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Cloud Federation Management and Beyond: Requirements, Relevant Standards, and Gaps

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Abstract: The big data requests make the cloud computing assets insufficient as well as incapable of catering the needs raised by big data requests. Business structures and the look enhancing factors have to reshape and rebuild their dynamic asset scaling abilities to modify it according to the needs. In order to tend to this administrative issue combined mists act and provide a stage. A cloud organization arrangement is proposed, planned as well as presented which caters to the need of the collaboration of the cloud suppliers in offering cloud IaaS administrations. Due to the fact that the proposed league development diversion is developed and presented, a cloud alliance arrangement system that empowers the cloud suppliers to progressively frame a cloud organization amplifying their benefit is proposed and presented. Moreover, a steady cloud alliance structure is consistently delivered, which is, the partaking cloud suppliers in the league which doesn't have motivating forces to split far from the organization. The performance and occurrence of broad examinations lead to the breaking down of various attributes pertaining to the project. The steadiness of the cloud organization acquired by our proposed system is clearly depicted by the consequences, returning high benefit for the partaking cloud suppliers.

Keywords: Cloud Federation, Economical Feasibility.

I. INTRODUCTION

Clouds are large-scale distributed computing systems built around core concepts such as computing as utility, virtualization of resources, on demand access to computing resources, and outsourcing computing services [. These concepts have positioned the clouds as an attractive platform for businesses enabling them to outsource some of their IT operations. In fact, the clouds services market share in the IT business has rapidly increased, and it is estimated to reach $150 billion by 2015. Cloud services are offered as three main categories: software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS). In this paper, we focus on IaaS, where cloud providers offer different types of resources in the form of virtual machine (VM) instances. Cloud computing systems' ability to provide on demand access to always-on computing utilities has attracted many enterprises due to their cost-benefit ratios, leading to rapid growth of the cloud computing market. Such market, however, presents a host of new challenges due to the dynamic nature of users' demands. The variability of users' demands increases when it comes to their requests for data-intensive applications. The amount of computing resources that data intensive applications require can dramatically increase, and cloud providers' available resources may not be sufficient enough to cope with such demands. This emerging service management problem in cloud computing necessitates that cloud providers reshape their business structures and seek to improve their dynamic resource scaling capabilities. Federated clouds offer a practical platform for addressing this service management problem. A cloud provider can dynamically scale-up its resource capabilities by forming a cloud federation with other cloud providers. On the other hand, other cloud providers that have unused capacities can make profit by participating in a federation. Users' requests can be satisfied by federating resources belonging to several cloud providers. A cloud federation is a collection of cloud providers that cooperate in order to provide the resources requested by users. Forming cloud federations helps achieve greater scalability and performance. If a cloud provider does not have enough

resources to provide all the requested resources to the customer, it will reject the requests which leads not only to profit loses, but also to reputation losses. However, by forming a federation with other cloud providers, it can provide part of the requested resources to make some profit. In addition, the federation may provide the resources at a lower cost. Employing only one cloud provider may lead to issues such as lock-in and a single point of failure. Interoperability among clouds can eliminate.

II. SYSTEM STUDY

FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.
Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

1) ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

2) TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources.

This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

3) SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

1. Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

3. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1) Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

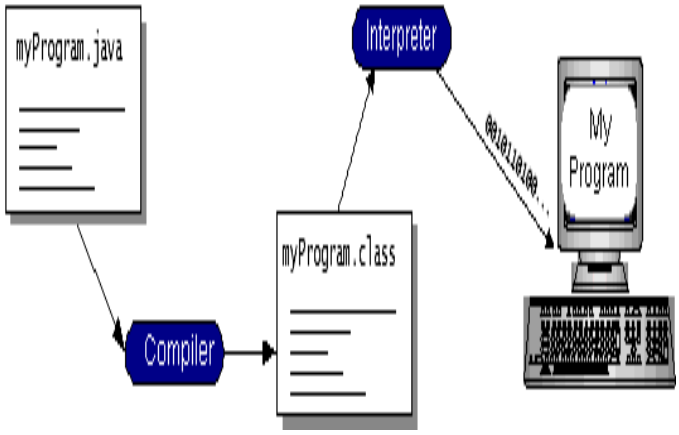
2.) Select methods for presenting information.

3.) Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

System Analysis



Existing System

We believe that sharing data among users is perhaps one of the most engaging features that motivates cloud storage. Regarding availability of files, there are a series of cryptographic schemes which go as far as allowing a third-party auditor to check the availability of files on behalf of the data owner without leaking anything about the data, or without compromising the data owner's anonymity. The problem will arise when a file is shared to multiple users.

Disadvantages of Existing System

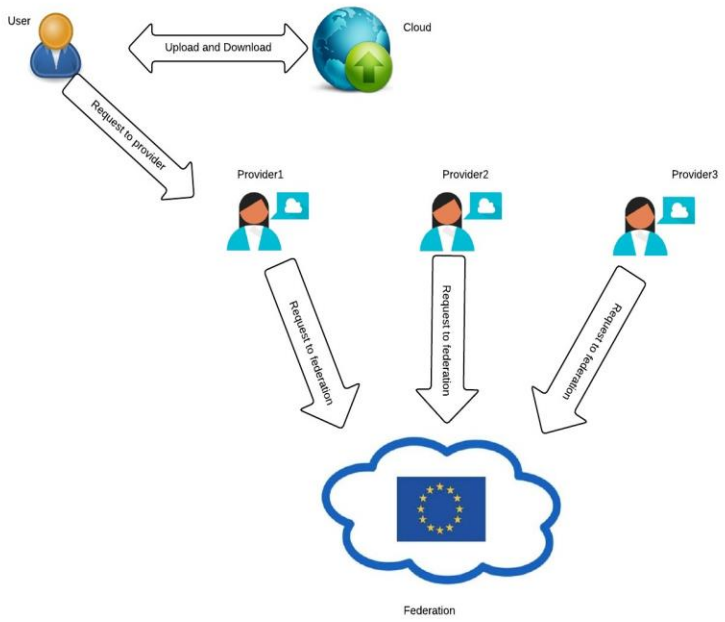
- Privacy issues
- Large Amount of space need in Cloud

Proposed System: We propose a key-policy attribute-based encryption with time-specified attributes (KP-TSABE), a novel secure data self-destructing scheme in cloud computing. In the KP-TSABE scheme, every cipher text is labeled with a time interval while private key is associated with a time instant. The cipher text can only be decrypted if both the time instant is in the allowed time interval and the attributes associated with the cipher text satisfy the key's access structure.

Advantages of Proposed System:

- Security issue will not be there.
- Privacy issues are minimized.
- Reducing the space required to store data in cloud.

System Architecture



CONCLUSION

In this paper, we proposed a mechanism that improves the cloud providers' dynamic resource scaling capabilities to fulfill users' demands. We proposed a cloud federation formation game that characterizes the process of federation formation and then proposed a novel cloud federation formation mechanism called CFFM. In the proposed mechanism, cloud providers dynamically cooperate to form a federation in order to provide the requested resources to a user. The resources are provisioned as VM instances of different types. The proposed mechanism forms cloud federations yielding the highest total profit. The mechanism also determines the individual profit of each participating cloud providers in the federation using the normalized estimated Banzhaf value. In addition, our proposed mechanism produces a stable cloud federation structure, that is, the participating cloud providers in the federation do not have incentives to break away from the federation. We performed extensive experiments to investigate the properties of our proposed mechanism. The results showed that our proposed mechanism is able to form stable federations with total profit very close to the optimal profit. In addition, our mechanism finds the stable cloud federation in a reasonable amount of time making it suitable for real cloud settings. For the future work, we plan to incorporate the data privacy concerns into the federation formation problem and to investigate the influence of cloud providers' policies on the federation formation process.

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