

A Proposal of Web Access Distribution Method Using PlanetLab

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1 Introduction

Nowadays, more and more people become to use the Internet. When a web server is under a heavy load in a rush time, it is likely that the server decreases its performance, or can be crashed. One way to improve it is to distribute server's loads to others which are not busy. In this research, we propose a method to make a network technology using PlanetLab to distribute web access to others when the server is busy. By doing this, the web server can attain other assistant servers to distribute loads to others automatically. However for users, this system is invisible and users just do the same things as they visit website before. We verify this technology can reduce server's loads and attain a better balance of web access.

2 Proposal System

2.1 Distribution Method

We chose PlanetLab[1] to be the distribution method of proposed system. PlanetLab is a global research network that supports the development of new network services. Since the beginning of 2003, more than 1,000 researchers at top academic institutions and industrial research labs have used PlanetLab to develop new technologies for distributed storage, network mapping, peer-to-peer systems, distributed hash tables, and query processing which is likely impossible to do only in one laboratory. So we think that using PlanetLab will be easy to building this proposal system.

2.2 Two Important Servers

The purpose of proposed system is to reduce loads of web servers and distribute loads to other assistant servers automatically to keep a balance of web access. And it also makes users directly access assistant servers instead of original web servers invisibly when the original servers are busy. So there will be a management server and some assistant servers of this system. In this section, we will describe these two servers.

1. Management Server and DNS (Domain Name System)

The management server has three main functions. First, it receives requests and processes

data from a user and a web server. Second, according to the data, it judges when it should give a new assistant server to the web server to distribute loads. Last, it sends a IP address of one new assistant server to user. It can give user another server's IP address instead of the original web server according to the load of the web server and request of user. That is likely DNS server.

2. Assistant Server

The assistant server, which is one of the PlanetLab nodes, distributed around the world. To user, it is like a web server of limited functions. On the other hand, it is also like a cache system of the web server. The main function is getting information from the web server and sharing it to user to make loads of web server down.

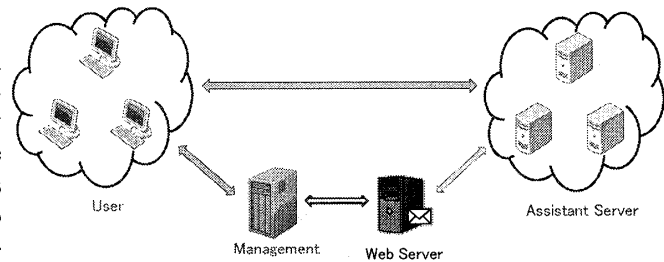


Fig.1 System Architecture

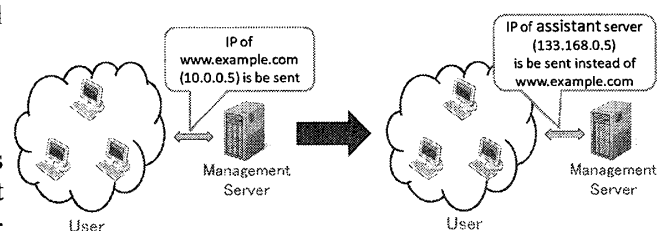


Fig.2 Change the IP address to the assistant server instead of the original web server

2.3 System Action

Figure 3 and Figure 4, the temporal analysis about system action in two cases.

The action when the web server is not in a high load (Fig.3).

1. We set the web server to send a file about state that is the load to the management server every 30 seconds.

2. User asks for the IP address of www.example.com when he wants to visit it.
3. The management server receives the request from User. According to it, the management server checks of the state about the web server. If it is not in a high load, it sends the IP address of www.exmple.com to user.
4. User gets the IP address of www.example.com and visits it.

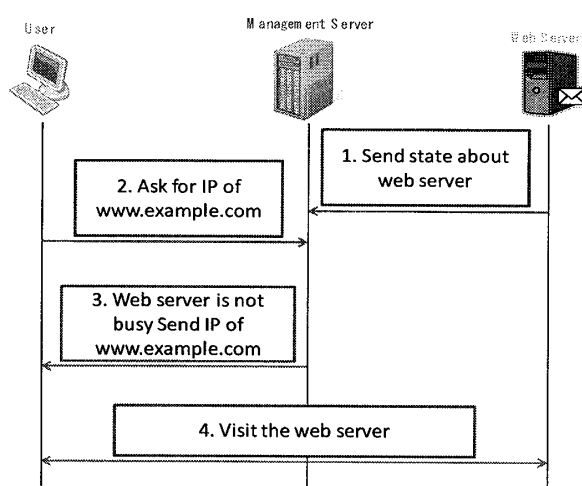


Fig.3 The action when the web server is not in a high load

The action when the web server is in a high load (Fig.4).

Step 1 and step 2 is the same the action as that when the web server is not in a high load.

3. According to user's request, the management server checks of the state of the web server. The web server is in a high load at this time, therefore the management server selects one of the IP addresses of the assistant server and sends it to user instead of the original web server.
4. User gets the IP address of the assistant server and visits www.example.com by it. However user does not know he is now visiting the assistant server instead of the original web server.
5. According to the request that user wants to visit www.example.com, the assistant server will search its own database to find the cache about www.example.com. If there are not any caches about it, the assistant server connects to the original web server and gets data from it.
6. The assistant server responds to user and sends data to user. At the same time, it will make a copy of data into its database.

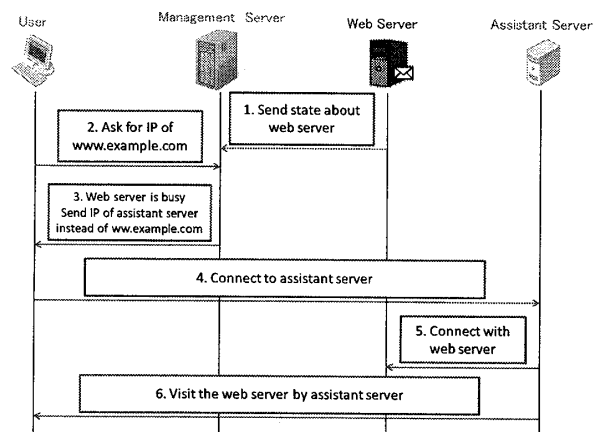


Fig.4 The action when the web server is in a high load

3 Present Situation

At the moment, the basic programming of the management server has been completed and can run some basic function. We choose C language to implement this system in Linux, because all of the notes on the PlanetLab are running in Linux. A DNS server is been running on the management server in advance. We set the web server to send its state of loads to the management server every 30 seconds. Then, the management server can know the state about the web server and judge whether it is busy or not. If it is busy, the management server will open the list of assistant servers and selects one of assistant servers IP address, add it into domain name file of DNS. It can make user connect to assistant servers instead of original server automatically.

4 Conclusion and Future Work

In this paper, we have proposed a method that is possible to distribute the load of the web server, when it is in a high load. However for users, this system is completely invisible. But we also have some problems about it such as it is better to choose the nearest assistant server to the web server for a good network connected performance instead of selecting randomly. And, we want to connect to assistant servers completely without the original web server when the original one is busy. At the moment, we have not do some evaluations about this system, because of our erroneous assumption that it is more difficultly to let the assistant server get the data according to user's request from original server. So, we will continue to improving this system to fix these problem and then we plan to do some evaluations about the performance about it to verify the effect about it.

References

- [1] PlanetLab, <http://www.planet-lab.org/> (Accessed 2010/01/05)