Economical Private CLOUD Construction Through Provision of a Per-Instance Basis

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1. Introduce

Opennebula, Openstack, such as open sources and IBM, HP and other commercial cloud solutions are cloud deployment model that project basis WEB server, WAS server, and each needed to create a virtual machine[1] and measuring the respective. If You want to change the multiple projects included system to a private CLOUD, in this way, the number of the virtual machines(VM) to be explosion. As a result, the software license costs also result in explosion. In order to solve this problem, proposed a model for the provisioning of a per-instance basis and verify that this approach was how saving.

2. Provision of a per-instance basis

A project is composed of WEB, WAS and DBMS. And a information system includes a number of projects. Let's assume the organization that want to switch the information system to a private CLOUD. And Suppose that WEB, WAS and WAS Monitoring Software is a commercial solution, DBMS is shared by all projects and the number of project is 200.

2.1. WEB server provisioning per-instance

If you provision a WEB Instance on the already created Web VM, In other words, when performed through the Script a series of actions like as add IP Alias or virtual NIC, add to your account, add WEB Instance, create and mount disk quota, etc. Then, number of WEB Virtual Machine to be reduced.

At this time, each individual project, CPU, Memory, Storage, NIC and other resources allocated to the independent. And for instance, traffic metering unit and restart the daemon, etc. You can also ensure independence between projects. If you use a shared storage NAS (Netapp devices used in this document), quota for individual projects independent units can be assigned and managed. "Assigned" means the automatic provisioning using API, and "managed" means automated collection of the quota and usage data through API.

2.2. WAS server provisioning per-instance

Commercial WAS engine and WAS Monitoring solution is usually have a licensing policies per VM, and also pricing based on the number of core per VM. Thus, if you provision a WAS Instance in a way that create a WAS Instance by individual project basis on the already-created VM, In other words, WAS Instance Class file Copy, NIC Port adding Script done through a series of tasks, then You can be reduce a large number of WAS VM. In this case also should be separated the ethernet interface and allocated the storage independently, in order to be ensure the independence of the metering and billing.

2.3. DBMS server provisioning per-instance

Assume that the DBMS shared across multiple projects, and because there is no licensing cost saving factor, so a description thereof will be omitted.

3. Verification of cost-saving

3.1. Prerequisite for the verification

CLOUD System deployment costs saving by reducing the number of the virtual server license cost is the key point of introduction. The cost of verification assumed the following situation.

- 8core*2CPU, 128GB Main Memory physical server used
- 16 WEB VM per physical server, 16 WAS VM per physical server,
- 8 projects per WEB VM, 8 containers and monitoring tools accommodate per WAS VM
- server redundancy to multiple VM by 2 to ensure Service continuity

3.2. Comparison of the cost of building

According to the above assumptions, 8 Instances accommodate per VM, so it needs to 200projects/8Instances* 2multiple=50VM. Thus, the savings are as shown in the following table.

[Table 1] Reduction ratio

	General Model		This Model		Reduction ratio(%) (100-(this/general)model_license_fee*100)
	#VM	License fee	#VM	License fee	
WEB License fee ($La)	400	400* $La	50	50* $La	87.5%
WAS License fee ($Lb)	400	400* $Lb	50	50* $Lb	87.5%
WAS Monitering License fee($Lc)	400	400* $Lc	50	50* $Lc	87.5%

4. Conclusion

CLOUD system because it is based on the virtualization can significantly reduce the number of physical server, but the cost of software purchase do not saved because software licensing policies are inherited to VM. As a result, the project specific provisioning instance, while maintaining independence and reducing the number of VM with can significantly reduce the cost of software purchases, respectively.

5. References

[1] Donhyuck Lee, Sangyoon Oh, “Fine Grained Resource Scaling Approach for Virtualized Environment”, Journal of The Korea Society of Computer and Information Vol. 18, No. ,July 2013, pp.1-11