CHAPTER IV

ANALYSIS AND DESIGN

4.1. Analysis

At this final project, implementation the server cluster architecture with load balancing method and database failover system. First, the server cluster architecture always should be able work to serve the client requests without missing a little time due to server failure. To solve this problem, the design used two units server for each assignment. On the web server, there is Nginx as load balancer software. The reason for using Nginx, because Nginx is load balancer software that free. Nginx is also popular and get lots of support from the worldwide community. Compared with load balancer hardware, load balancer software need lower cost. Nginx as load balancer will divide all of web server which use apache service by turns using Round-Robin algorithm. If the first web server get problem, the web application still served by the web second server. On this case the Load Balancer does not make distribution on all of web servers, requests from clients directly handled by second web server which still turn on and the opposite. If one of the web server who get problem has been resolved, all of web server will be working by turns again are like the default setting.

All of Apache web server is running without database services, so it need service from database server which stand-alone. There are two database servers with MySQL service can handle the data requirements from web applications. Reasons for not using single database server to avoid paralysis of data services when the database server to crash or downtime. And also become the reason

to make data backup on a backup database server to avoid data being loss and data get damage permanently.

All of MySQL database server using failover system is handled by Heartbeat software to resolve this issue. Reason for using the Heartbeat for heartbeat is a software that free and easy to get. On failover systems, all of MySQL database server is not working together. The first database server will be set as the master server and the second database server as a backup server. If the first database server (master server) having problems then the second database server (backup server) will replace the role of the first server (master server). And if the first database server back to work normally, all of database server will works return to the default settings.

MySQL replication tasked to make all of database to be identical. Similarly with failover, MySQL replication make all of database server work interchangeably according the conditions. The first server (master database) will receive query commands from web applications, so the first database server as master will replicate data to a second database server which as slave. When the second database server become master database server, it should automatically be master which replicate the data to the first database server after the problem on first database server is fixed.
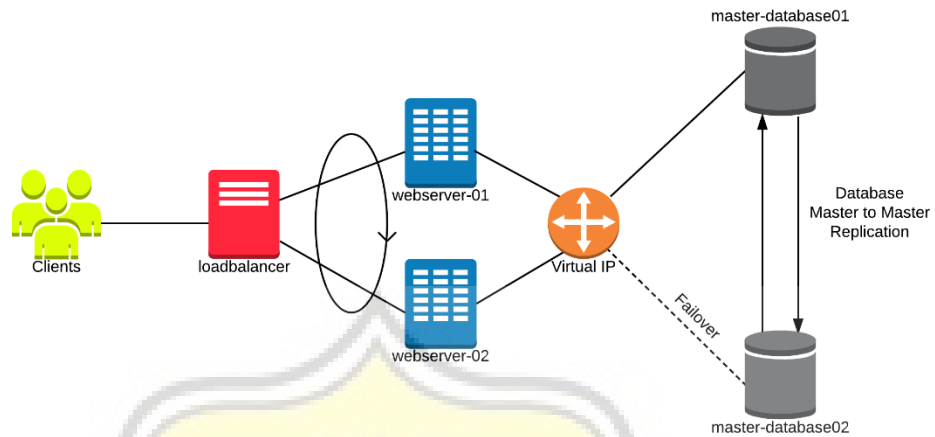
4.2. Design

Figure 1: Design for Server Cluster Architecture

On "Figure 1" seen every task executed by two servers. Requests from the client will be served by Nginx who acted as the Load Balancer software. IP address on the Nginx represents all IP addresses available on the server cluster architecture. Nginx will distribute the load request to the Apache web server who behind it. The web applications are also identical installed on all of Apache web server.

For the data purposes, the web application get it from a database server. All of Apache web server connect to database server using a single virtual IP address. The virtual IP address will be at one of the active master database server. This virtual IP address management by Heartbeat. Heartbeat installed on all database servers. All of database server active run MySQL Master to Master Replication in realtime.