

NEBULA AND CLOUD COMPUTING – Analyzing All Aspects of Both Entities

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Abstract - "At present the current cloud services are provided on well provisioned platforms and infrastructures. Still, there are many classes of services for which the current cloud infrastructure may not fit well as few users do not need strong performance guarantees, some do not need that much fast speed and for some the money is too high. Some users may be constrained by the data movement cost as well. To fill up such needs, we are here proposing the idea of using distributed voluntary resources to form NEBULA, those donated by the end-user hosts.

We first talk about the needs of cloud services and the challenges in meeting these requirements in such voluntary clouds. We then present the solutions of such challenges and talk about the future prospective of nebula, how it can be modified and what more platforms can be added in nebula which can be proven useful for the users who are interested in using cloud services but are resisting due to rigid formats of present cloud services."

Key Words: Cloud Computing, Nebula, Downtime, Merchant Lock-in, Voluntary Resources

1. INTRODUCTION

In the cloud computing domain, a cloud signifies a service provider to a user that hides the details of actual location of the data from the user. Basically, cloud computing comprises of the storage abilities of the resources, which are well provisioned and having a well managed infrastructures.

Cloud services tend to fail into several categories such as the present cloud services provider (e.g., Amazon, IBM, Google, Microsoft) are having rigid cloud services plan which do not cover the number of users as many of the services provided by them are unusable by those users. Many users don't need high speed performance as their data is not that much big, many users are not having the need of such large storage and like this many things are their in which users find themselves uncomfortable in using the present cloud services.

There is also the notion of strong resource and/or performance guarantees between the cloud provider and the user, that ensures that the users can see what they are expecting. As the current cloud services should be proves ease to use for the users, but there are several classes in which they don't fit well.

In this paper we generally focus on the performance and reliability omitting the other topics of discussion, we basically scope upon the use voluntary resources in nebula as they proving to be more user friendly and fits in a lot of more things than the present cloud services, as they do not limit the users with their options of speed performance, or data movement cost as different users have different platforms for which they need cloud services as some users need it for storage purposes, some users need them for high performance and data security purposes. Hence, Nebula provides a platform where all type of users can comfortably make their choices and then choose the cloud services. As nebula uses voluntary resources, it opens a lot of gate of options for users to choose the cloud services which is fulfilling their needs as need of cloud services varies from user to user.

2. OBJECTIVES OF NEBULA

To solve the above challenges and problems faces by many users, we are proposing the notion of NEBULA which are more dispersed, less managed clouds, constructed and made using voluntary resources and which act as an alternative to present cloud services which ticks all boxes of needs for the users.

- **Adaptability:** - As Nebula uses various voluntary resources, there are many existing volunteer platforms which consist of millions of hosts and users providing a large amount of storage options. E.g. : Folding@home has approximately 250K hosts providing over 1 Petaflop, which is comparable to some of the fastest supercomputers in world at present.
- **Negligible cost of deployment:** - As nebula includes voluntary resources, they are basically available for free or for a very low cost. As the voluntary resources are idle resources already available in the system. They do not need any kind of additional hardware, maintenance, or energy cost.
- **Distribution:** - The nodes of the volunteer resources are distributed geographically on a large scale. This can be useful for better mapping of services which will further result into less cost of data movement as well as provide end-user-specific and context aware service deployment.

3. EXISTING SYSTEM

Most of us may be familiar with Cloud Technology. It is basically a medium through which we can access metered IT resources. A Cloud network is, in many ways different from the Internet:

- A Cloud has finite and well defined boundary.
- A Cloud Network is privately owned by different bodies and organizations.
- A Cloud provides Back-end processing capabilities whereas the Internet provides content-based IT resources.

Cloud networks can be broadly categorised into three main types:

3.1 Public Network

The Public Cloud Network is one that is owned by a third party Cloud provider. It provides metered IT resources to its customers at a cost or are commercialised through avenues such as advertisements. The third-party Cloud provider is solely responsible for the creation as well as maintenance of the Cloud and its resources.

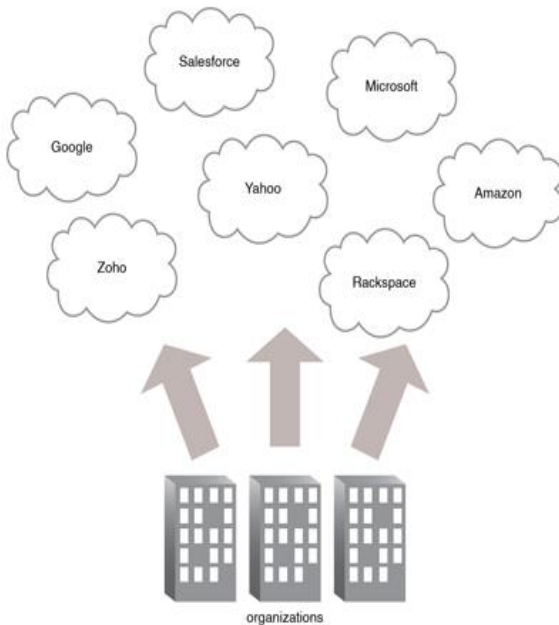


Fig-1: Public Cloud Distributors

3.2 Private Network

The Private Cloud Network is one that is owned and used by a single organisation. This organisation uses the Cloud for sharing metered IT resources within itself, i.e., various departments or offices of that particular organisation can access this Cloud Network. Thus, in a Private Cloud Network, both the Providers and the Consumers are part of the same Organisation or Body.

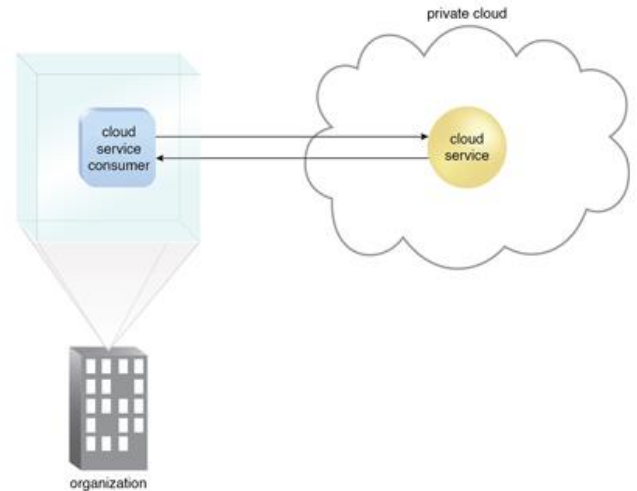


Fig-2: Private Cloud Distributors

3.3 Hybrid Network

The Hybrid Cloud Network is one that employs both-Private and Public-Cloud techniques. For instance, an organisation may use Private Cloud to access more sensitive data while it can use a Public Cloud for comparatively less sensitive data. These Cloud Networks are difficult to create and maintain due to disparity in Cloud environment.

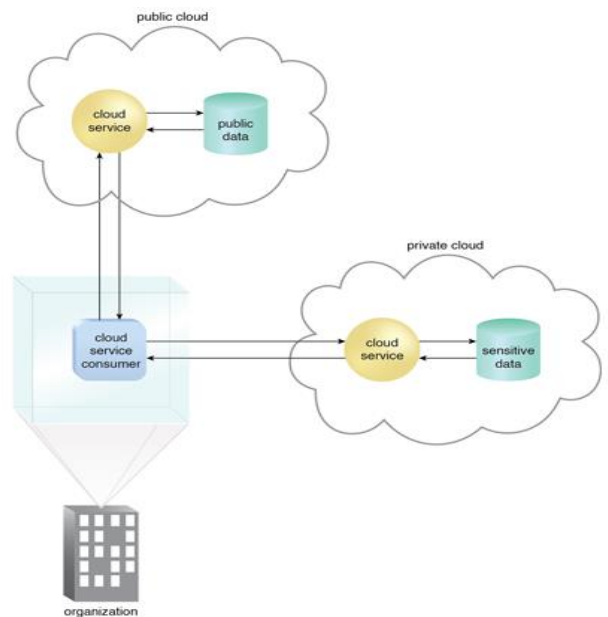


Fig-3: Hybrid Cloud Distributors

There are a number of business drivers that motivated organisations to create and use Clouds. Some of them are as follows:

(a)Capacity Planning: Capacity of an IT resource can be defined as the ability of the resource to provide efficient service according to the demand. Some discrepancies may arise between a resource and its demand, thus leading to inefficiency of the organisation. Thus, Cloud is an efficient way to avoid such discrepancies.

(b) Cost Reduction: In every organisation, the expansion of the IT environment leads to the increased investments, thus increasing the total expenditure of the organisation funds. This investment is mainly towards acquiring new infrastructure and the cost of its ongoing ownership. Thus, using Cloud Networks can subsequently cut down on such costs.

3.4 Disadvantages Of Existing System

- Downtime

It is one of the biggest disadvantage of cloud computing. As a cloud service provider handles many clients on everyday bases and they can prefer to serve any cloud user at the moment of time which could temporarily suspend once business process and may even come up against technical disconnection. Moreover if a person is not having good internet connection than he/she cannot access any of their applications, sever and data stored on that cloud.

- Security and privies

There are many security challenges and risks that a organization has to go through to use this technology. Most of the public clouds dosen't provides security at each level of operation. In a multi-renter cloud architecture there is always a risk on data stored as these clouds are accessed by multiple users ,a hacker might try to break into and access the data of any user who are using this cloud.

- Limited control and flexibility

The user can have only minimal control when using services of cloud providers as the cloud providers keeps the most of the control with themselves. They monitor and manage user's data by themselves and gives minimum control to user due to which the risk of security increases and the flexibility of storing ,updating and managing data decreases. The user can't access to the server shell or the firmware management.

- Merchant lock-In

There are many services (flexibility and security) That are promised by the cloud service provider but services like switching cloud-services is something that is not being served properly till now. This service is something which hasn't yet completely advanced till now. Due to difference between vendor the additional cost is added to migrate from one cloud to another which makes this service more costly and expensive.

4. PROPOSED SYSTEM

Clouds are usually very vast and quite expensive as well. Large organisations may find it a feasible medium to share metered IT resources but in case of smaller bodies and organisations, Clouds may be an entity too large and expensive. These smaller organisations may not need such a vast network. Hence to overcome this problem, we introduce the use of Nebula. It is basically a cheaper alternative to Clouds, feasible for smaller organisations, yet it has all the features that a Cloud has. Nebulas have the following characteristics:

- Nebulas are more dispersed as compared to Clouds.
- Main advantage of Nebulas over Clouds is that Nebulas require comparatively, very less management.
- Nebulas are constructed using Voluntary Resources which makes them even more cheap and feasible for smaller organisations.

As we have seen that Nebulas are constructed using Voluntary Resources. These Voluntary Resources are attractive because of the following characteristics:

- Scalability.
- Dispersion.
- Low Deployment Cost.

Nebula, thus, provides simple idle resources.

4.1 Advantages of Proposed System

- It is basically an open source cloud computing platform that is developed to store large data blocks.
- It also provides a flexible and easy way of storing and transferring blocks of data from one user to another using internet as a platform.
- It is also less expensive than the existing systems which make small companies or firms using its services and expanding their organization.
- It makes cross component interactions easier and more flexible.
- It provides locality, context awareness and maintains dynamic states.

5. CONCLUSION

In the above paper we present the notion of NEBULA which is made by using various voluntary resources. As it act as an alternative way for present cloud services as it is more elastic in behavior when it comes to needs of users. Some users do not need high performance, some do not need large storage and for some data movement cost is way too high. Answer to all these problems have been given by Nebula as it provides various resources through which the users can choose their platforms in accordance with the need. We believe that nebula can act as an parallel or alternative of the

clouds and can even serve as an transition pathway for the services which can be hosted on clouds.

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