not easy. Consumers struggle with composing IT solutions from XaaS components, navigating a confusing array of cloud services providers, complex design, provisioning of cloud architectures, manual service composition management etc. There can be other sets of difficulties listed below which consumer can face while selecting suitable Cloud Service;

- Identify the business requirements for the cloud-based solution. This seems obvious, but many organizations are using the cloud without knowing it.
- Determine the cloud service needs based on the business requirements. Some applications might be more business critical than others.
- Develop scenarios to understand the benefits and risk, using these to determine the requirements for controls and questions to be answered, may lead to the conclusion that moving to the cloud is not appropriate.
- Understand what the certification and accreditations offered by the cloud provider mean and actually cover, and how these support your needs.
- In most organizations, cloud computing may co-exist with other IT service delivery models, so an approach to governance and management is needed which covers both traditional and cloud models.
- Drawing out clear and concise SLAs or Service Level Agreements is the norm for all types of traditional IT services; it helps increase productivity and performance of the provider in the long run. However, this is not quite the case when it comes to cloud-based software. It cannot be as flexible and customizable as regular SLAs and is subject to different requirements and specifications. The IT sector in any enterprise, therefore, needs to understand the working of the cloud-based environment and then reorient itself to a different perspective of thought and functioning with this aspect of business. This is difficult task for non IT organization as they need to be fully dependent on the decision taken by their cloud analyst.
- Vendor lock-in has been a constant presence in the technology industry for years and this is still the case

with cloud computing. The risks associated with cloud providers include loss of governance, data privacy issues and return of customer data. Mature business processes are often subject to regulations and laws, and organizations have invested heavily in IT to ensure compliance control to the cloud service provider, and it is essential to have independent confirmation that the provider will comply with the regulatory requirements.

The provider also has control of the business data held by the service. Contracts need to specify how this data will be returned in a useable form at termination of contract to allow business continuity and provide flexibility to switch provider.

Also, many traditional IT services providers are struggling to define their path in cloud services, as they face challenges in delivery, growth and profitability, without undoing their core business, which has been immensely successful and profitable.

Thus when moving to the cloud it is important that the business requirements for the move are understood and that the cloud services and deployment models are selected to meet these needs, the key to safely embrace the cloud is to get Cloud services as per business requirements. Also the process of selecting one or many cloud provider(s) from a multitude of options is not easy. Providers allocate and provision resources differently, leading to more confusion and little performance information for users to compare. Realizing this concern, concept of Cloud Broker came into existence.

### Cloud Broker

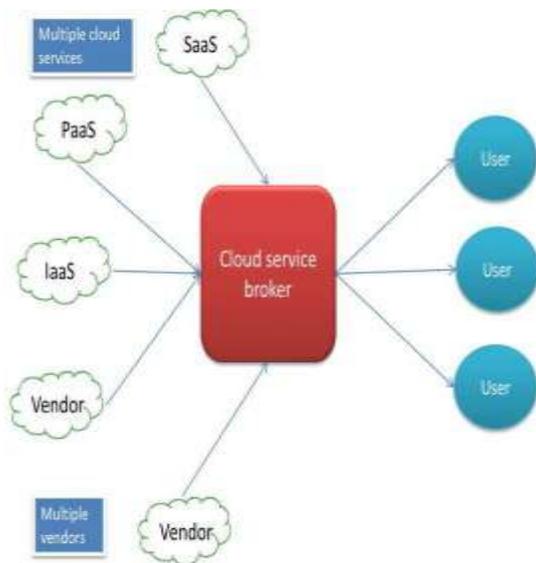
[National Institute of Standards and Technology \(NIST\)](#) in the US described cloud broker as “an entity that manages the use, performance and delivery of cloud services, and negotiates relationships between cloud providers and cloud consumers.”

According to NIST, several service areas can be supported by the cloud broker including:

- **Service aggregation:** The cloud broker combines and integrates multiple existing services into new service, carrying responsibility of data integration between cloud consumer and cloud providers.
- **Service intermediation:** A cloud broker provides value-added service, enhancing an existing service by improving some of its capabilities.
- **Service arbitrage:** This is similar to service aggregation but with flexible dynamic choice of service providers based on the broker’s internal evaluations.

- Governance:** The broker ensures that the cloud service provider treats the data in accordance with regulations and policies, and that security practices are followed

A cloud service broker sits in layer above cloud providers, adds value, and reduces complexities and risks to enhance cloud computing adoption. A single enterprise might use Google Apps for email, Salesforce.com for sales and lead management



**Fig 3:- Cloud Service Broker**

Although the relationship management side of purchasing cloud services will remain relatively the same as traditional IT purchases, the CSB model will lessen the need for high-trust relationship-intensive models when it comes to contracting with all the individual cloud service providers that customers choose to work with.

Gartner Inc. predicts that by 2015, most cloud computing customers will rely on a cloud broker to handle a diverse range of services, from discounted pricing to custom application monitoring. But there are major differences between “cloud services brokerage” and traditional cloud service providers, few of them are listed below;

Parameters	Traditional Service Providers	Cloud Broker
Entitle	They cannot rely on	Cloud brokers can

and Amazon Web Services for platform services. A cloud broker makes it easier for each of these providers to deliver value to their customers while also enabling the customer to coordinate these services.

The customer may hire a broker at the beginning of a project and pay the broker an hourly fee for their time.

ment	per-module licensing models and software audits, to ensure customers are using only the modules and functions for which they pay.	provide real-time usage tracking, as well as the dynamic creation, revision and deployment of multiple pricing models, based upon which features particular users access
Analytics	Analyzing from large number of complex services, to improve the business often requires customers to compare among various service providers.	A cloud-based analytics solution from a broker could significantly analyze from different vendors as per customer needs.
Billing and Payment	Using multiple products from multiple vendors can typically lead to a annoyance; having multiple bills to pay and numerous companies to check up on	A cloud services brokerage provides customer with the benefit of getting the best from multiple vendors, but only paying one bill, and dealing with one helpdesk that knows each and every service organization use.
Security	Given that there are a host of new laws requiring businesses to protect personal information of organization, customer cannot assure that cloud provider will abide by those same laws and help protect their data. Customers' needs to	Brokers can manage security concerns and negotiate with managed security providers for both cloud providers and their customer, thereby reducing security risks – taking care of authentication,

	check information about a provider's security practices and certification, which is very time consuming and complicated task	authorization and access control
Customization	Cloud providers offer so many services from so many places that they have little, if any, hope of managing everything for individual customer	A cloud broker often customizes cloud services for individual customers as their business needs.
Time	Evaluation of different cloud providers, their services and models suitable for the business from number of different providers in market is time consuming.	The broker's role may simply be to save the purchaser time by researching services from different vendors and providing the customer with information about how to use cloud services to support business goals.
Availability	There is no single point of contact in case of any failure or query, if service is taken from different vendors	A cloud services brokerage typically provides 24/7 support. There is just one person to call no matter what the issue, from data restoration or email or security issues and hosted telephony service changes.
Customer Service	Additional service is not provided by all the vendors.	In addition to acting as an intermediary for contract negotiations, a cloud broker might also provide the customer with additional services, facilitating the reduplication, encryption and transfer of the customer's data to the cloud and assisting

		with data lifecycle management (DLM)
Focus on business model	Organization's need to have different IT representatives to take decisions regarding adopting cloud services in concern with other management representatives	Putting IT issues in the hands of a trusted cloud services brokerage means organization do not have to worry about issues with implementation or operation, instead organization can focus on their core business
Integration	Traditional SIs, ISVs and aggregators control more often than intermediate	Brokers intermediate rather than control
SLA	Separate Service Level Agreement needs to be done for different service providers, for which organization needs to hire experts.	A clear SLA indicates the reward and penalty policies of a service provision. The broker can ensure that each item in an SLA corresponds to a Key Performance Indicator (KPI) that specifies the customer service within an internal organization.  The Broker can monitor services according to Service Level Objectives (SLO) specified in the SLA. Moreover, the precise contract helps parties to resolve conflicts more easily
Complexity	Application program interfaces are different for different vendors, which increases complexity for user	The broker may provide the customer with an application program interface and user interface that hides any complexity and

		allows the customer to work with their cloud services as if they were being purchased from a single vendor
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**Table 1 : Comparison between Traditional Cloud Service Providers and Cloud Service Broker**

### Findings of the study

Organizations today are looking toward the cloud as a means to better manage, secure, and support their IT infrastructure. But a move to the cloud is not as simple as eliminating organization's physical network infrastructure and software and moving everything to a hosting company. It is essential to review all the options before deciding on whether to go for cloud service brokerage or continue to use traditional cloud providers.

### Advantages of using Cloud Brokers

- Normalize multiple cloud services available on the market by integrating outputs from multiple cloud service providers
- Get better discounts and access more information from cloud providers
- Select the best cloud provider for specified requirements
- Provide additional approval workflow functionality, enhanced control, compliance, and security
- Helping users determine the best framework for each individual need, based on a number of factors. This can include provisioning assistance and budget guidance, as well as identifying how to select and integrate disparate services across multiple hybrid approaches.
- Cost-effective resources and infrastructure advantages, including the ability to negotiate technical contracts on-the-fly, delivering the high levels of flexibility businesses are now demanding.
- Enhanced security, allowing organizations to develop a customized solution that balances cost benefits with key security concerns.
- Assurance that upgrade, repair, and maintenance activities are performed in a non-disruptive fashion.
- The fear of losing control over data management is among the reasons for hesitancy about cloud services, but a good broker can help users identify their ideal

level of management oversight, and implement a cloud service to meet those needs. The user will still know what the broker is doing, and an administrator can set the policies to help ease these concerns.

### Disadvantage of using Cloud Brokers

- The cloud brokerage cannot modify the actual service implementation or own the technology
- In traditional IT service scenarios, the System Integrator usually has access to, and sometimes complete control over, the technology within the provider solutions that they are delivering. The potential removal of that control places different burdens on the integration brokerage, which has to integrate or aggregate services it has little ability to change.
- Cloud contracts will typically involve multiple companies that are given assurances only through the contract that may rely on outcomes to manage. In other words, a cloud integration brokerage must integrate services where the only guarantee of performance or availability is through the established SLA agreed on in the customer contract or the brokerage agreement.
- In the cloud, the added restriction makes it much more difficult to get detailed information about the system underlying the services being integrated, which can cause significant risk for Cloud Brokers.
- Establishing who is to blame for a problem is an extraordinary challenge for customers and brokerages alike. It is critical that CSBs keep their focus on demand/experience fulfillment, and responsiveness to incidents/issues to ensure that the relationship is consistently supported by a positive experience.
- A broker providing more robust services, however, may charge the customer on a sliding scale, depending on what services the customer contracts for. A broker may also partner with one or more cloud service providers and take a small percentage of the cloud provider's profit as remuneration once the customer has arranged service.

The Giant Cloud Service Providers are also preferring Cloud Service Brokerage for different reasons, few of them are:-

### Accenture

An outsourcing and consultancy giant Accenture has been developing its own cloud brokerage platform, which will be

soon unveiled publicly. The Accenture Cloud Platform is made up of a mix of software and services.

Front and Center is a procurement portal that can be deployed internally or hosted in the cloud itself. This gives IT administrators, or perhaps even business users, a single screen through which they can buy services from Accenture's ecosystem of approved cloud providers.

They can also procure pre-built integrations – for example, from Salesforce.com to NetSuite – that are hosted on Accenture's infrastructure and paid for on a per-transaction basis.

And thirdly, they can buy pre-configured services from Accenture. For example, the “testing-as-a-service” offering allows customers to rent testing tools on a pay-per-use basis, and spin up cloud infrastructure as a testing environment, in one fell swoop. Best thing about this is All of this is paid for with a single monthly bill.

Accenture's Cloud Business Already at \$1 Billion-a-year aims to become Industry's Cloud Broker.<sup>1</sup>

### Google Apps

The Google Apps Reseller program started in 2009 with pilot group of 50 partners. This group was made up of early adopters and Google Apps evangelists.

Over the last five years, the program has grown immensely and is now comprised of thousands of partners around the world (the last quoted number is around 6,000, but we believe it to be much higher). These partners include companies that were founded solely to resell Google Apps and other Google products as well as value-added resellers (VARs) who previously specialized in legacy systems. VARs have realized that they must participate in the shift to the cloud or risk losing out on key business. While VARs and newcomers make up the majority of Google Apps resellers, huge organizations like HP, have also gotten into the game.

Today, many of the most successful Google Apps partners have expanded their businesses outside of Google Apps and now resell and provide consulting services for myriad other cloud R

### Cognizant

Cloud brokers can help traditional (Integrated Service Vendors) ISVs enter the SaaS market with services such as entitlements, analytics and security.

The robust infrastructure required to deliver SaaS requires a substantial investment by ISVs (Integrated Service Provider), and could lower margins, require changes in cash flow and pricing models, and mandate new forms of customer support. Faced with such challenges, ISVs might test the market with,

for example, a free version with limited features for a specific customer set. A cloud broker can reduce the cost and risk of such experimentation, helping the ISV embrace SaaS more easily, and as profitably as possible.

A cloud broker helps the ISV choose the platforms that best suit its needs, deploy and integrate applications across multiple clouds, and/or enable the ISV to move between cloud platforms. It can add value through vertical solutions marketed to specific industries, or through horizontal functions required across verticals such as entitlement, subscription management and billing. Well-qualified cloud brokers can ease the move to a profitable SaaS strategy with everything from strategic business consulting, to specific cloud-based services and tools.

### IBM

IBM, the global technology and innovation firm, cloud brokers play a vital role in its expansion plans to new geographies and customers, there is a growing demand for its cloud services which offers tremendous opportunities to the company. However, it would not be possible to reach out to the customers spread across geographies without cloud partners. They are important channels for our company. IBM has a big cloud ecosystem which is also called 'cloud brokers' in other parts of the world and it includes telcos, independent software vendors (ISVs), local partners and resellers. Such cloud partners or brokers source IBM's technology and infrastructure on the back-end and front-end to offer cloud services under white label.

Interestingly, IBM's cloud brokers are mostly telecommunication providers which offer infrastructure and platform as a service (IaaS and PaaS). “For telecom providers, its a natural extension of their business. On the top of IBM's platform, they can create or build a new layer to offer and reach out to customers and thus increase revenues.

### Conclusion

This study has found out certain deciding parameters which need to be considered before going to Traditional Cloud Service Providers and Cloud Service Brokers.

The study shows that the process of finding out cloud service provider as per business requirement is cumbersome task which can be eased by adopting cloud brokerage services.

However this does not suggest that cloud services brokerage can replace traditional cloud service providers. Instead traditional cloud service provider can adopt certain set of roles whenever they need to serve additional value to customer. However to endorse this study primary data will be needed.

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