Design and Optimization of Nginx Sever Based on LNMP

Siping Hu, Feng Wen and Shejie Lu

ABSTRACT

With the advancement of "Internet +" and the arrival of the 5G era, the maintenance and improvement of servers is even more important. This paper starts with the construction and maintenance of the server architecture and makes the basic web service architecture. For the use of services, Nginx obviously has great advantages. The techniques that can be used in this paper are mainly on load balancing and reverse proxy. When load balancing is used, the role is to replace the server that has crashed, so that the idle one can play the original role. The main purpose of the reverse proxy in the Nginx configuration file is to call the configured payload, which is used simultaneously. They are indispensable for the entire web architecture, especially in the inward and outward docking. The external protection service is stable and the data security is guaranteed.

1. INTRODUCTION

In today’s world, both large and small countries and small areas are developing in the direction of information. Informatization has become a very important factor in the development of China’s socialist society and has played an irreplaceable role in economic development. As the largest country in the
The performance of a server can measure the efficiency of a company. As a company, it is almost indispensable to reflect the good or bad of a company. The optimization of the performance of the server can not only solve the urgent needs of some companies, but also lay a solid foundation for the company's business development. Therefore, I personally think that the optimization of the performance of the server should be one of the focuses of the company. As far as China is concerned, the construction of services is not in the past. Only a few people can get rid of the status. Some search engines and some e-commerce platforms are gradually affecting our work, study and life. Some large-scale network companies like Taobao, Jingdong, Tencent, Baidu, etc., their server performance is definitely at the top of the list, because the server is their root. Once they are off the server level, their entire company will lose everything, nothing. With the rapid development of the society, the increase of network traffic, the geometric multiple of network speed, the arrival of the 5G era, and the stability of network services have become the urgent problems to be solved. Therefore, how to build a service cluster with high stability, large practical space and strong scalability is very necessary to start from the initial service structure without affecting the original service. Develop a service optimization solution based on the current server structure and performance.

2. DEMAND ANALYSIS AND SERVICE DEPLOYMENT

2.1 Demand Analysis

The server clusters in the equipment room are mostly composed of many servers with different functions. The services cooperate with each other to form a reliable and secure system to complete the entire business. When designing, it should be based on the actual situation of the company and the computer room, using advanced equipment and relatively stable technology. In addition, it is important to ensure that service optimization will still have room available in the next few years. The current demand is roughly as follows:
(1) Each service cannot interfere with each other to prevent the occurrence of faults.
(2) Adopt advanced and cheap products and technologies that are currently used on the market to prevent excessive cost overhead.
(3) The design should ensure that users can access the external network under certain circumstances.
(4) When building, it can meet the demand for business.
(5) After the completion of the construction to be able to manage easily, not too cumbersome.

The current development technology is relatively advanced, and the functions that can be developed are also dazzling. But in general, it still needs a server. The service optimization is reflected in the fact that when some functions are temporarily unavailable, they can quickly respond, so that these tasks can be handed over to other servers, let them replace themselves live. Or on the basis of the operation, the user needs the same server to deal with the problem. In this state, the requirements for the service may be strictly limited. It is impossible to find one and just finish it, and this completes the load balancing in the service. After the reverse proxy and the reverse proxy, you can basically achieve the goal.

In the function of replacing the server when the service is unavailable, it is required that two or more servers have the same function in order to complete the task. To achieve this goal, the load balancing that I want to achieve can meet the requirements, and the ability to support it at the same time is very effective in failover.

Secondly, it is necessary to use the same server to respond to requests for a certain person's access, because sometimes the server is likely to be more than one, it is difficult to access as a normal user, and it is impossible to know exactly which server is in the same company. Docking. When we hash the visitor's IP address, the service itself responds with a certain response, so that the request for this address only allows the previous server to complete the task.

2.2 Nginx Service Build

2.2.1 SERVICE DEPLOYMENT FUNDAMENTALS

At present, all the services are built on the basis of servers and some related service technologies. I am about to build them. Because schools, companies, and government agencies may have to connect with branch schools, subsidiaries, and certain departments, and sometimes even with
international standards, international technology and equipment should be used when selecting technologies. As a well-known manufacturer in the global Linux industry, Red Hat has a complete system in the service technology segment. Therefore, the services I built are also implemented using Red Hat's related technologies.

We know that the performance limit of a server or server cluster depends on the maximum number of requests that can be processed at the same time. The server has a large amount of processing information, strong processing power, low memory consumption, and high security. So here we use the load balancing technology to ensure that multiple users are simultaneously accessed without waiting too long.

2.2.2 OVERALL SERVICE PLANNING

The load of service setup determines the scale of the service, and its performance needs to be fully utilized according to the overall requirements. So at the time of construction, the client requests the resources of the web server through the http protocol. When the server receives the request, it will determine whether the client wants a dynamic resource or a static resource. If it is static, then it is returned to the client directly from the local file system. If it is a dynamic resource, it is processed through a series of processing.

Here we have to do a combination of http and PHP, but also to implement some of the features that the MySQL database will use. The LNMP architecture I built is not only to achieve user access to web services, but on this basis, the entire architecture also has requirements for concurrent access. Because as an architecture, its goal is not only to provide users with access, but also to consider the processing power of the request, if the number of simultaneous requests can be supported, then at the peak of user access, it may appear The server crashes so that people who visit later will not get the web request page. At this time, load balancing is particularly important, so that the backup server can become the primary server immediately after the error of the primary server, which serves the purpose of responding to the service.

2.2.3 INTEGRATED ARCHITECTURE

The architecture of the operation and maintenance service is relatively simple, but some problems need to be paid attention to during the configuration process. For example, the LNMP architecture I have built now only needs to configure the Nginx service, MySQL database service and PHP service. However, in the entire layout, pay attention to the configuration file of Nginx is more complicated, some files should be placed in the corresponding
location, after the completion of Nginx compilation, and the MySQL database will be installed. To install the database, you need to establish the data storage location and modify the owner and group of some directories. After this part is completed, the database should be initialized and configured. After the database is completed, PHP installation and deployment is required.

3. Functions and testing

3.1 Functional Description

The LNMP architecture built this time is built using the method of separating Nginx from MySQL and PHP. This method is relatively complicated. If we want PHP and MySQL to be separated, we can achieve it. Due to limited conditions, the full text only makes simple load balancing and reverse proxy, but the functions it interprets are still very powerful. Its main features include:

(1) First, the LNMP architecture can be used on a Web server, which is still very advanced and useful in terms of the architecture currently in use on the market.

(2) When multiple users access the system, if the system traffic is too large and the service is temporarily unavailable, the load can slow down the pressure of one server and achieve the purpose of traffic distribution.

(3) On some e-commerce websites, sometimes you need the same server to serve a user. For example, if you add a shopping cart, you may lose it after replacing the server. In fact, we don't want such a thing occur. So we can hash the user's IP address to achieve the goal.

It can be used together with technologies such as load balancing in the network part to complement each other and achieve recovery in a short period of time.

3.2 Port test

The Nginx server as the main body is the most important. Whether the port here is detected directly determines whether the next step can be performed. If the port is not detected, the description fails. Only the port detection of Nginx can be obtained in the next step.
3.3 Functional test

As can be seen from Figure 2, the effect to be achieved is basically already there. The above test access address is unchanged, but it can be seen that the content response of the server response to the user has been reflected. This is the purpose of load balancing. When one or a part of the servers are exhausted, the system will respond according to its own situation, so that those servers in idle state can take over their tasks. This will ensure the robustness of the entire environment, and there will be no excessive waiting time when requesting resources.
Based on this feature, you can see it. By hashing the IP address of the accessing user, it is always possible to connect the same server between multiple servers. This is obvious. Sometimes we need to ensure that when the same person accesses the same resource, it doesn't always use different responses, because it is not only slow but also wastes resources. Secondly, users may not want the resources they just got to be re-find. If the same one responds, then what he wants to get will not change.

4. CONCLUSION

This article is based on LNMP, the main body is the design and service optimization of Nginx server, because the superiority of Nginx makes its application universal. This optimization is aimed at the embarrassment caused by too many visitors. In this scenario, according to the application of load balancing, this fault can be quickly reacted. The server will switch in a short time without long periods of unavailability. Otherwise, it is too unrealistic, and a company will not tolerate such a thing. Secondly, according to the needs of users, the same server needs to be connected during the access. For example, in the current shopping website, when a lot of things that you have chosen are ready to buy, if something suddenly leaves, you definitely don't want to choose it again when you come back. This is not a good time. So for this, load balancing and reverse proxy can be used at the same time.

ACKNOWLEDGEMENTS

This research was supported by the Scientific Research Project of Education Department of Hubei Province under Grant B2018179.
REFERENCE


