

An Effective Resource Managements Method Using Cluster-Computing for Cloud Services

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Abstract. The interest of Cloud service is rising recently. According to Gartner group's investigation, development view of Cloud service is very hopeful hereafter. However, skeptical sight is presented about Cloud service actually. If all-in-one about existent IT Resources and effective supervision are not gone ahead, because cannot secure the hopeful future about Cloud service. So, I wish to propose effective resource management method applying existent Cluster-computing for Cloud services. I show that EMRCC's simulation result. It can be manage existent IT resources effectively about Cloud service using Hadoop.

Keywords: Cluster computing, Cloud service, Hadoop, Resource managements.

1 Introduction

The cloud computing is main topic of IT industry between the recently 2 ~ 3 year. it is receiving many interests so much that is selected series 2 years in world teens IT strategy achievement according to Gartner Group's examines. The cloud computing is proposed by Google's a researcher in 2006. It is known as that is begun in effort that wish to integrate concept of existent grid computing, cluster computing, virtualization computing, integration computing etc. from service provider's viewpoint.

In this way, it must be core business by 3 government bodies that is knowledge economics department, broadcast communication. Because the interest about latest cloud computing is rising. So, they make "Total government cloud activation all-out plan" in domestic. And establishing jointly and try to arrive to world market share 10 until 2014.

However, people who have skeptical sight against exist cloud computing exist silver lining. They are deciding that they are not more in effort that cloud computing wishes to integrate existent various kinds computing technologies from service provider's viewpoint. And are possible though smooth integration for necessarily existent IT resources and authoritativeness about cloud service.

So, we wish to examine about two problems that should be solved necessarily to provide cloud service in treatise that see hereupon, and propose effective cloud service resource management method to take advantage of cluster computing technology that

can solve this. And we experimentalize to that through some simulation scenarios using Hadoop simulator. It can act in Apache web server to show feasibility.

Composition of this treatise is as following. We explained curtly about Cloud computing, cluster computing, Hadoop in related research in chapter 2. And explained about ERMCC's characteristic and action surrounding and experiment scenario that wish to propose in treatise that see in 3 chapter. And in 4 chapter, we examine about propriety for experiment scenario for ERMCC. Finally, chapter 5 described conclusion and future works.

2 Related Researches

In this chapter, we describe about cloud computing and cluster computing, and Hadoop to use to experiment ERMCC that propose in treatise curtly.

2.1 Cloud Computing

Cloud computing that proposed by Google's a researcher. It integrates IT resources that exist in existing in geographical, systematic dimension, and it is basis purpose that wish to offer and offer work that user wants conveniently to service concept to user. To make this, integrate existing IT resources in geographical, systematic dimension beforehand. Cloud computing concept displayed in figure 1.



Fig. 1. Concept of Cloud computing

So that we can integrate application programs as well as thing that bind integrating systems that is away geographically as is appearing in figure 1 simply by one and improve of resources usability and integration ability. Therefore, concept of cluster computing is required necessarily to explain next section.

2.2 Cluster Computing

Cluster computing is research for integrate computer hardware resources that exist. And it can offer super computing system that can offer more excellent performance. In Example, Eucalyptus cluster computing research explains that how can constructs existing IT resources.

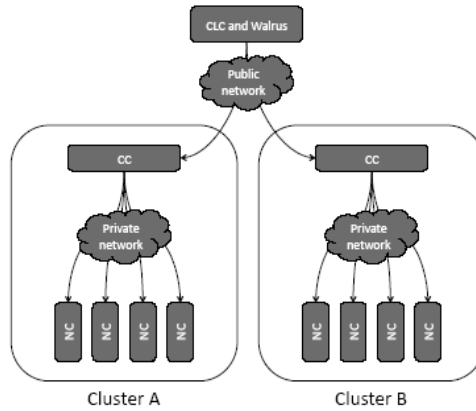


Fig. 2. Concept of Cluster computing on Eucalyptus

It connects existent computing systems by network protocol such as TCP/IP. Figure 2 is displaying concept of cluster computing on Eucalyptus.

In 2009 to example about cluster computing North Carolina college's Frank. Muller professor showed example that bind device 8 that is PS3 that it is known as game mourning and offer first scientific cluster. Thus identical computer device or similar devices bind that wish to offer high computing power.

2.3 Hadoop

It is research about simulator that can provide cloud service that is based on web service by one during Apache project. This did to introduce cluster computing concept and provide cloud service after connect electronic computing systems that have equal or resembling performance that exist in existing using TCP/IP communication protocol.

Cluster composition way that Hadoop supports is 3 types as following. This is single composition way, imagination breakup way, perfection breakup way. Single composition way means cluster that is consisted of computer resources that have equal specification. After imagination breakup way executes Java imagination machine by second, it is method to bind various hardware resources by cluster. Finally, perfection breakup way is method to bind various kind computer resources by cluster. Hadoop Distributed File System is representative perfection breakup way cluster method. This is displaying in figure 3.

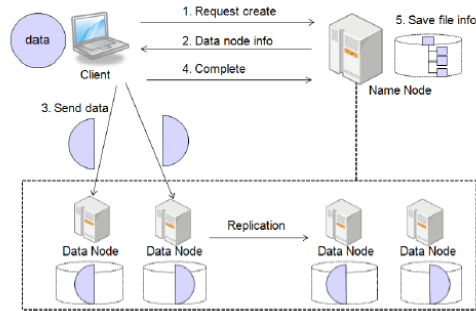


Fig. 3. Concept of Hadoop Distributed File System

3 ERMCC

We need to necessarily existing IT resources and form cluster to provide cloud service. So we propose about ERMCC (Effective Resource Management method for Cloud services using Cluster computing) that apply clustering techniques to provide cloud service that can manage existent IT resources effectively.

3.1 Compose of ERMCC

Compose of ERMCC in this paper, it wishes to use cluster computing technology. We are going to use Hadoop that is proposed in Apache project. And this treatise selected doing to provide cloud service effectively using perfection distribution way. Because of most cloud service need perfection distribution way actually.

ERMCC's composition that propose shows figure 4.

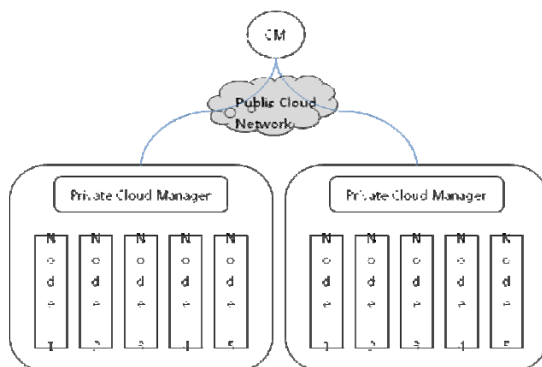


Fig. 4. Composition of ERMCC

3.2 Performance Assessments Scenarios

We wish to measure data processing time through simulation to confirm ERMCC's efficiency. Firstly, we measured data processing time in CM (Cluster Manager) and Node's computer hardware Spec is identical environment. We measure times that are transmits and writes to CM by each node. Packets consist of 100 slice dividing data of 64 MB. And we measure 5 times average. Result of simulation shows Table 1. Result of simulation shows Table 1.

Table 1. Result of simulation about identical environments

Device	Spec.	Process Time(sec)
Node 1	CPU : IBM compatible Dual	420
Node 2	Core 2Ghz	418
Node 3	Memory : 2GB	421
Node 4		416
Node 5		419

We know that same spec. node have equivalent process times.

Next, we measure process time for two cluster group that computer hardware Spec. is consisted of other nodes by second. In this time CM spec. is same first simulation. Result of simulation shows Table 2.

Table 2. Result of simulation about different environments

Device	Spec.	Process Time(sec)
Node 1	CPU: Dual core 2Ghz, Memory : 1GB	468
Node 2	CPU: Dual core 1.66Ghz, Memory : 1GB	482
Node 3	CPU: Dual core 2.4Ghz, Memory : 2GB	328
Node 4	CPU: Dual core 2.6Ghz, Memory : 3GB	320
Node 5	CPU: Quad core 2.4Ghz, Memory : 4GB	216

We know that device spec. is different than process time is too different. Because process time fellows device computing power. Table 2 shows that higher device process time is short. But lower computing power has device's result is slowly about double. We describe more performance assessment in next section.

4 Performance Assessment

As refer before, conducted simulation according to two scenarios. Prerequisite supposed that CM's Performance makes use of all identical systems in two simulations. First measure cost time transmit each by node and store data of 64 MB size by CM in first simulation scenario. Because hardware specification is same by device, difference did not appear greatly at process time. If provide cloud service composing devices that have equal hardware specification through this by cluster, the efficiency is thought to be very high.

However, is going to have much manufacturing drug to compose cluster that have equal hardware specification actually in this way. Because burden which throw away all hardware devices that have already to compose cluster that have equal hardware specification and is expense enemy who buy hardware devices newly may breed.

Second simulation carried out because consider realistic hardware configuration and hardware specification of nodes supposes case that is all. Could know that process time according to hardware specification appears until maximum 2 double as result that examine different view result.

We must be afflicted that hardware specification must do how to compose other devices by cluster actually thus. In this paper, We suggest that hardware specification is thought to have more excellent process time if compose resembling devices small scale cluster and do this to process work by other serve cluster and cooperation through CM of super ordinate concept hierarchically more.

5 Conclusion

The interest about cloud service is decayed rawly. Because this is the best solution that cloud service can solve problem about green IT technology, ashes for physical devices - use problem solving, integration of system units etc. However, many difficulties follow actually to provide perfect cloud service. It is because realistic restrictions are many to integrate perfectly various PUs among them.

In this paper, we setup cluster group by perfection distribution way selecting Hadoop that is existing cluster computing technology and this did simulation. Process time of cluster that have equal hardware specification if examine simulation result appeared by thing which is more fast. It may be best that compose devices cluster of equal specification and connect these through network to provide effective service when put off deviation. However, this is impossible actually. Because exist IT resources might be consisted of different specification by all necessities. IT resources that have different hardware specification hereupon composing cluster effectively to provide better cloud service more researches to need think.

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