Accounting Federated Clouds based on the JiTCloud Platform

http://cin.ufpe.br/~faps/monext

How to charge IaaS whatever the cloud platform and in a flexible way?

Introduction

Cloud accounting refers to how cloud providers charge clients a fee for the usage of a certain service. It can be based on hardware, storage, or network and is provided as a utility service (similar to electricity). One recent research area that has been shown promising regarding cloud accounting is Federated Clouds. It allows a provider to dynamically outsource resources for other providers in response to demand variations.

Motivation

We identified four federated cloud platforms which do not address accounting, that means they do not have a proper accounting system to charge its provisioned resources. This work presents an accounting mechanism implemented originally for one of these four federated cloud platforms, called JiTCloud.



Fig. 1. There are a number of different cloud platforms or architectures that make the accounting and charging of the usage a difficult work. Thus, our solution encompasses such characteristic collecting usage information from inside the VM through an agent and sends it to a remote processing service.

Fig. **2** We implemented a DSL for charging policy specification to attend the RaaS economic model. The figure presents an example (a) and its explanation (b). The "dec" block specifies a list of ids. They are chosen among default variable previously calculated by the system. The "calc" block performs auxiliar calculations using the variables defined in the "dec" block. The "total block receives the variables used to compound the final charging rule.

COST (\$)

cpu_rate

cpu_rate

total_to_pay



Fig. We generated sixteen bills in half-hour 4 intervals for one VM over eight hours using the charging policy depicted in Figure 2.a. It can be seen the correlation between different variables (CPU and time) related to the final bill value.





Fig. 3. As a case study we used the JiTCloud platform. It is the result of a Brazilian research group and enables multiple laaS providers allocate resources only when demanded and until there is use for them creating federated clouds. The accounting mechanism was one of the four components that control the main functionalities of the platform.

Fig. **5** For one bill it shows the correlation between the used time and the number of collected usage records considering 30 VMs over eight hours.

Conclusion

• With our approach it is possible to charge from complex federated cloud platforms to individual datacenters.

• The proposed DSL enables cloud providers to specify charging policies offering a simple syntax.

• This is a new cloud contribution, since a mapping study evidenced that there is not a DSL with such purpose following the RaaS economic model.





 \bigcirc