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ORIGINAL ARTICLE

DNS LOAD BALANCING USING BIND

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Abstract:

The Berkeley Internet Name Domain (BIND) implements a domain name server for a number of operating systems. The Domain Name System (DNS) is a hierarchical, distributed database. It stores information for mapping Internet host names to IP addresses and vice versa. The problem is that for years, load balancers have been strictly hardware-based and as such, cost and wear always took their physical toll. In the case of DNS-based load balancing, these problems don't exist or are removed from the end user. By default DNS support round robin mechanism for load balancing. But it is not going to consider processing power and load of the load balancing server. SO that approach can be consider as load sharing rather than load balancing. Here I am going to propose load balancing scheme which is going to be implement in BIND. I am going to integrate Load balancing algorithm with BIND which is going to consider load and processing power of all load balancing node.

KEYWORDS:

DNS , balancing , BIND , hierarchical.

INTRODUCTION

A DNS based approach is a classical approach to sharing the load between multiple servers. DNS responds to domain name look-up requests issued by clients and returns the corresponding IP address.
DNS is an Internet service that translates domain names into IP addresses. Domain names are alphabetic and easy for humans to remember e.g. www.yourcompany.com, but information on the Internet is delivered using IP addresses. Every time a URL that contains a domain name, the DNS will translate the name into an IP address. For example, www.yourcompany.com would be translated in 128.1.1.1.
The basic idea of DNS load sharing is to associate several IP addresses with a single host name. When the DNS responds to a request, it returns the whole list of addresses to the client. The addresses are then used in a round-robin or load-sharing fashion, thus providing some form of load balancing. BIND is an implementation of the Domain Name System(DNS) protocols. BIND is the most popular software on the Internet for providing DNS services. BIND is open-source.

Here I am going to propose new algorithm for load balancing that it resilience DNS Load balancing (DNSLBA), Which is going to integrate with BIND 9, which is open source.

It is going to monitor processing power of all servers communicating in load balancing, and will monitor number of users and CPU utilization. The load balancer will get the result of the CPU utilization and redirect DNS request to the appropriate server. This algorithm will also monitor the availability of server in case of physical or network failure. If failure occurs in any of the load balancing server, this algorithm will redistribute workload to live servers.

Title : DNS LOAD BALANCING USING BIND
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RELATED WORK

This section describes the existing solutions for load balancing using DNS. Load balancing plays an important role mainly in distributed systems because each node has its own system resources and processing power [2]. Minimizing the response time and improving the performance of each node need to be achieved, so that the system resources can be fully utilized. This is owing to different types of load balancing scheme and algorithm will produce different outcomes for achieving different objectives. Thus, an appropriate load balancing method or algorithm needs to be adopted in order to achieve better performance in a particular aspect.

A.Mirror Server: [1,7]

This approach consist mirrored server. Both servers will contain same information related to the name resolution. So in case of failure of one server other server can handle the load.

Issues:

Require additional hardware resources, so increase the cost.
It is not dynamic load balancing.
Choosing the one server among redundant itself is challenging.

B. Round Robin DNS Load Balancing: [3,4,5]

The incoming client request will be resolved by the DNS server and one of the numerous available server IP address will be replied to the client in a rotating order. This will result in each client request is being served by a different servers and the request will be redirected to any one of the servers in the cluster.

Issues:

Not resilient
Actually it is load sharing algorithm not load balancing
Does not consider CPU work load, and processing power in order to distribute load

C.Load-average algorithm (Server side algorithm): [6]

Can distribute requests across servers based on the server load. This design is very simple and fairly inexpensive

Issues:

It will fails in the case of different configuration, because it is going to monitor Load of server not processing power of server.

Rating algorithm: [1,2]

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I t works on number of users and average load of the server. It will redirect traffic to the lower loaded server.

Issues:

Issues:

Not resilient
Not considering processing power of servers, no failover detection

CONCLUSION

Existing solutions provide load balancing, but it is not that effective. Most of the methods actually not considering load balancers workload, processing power and failover status. So, it is necessary to provide DNS based load balancing which is going to consider all this factors. It should also consider failover status of all loads balancing status in order to provide resilient load balancing.

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