A Methodology to Select the Best Public Cloud Service for Media Focussed Enterprises

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Abstract. With the advancement of cloud technologies, media focussed enterprises have started adopting cloud technologies to improve their offerings, to increase the reach and to gain competitive advantages. With the proliferation of public cloud services and the lack of standardisation in describing cloud services, it has become a very difficult task to identify the most suitable cloud service for an enterprise.

This paper discusses the methodologies that a media company can adopt while selecting a public cloud service to scientifically arrive at a purchasing decision. The model described herein has been successfully used by RightCloudz Technologies for their public cloud selection advisory services.

Keywords: Evaluation as a service · Compare clouds · Public cloud services for media companies · Public cloud selection

1 Introduction

There are three data center models that are commonly in use at most media focussed enterprises. Each of these models provide a different set of capabilities at varying degrees of efficiency[1].

(a) In-premise Data Center (Private or Outsourced to a Managed Services Provider)
(b) IaaS/PaaS/SaaS from Cloud Service Providers
(c) Hybrid model

This paper discusses a model and methodology that can readily be applied to compare Public IaaS/PaaS/SaaS services to be used by media focussed enterprises.

While working on this paper we looked into the challenges faced by media delivery companies, e.g., video-on-demand service providers, video conference service providers, news and publishing houses, etc. where the content is accessed through different types of devices and the peak load can not be easily anticipated. For example, a news item or a video clip may go viral for no apparent reason. Addressing the requirements of media production houses (viz. film/TV/animation/music industry) has been kept out of the scope of this paper.

[1] Efficiency has been defined as a function of timely completion of jobs with reduced average cost (one time cost, operating cost and both, as appropriate) for the resources.

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2 The Selection and Buying Processes in Vogue

Selecting a service provider by using the standard Request for Proposal (RFP) methodology is a well accepted method in the B2B sector. The RFP process generally works well in situations where the number of vendors to select from is small or the vendors are pre-selected/short-listed by using some other methodology prior to the RFP being released.

3 A Paradigm Shift in the Buying Process

The era of cloud technologies, which has enabled enterprises to buy business critical computing resources over the web, ironically has made it easier to skip the required due diligence while buying computing resources in hurry.

With publicly available data and the data validated by 3rd parties about the quality of services offered by a cloud service provider, many enterprises may prefer to do online evaluation of cloud services before purchasing.

In the following sections we shall see how the commonly used techniques to select a potential cloud service provider, may actually push the enterprises towards settling down with a less than the best option available.

3.1 The Shortcomings of a Filter Based System

There are a few online services that help cloud customers identify the most suitable cloud service for their business. Most of these services let the customer narrow down the cloud vendor list based on simple feature filtering; e.g., if two vendors support SSD as a storage option, both will get shortlisted if the customer's application requires SSD type of storage. This kind of filtering mechanism does not provide an assessment of the quality of the services provided and therefore the customer still has the difficult task of picking the better of the two feature-equivalent services. Basically the filtering scheme does not rank Cloud Service Providers on the basis of the quality of the service provided. Also there is no way for the customer to specify relative priorities of the requirements.

3.2 The Shortcomings of Research Reports

Research reports and whitepapers are good sources to get overall information about cloud services provided by a set of Cloud Service Providers; some amount of company profile is available part of the report. However, these reports are static in nature and the data points used in them may not be very current – at best, the data points may be a couple of months or a quarter older than the time the report was prepared. Also, these reports are typically written for a large customer base and are not applicable to the specific business needs of a particular enterprise.

Even with above mentioned shortcomings, an independent and unbiased cloud comparison report may help a media company to (i) prepare the list of requirements, (ii) short-list a set of vendors (for the required service).

3.3 The Dynamic Component in Ranking

A rating or ranking system is incomplete if it does not consider dynamic data in the evaluation process. Dynamic data may include several important pieces of information about a service provider's SLA adherence, performance and latency information, etc.

A good evaluation system should use static data about features and capabilities (as claimed by the Cloud Service Provider) and dynamic data (averaged out over a reasonably long period) for objective analysis and ranking.

4 A Path Breaking Evaluation Methodology[2]

This paper describes a path breaking evaluation methodology. There are three key players in this methodology: (1) Cloud Service Providers, (2) Consumer/user of cloud services, (3) "Cloud Evaluation as a Service" Provider.

To evaluate a cloud service provider for a set of services a few filters are used to prepare a shortlist of Cloud Service Providers. A list of all essential features for the required service is prepared. This is the list against which the customer requirements are compared to see which requirement is satisfied by which feature. Measurable parameters for all features are then identified, and raw data (both static and dynamic) are collected. While a major part of the data can be collected through an automated process, review of those data and other manually collected data are done. Then a score is assigned based on these raw data. The data refresh frequency should generally not be longer than two weeks. The task of keeping data current is one of the most important mantra of "Cloud Evaluation as a Service" providers.

Following diagram shows the interactions among the consumer (enterprises), Evaluation-as-a-Service provider, cloud service providers and 3rd party sites keeping track of performance of Cloud Service Providers (CSPs) (Fig. 1).

4.1 Defining the Meaning of a Priority Value

Each requirement (aggregation of related features of the service) in this system is defined by measurable parameters. A priority value from 0 to 10 is assigned to each requirement, where 10 is the highest priority value - for a requirement would call for satisfying particular threshold value of a certain group of parameters. A higher priority value would mean that all threshold values for lowers priorities are also to be satisfied for that requirement.

[2] Patent pending; for more information please visit www.rightcloudz.com.

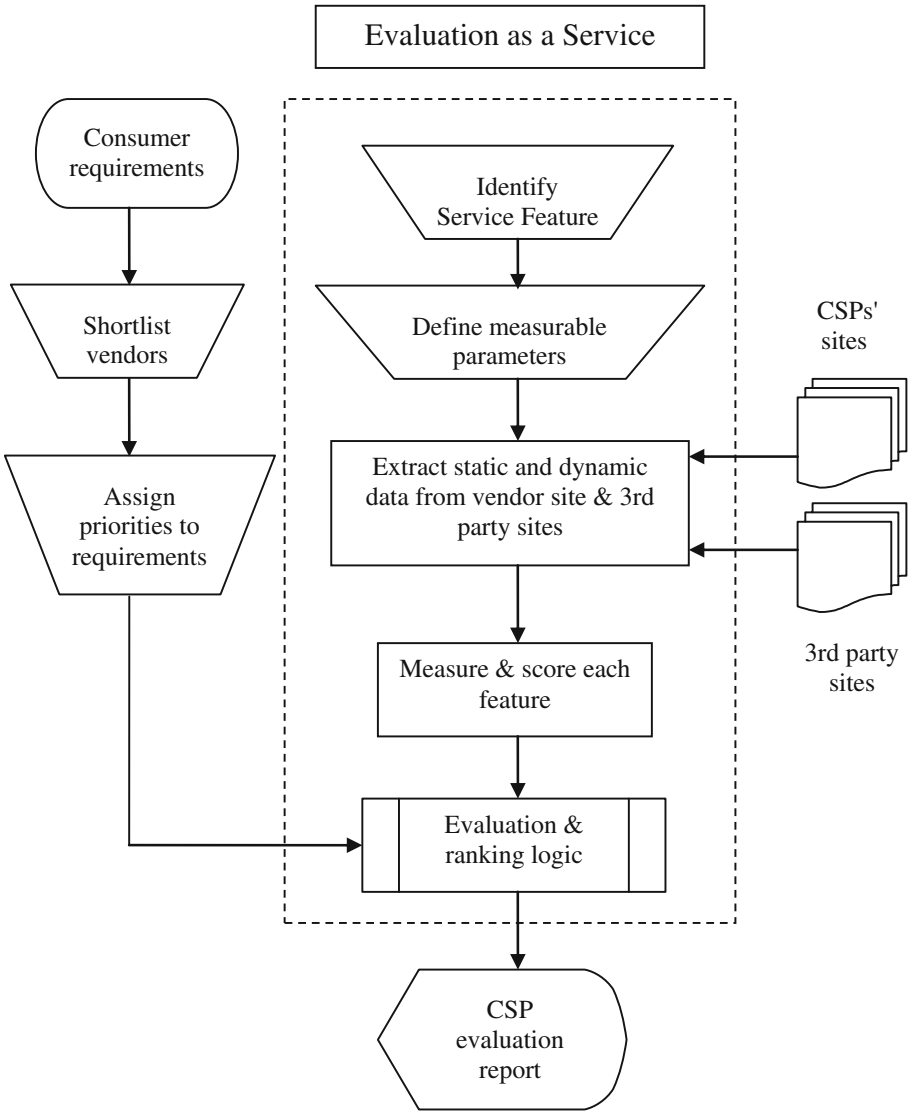

Fig. 1. Cloud Evaluation as a Service

By setting a priority value for a requirement, an enterprise communicates the importance of those parameters to be fulfilled. If a Cloud Service Provider does not fulfil one or more of those parameters, that will get a lesser score than the Cloud Service Provider which satisfies/does better for all those parameters.

The important points on assigning a priority value for a requirement by the customer are:

- The value for priorities are not absolute but rather a relative one with respect to other requirements.
- A priority value of zero means that the requirement has no value for the customer; e.g., media companies those who want to use transcoding as a service, may put a lower value for ease of use requirement.

4.2 Identifying Key Technology and Business Requirements ("Must Have") of Media Companies

Key requirements of media companies can broadly be grouped under following five kinds of services. One service may have dependency on/use part of services provided by another service.

(1) **Transcoding service** - both file based and streaming (for media companies providing video and audio services for a set of end-user-devices).
(2) **Network service** - ability to provision sufficient download bandwidth for satisfactory user experience.
(3) **Compute service** - the computing resource required to run transcoders and to meet the requirements of seasonal peaks.
(4) **Security service** - a secured channel for consumers to access subscribed services.
(5) **Storage service** - storage for accessing the media, on demand or in near future, and options for archival/cold storage of transcoded content/program.

4.3 Identifying Additional Technology and Business Requirements of Media Companies

While assessing cloud services, there are few common requirements which should also be satisfied for productivity and efficiency:

(6) **Operating cost** - cost of using various cloud infrastructure, support, data transfer, monitoring services and so on.
(7) **Ease of use** - how easy it is to use transcoding service and integrating those with the application.
(8) **Support** - kind and quality of support available to resolve any issue while using any of those cloud services.
(9) **SLA adherence** - how well the service level agreements for output transcoders, required bandwidth, etc. are provided.
(10) **Compliance** - Cloud Service Provider should have a clear policy and the ability to adhere to policies set by the government on streaming of video and other media.

The next step is to map each requirement to a group of measurable parameters which can be assigned a score. We shall discuss those in the coming sections.

4.4 Identifying Parameters Which Define Requirements

A requirement is best described by listing down the parameters which together give the meaning to that requirement. While some requirements may be defined by four to five parameters, other requirements may require ten parameters or more. As a thumb rule, a cloud usage scenario generally can be well defined with seventy to hundred quantifiable parameters spread across seven to fifteen requirements.

To illustrate the working of this model, we shall list down few parameters for the requirements identified above. For the sake of simplicity we have not listed all of the parameters for each requirement. One may want to add/remove one or more parameters and/or may have new requirements and parameters as required for his/her cloud usage scenario (Table 1).

Table 1. Measurable parameters for requirements of a Media Company

#	Requirements	Measurable parameters
1	Transcoding Service	(i) file based transcoding, (ii) max file size, (iii) stream transcoding, (iv) SDK support, (v) additional services to be used, etc.
2	Network Service	(i) bandwidth, (ii) baud rate, etc.
3	Compute Service	Compute resources: (i) memory, (ii) disk, (iii) vCPUs/cores, (iv) OS, (v) on demand/reserved instances, etc.
4	Security Service	(i) authentication and access control, (ii) configurable option when connected from multiple devices, (iii) encryption of sensitive data, etc.
5	Storage Service	(i) disk space, (ii) SSD, (iii) archival/cold storage, etc.
6	Operating cost	Cost of (i) compute, (ii) storage, (iii) network, (iv) transcoding (file/live) service, (v) support, (vi) data transfer, etc.
7	Ease of use	(i) how easy it is to integrate transcoding service, (ii) ease of using monitoring service, (iii) access to documentation, etc.
8	Support	(i) email/chat/phone based support, (ii) office hrs/24 h, (iii) account manager/escalation channel, etc.
9	SLA adherence	(i) unplanned downtime, (ii) time to restore services, etc.
10	Compliance	(i) certifications, (ii) tools to enforce policy, etc.

4.5 Setting Priorities for Each Requirement

Let us assume, following are the priorities set for each requirement. It is advisable to mark very important requirements with high priority value (>=8). It is better to assign high priority value to three to five requirements at maximum. The following table shows requirements (listed in alphabetical order) with assigned priority value (Table 2).

Table 2. Requirements with priority assigned

#	Requirement	Priority
1	Compliance	5
2	Compute	7
3	Ease of use	6
4	Network	9
5	Operating cost	6
6	Security	6
7	SLA adherence	7
8	Storage	8
9	Support	6
10	Transcoding	10

4.6 What to Look at to Zero in on a Cloud Service Provider

Once the scores for all parameters are available, these scores are normalized to bring them to comparable terms. Then these normalized scores for requirements are computed by weighted aggregation. One can decide either (i) to have equal weights for parameters of a requirement, or (ii) different weights for parameters of a requirement – this way the relative priorities of parameters within a requirement can be adjusted as per user needs.

Once the weighted normalized score of each requirement for the selected Cloud Service Providers is computed, we are ready to compare Cloud Service Providers against the requirements. The significance of comparing this way is equivalent to comparing an apple with an apple because the scores have been normalised at parameter level.

5 Vendor Scores and Sample Charts

To illustrate the concept we have used data of six cloud service providers/vendors for media companies; names of the companies have been masked intentionally and have been replaced by labels V1 through V6.

5.1 Top Vendors for User Assigned Priorities for Requirements

The chart and vendor scores with user assigned priorities are shown below (Fig. 2).

Looking at the total score, an enterprise may decide to choose cloud service provider V5 as that got the best overall score (Table 3).

5.2 Top Vendors for All Requirements with Equal Priorities

The chart below provides vendor ranking based on all relevant requirements but with all the priority levels set at the same level (10) (Fig. 3).

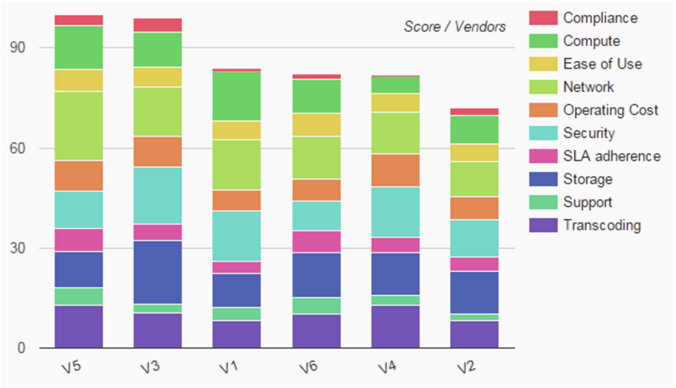

Fig. 2. Ranked Cloud Service Providers for user assigned priorities

Table 3. Scores of top five vendors with user assigned priorities for requirements

Requirement | Vendor	V5	V3	V1	V6	V4
Compliance	3.13	4.23	1.09	1.43	0.41
Compute	13.31	10.74	14.68	10.17	5.03
Ease of use	6.59	5.97	5.73	7.08	5.73
Network	20.69	14.52	15.18	12.90	12.31
Operating cost	9.38	9.46	6.16	6.60	10.13
Security	11.08	16.91	15.10	8.83	15.01
SLA adherence	6.98	5.01	3.77	6.38	4.48
Storage	10.81	19.12	10.03	13.75	12.81
Support	5.22	2.70	4.00	4.74	3.14
Transcoding	12.81	10.44	8.24	10.27	12.81
Total score	**100.00**	**99.10**	**83.98**	**82.15**	**81.86**

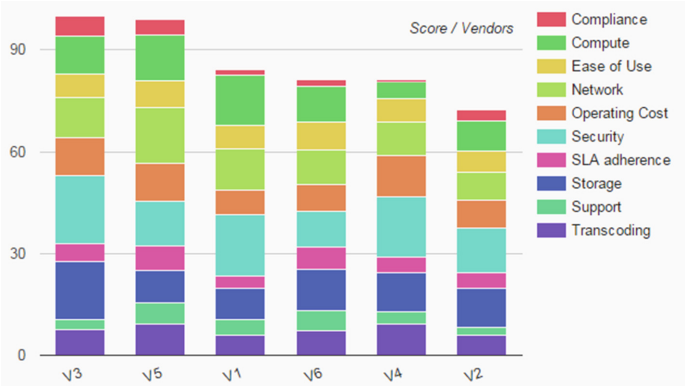

Fig. 3. Ranked Cloud Service Providers for equal priorities

Table 4. Scores of top five vendors with equal priorities for requirements

Requirement | Vendor	V3	V5	V1	V4	V6
Compliance	6.06	4.47	1.56	2.04	0.58
Compute	10.97	13.60	15.00	10.39	5.14
Ease of use	7.12	7.85	6.83	8.43	6.83
Network	11.53	16.44	12.06	10.25	9.78
Operating cost	11.27	11.18	7.35	7.86	12.07
Security	20.15	13.21	18.00	10.53	17.89
SLA adherence	5.12	7.14	3.85	6.51	4.58
Storage	17.09	9.66	8.96	12.29	11.45
Support	3.21	6.23	4.77	5.65	3.75
Transcoding	7.48	9.15	5.88	7.35	9.16
Total score =	**100.00**	**98.93**	**84.26**	**81.31**	**81.23**

It is important to note that when all requirements are considered to be of equal priority, cloud service provider V3 gets the best overall score, closely followed by cloud service provider V5 (Table 4).

In this particular illustration top two cloud service providers seem to have very close overall scores. However, for the given user priorities, cloud service provider V5 scores the best. Moreover, V5 scores better in two out of three high priority requirements as well (viz., Network and Transcoding services). So, cloud service provider V5 should ideally be selected by the enterprise.

6 Conclusion

Selecting a Cloud Service in a scientific manner is going to be as important if not more when compared with selecting data center servers or desktop machines for the enterprise. No two cloud platforms are identical. More over, the way the features are generally packaged by Cloud Service Providers makes it very difficult to do an apple to apple comparison.

One may tend to think that vendor lock-in is rare in cloud usage scenario. However, migrating back and forth and identifying the most suitable cloud service provider in that process is an expensive exercise. Also, the thought of using a cloud service which might have been used by many other enterprises successfully, even for a similar media business, may still turn out to be a bad idea if business priorities are different!

There is no shortcut to due diligence while selecting a cloud service provider for an enterprise. We believe that techniques described in this paper will definitely help media focussed enterprises in selecting the right Cloud Service Provider for their business. However this technique is not limited to selecting right media related service only. The technique is very flexible to help enterprises to make the right choice while selecting a Cloud Service Provider in any domain.