NETWORK OPTIMIZATION AND MONITORING IN SMAN 4 BANDUNG USING WEBMIN

Asmunanda Imam Rasyid[1], Angga Setiyadi[2]
Teknik Informatika -Universitas Komputer Indonesia[1,2]
Jl. Dipatiukur 112-114 Bandung
E-mail : asmunanda.imams@gmail.com[1], anggasetiyadi@gmail.com[2]

ABSTRACT

One of the supporters of the network is its optimal server, by using a Proxy server recurring file. Webmin as a server management tools that run on the linux operating system. Webmin can be easily earns a server administrator to configure the server. Webmin has been around since 2000 but the new year 2010 in use because users are more and more linux servers. In addition one of the other constituents are the routerboard deviceconcentrator.
HIGH SCHOOL N 4 is one of the SMAN 4 BANDUNG *currently uses the ISO 9001:2008 quality management standard as. But as long as it does not yet have a reporting network and have yet to optimize* SMAN 4 BANDUNG. *Network high school N 4 Bandung often not divided evenly becaus e the existence of the user management in use.*

Based on the problems that have been described above, it needs a system that can optimize the network in SMAN 4 BANDUNG *and also the system which can make reporting the use of bandwidth. As for the system to be built based on the websites that hope will ease the administrators in network monitor in* SMAN 4 BANDUNG.

Keywords:
Networking, Webmin, Optimization, Mikrotik.

1. INTRODUCTION

HIGH SCHOOL N 4 Bandung is one of the schools that are located in the city of Bandung. SMA Negeri 4 Bandung currently has several classes of which 9 class to class X, Class 9 to Class XI and class XII for 10 classes. HIGH SCHOOL N 4 Bandung currently has 2 computer Lab and each lab has 30 Computers connected in a network. HIGH SCHOOL N 4 Bandung also features a single Server that is in use to create a network of Local high school N 4. And the current HIGH SCHOOL N 4 Bandung already accredited with ISO 9001:2008.

The ISO is an international independent body which has 162 National standards body to support International Standardization [1]. ISO 9001:2008 is a guideline to help organizations or companies to implement a quality management system (SMM) and menstandarkan international quality management [2]. One of the aspects of ISO 9001:2008 advocates are aspects of documentation which includes reports, documents to ensure the process goes according to existing procedures..

Yet in its journey SMA Negeri 4 Bandung has no reports of the use of the internet while in the ISO 9001:2008 report on the use of the internet is one of the supporting factors in order for accreditation of ISO 9001:2008 can continue on and keep getting better.

The condition of the internet running in SMA Negeri 4 currently have a 30 MB/s Bandwidth use two ISPS. But during this manajement Bandwidth in do use only a single router that is Routerboard RB 2011il – RM and twenty accespoint in SMA Negeri 4 Bandung. This leads to a less good bandiwh manajement.

In one day the use of bandiwth in SMA negeri 4 bandung reached over 10Mbp/s but not yet in good management with proven bandiwh available from as many as 30 MB/s only used 10 MB/s internet however feels very slow this can be caused by management bandiwh is not good.

Based on these problems in SMA negeri 4 bandung needs to have a network monitoring system that will be used to support the accreditation of ISO 9001:2008 and SMA negeri 4 Bandung need to optimize your network is already running..

1.1 Computer Network

Research methodology is a process used to solve a problem that is logical, in which require data to support the implementation of a research. The research methodology used is descriptive analysis method. Descriptive analysis method is a method of describing the facts and information in a situation or event now in a systematic, factual and accurate. This research method has two stages, namely the stage of data collection and analysis network.

As for the benefits gained in building computer networks is as follows.

a. *Sharing Resource, aimed so that the entire program, so other equipment can be used by any person that exists on a network computer without affected by locationor usage*.
b. Media communication, computer network allows the occurrence of connection between a user's computer, both for teleconferences as well as to send messages orother important information. By using computer networking two or more personswhich are very far away will be easier to work.
c. data integration, development of computer network can prevent reliance on a central

computer, each process data must not be performed on one computer only, but can be distributed to other places.

d. development and maintenance, with a computer network, then the development of the equipment can be done easily and save on costs. Computer networks can also facilitate users in taking care of hard disks and other equipment, such as providing protection against virus attacks then the user simply focusing on the hard disk on the computer center's money.
e. data security, provide protection against data. The data security assurance provided through setting the access rights of the user and password, as well as the techniques of protection against a hard disk so that the data get effective protection.

1.2 Webmin

According to wawan Herianto webmin is a web-based system administrator unix base already supports more than 40 operating system. While the webmin webmin is wiranto, according to idris web-based application that is used for system administrator tools on unix or linux.

According to Jamie Cameron Webmin is a program that simplifies the process for managing the system on Linux or UNIX. In the system oprasi Linux or UNIX is usually an administrator should use the console to mengkofigurasi server, but using webmin an administrator use to complete your webrowser.

You can conclude from these two notions wawan Herianto, idris wiranto and Jamie Cameron webmin is a system administrator in linux or unix administrators to use to set up a system that is running. The Administration can do in webmin includes user up to a webserver, DNS, Proxy, VPN even webmin can do a burn on the hardware. The current webmin has reached version 1,820 release on October 3, 2016.

Webmin is largely built using perl, and running your own using web server. The Standard port in use is port 10000. Because it uses perl then it will make it easier to add new functionality. Webmin now lets you perform tasks via a web interface to make it easier to automatically update all the necessary configuration files for you. This makes Your system administration job much easier. Some of the things you can do with Webmin includes:

Create, edit, and delete UNIX login account on your system, export the file and other system directories with NFS protocol, setting disk quotas to control how much space the user can take with them Ike, installation, view and delete software RPM packages and other formats, change your system's IP address, DNS settings, and routing configuration, the settings of the firewall to protect your computer or hosted on an internal LAN access Internet , Create and configure the virtual web site to a Web server Apache, manage databases, tables, and fields in the MySQL or PostgreSQL database server, share files with Windows system by configuring Samba

Webmin also allows for controlling many servers from a single fruit of webmin on the same subnet or LAN use. Naum webmin has a deficiency does not exist in the official repository of debian and Ubuntu because it is not compatible with how to handle packages both the oprasi system.

In addition, there is also a similar application webmin i.e. Cockpit but in his travels more in webmin gemari because has features that are more complete than in the Cockpit such as the network configuration that has not been included in it so that the administrator should add its own network module.

1.3 Mikrotik

Mikrotik RouterOS software is a popular and growing very rapidly. When dikobinasikan with the hardware specs are good then the RouterOS is able to go beyond the router that is currently available on the market.

RouterOS is able to work on several different types of hard perangakat. Mikrotik generate their own hardware based on a Single Board approach in call with routerboard. Routerboard comes with a different spesikasi different port numbers, such as Ethernet, Wireless Configuration, the Slot on the memory that is used as well as the hardware design.[16]

1.4 API*(Aplication Programing Interfaces)*

Application Programming Interface is a collection of functions or set of program code that serves to communicate a program with the kernel of an operating system. Mikrotik API is a collection of functions, Services/service that is used to communicate data on Mikrotik RouterOS to be connected using a specific bahasapemrograman applications to store data as well as used to access mikrotik itself. How to use the API is a way to import a package/class import and enable a service API on mikrotik.

1.5 PHP

PHP is a script that is executed on the server, where the code that make up the program need not be released to the user so that the confidentiality of the code can be protected. [14]

PHP is a server-side Language – scripting with HTML to create dynamic web pages. Since PHP is a server-side scripting-then syntax and commands of PHP will be diesksekusi on the server then the results will be sent to the browser with HTML formatting. [15]

PHP is designed specifically for web applications. PHP can be inserted between the HTML language and because the server-side language, then the language PHP will be executed,

and so the diserver is sent to the browser is "finished" in the form of HTML, and your PHP code will not be visible. PHP includes Open Source Product and currently has reached version 5. So you can change the source code and distribute it freely. PHP was released for free. PHP can run on a variety of Web servers such as IIS, Apache, PWS, etc.

Thus the program code written in PHP will not be visible to the user so that the security of the web page is more assured. PHP was designed to create a dynamic web page, that web page that can display a form based on current demand, such as displaying the content database to a web page. While according to Nugroho (2006b: 61) "PHP or stands for Personal Home Page is a scripting language embedded in HTML for the executed server side". PHP included in the open source product, so the PHP source code can be modified and distributed. The latest version of PHP can be downloaded for free via the PHP official site: http://www.php.net.

PHP can also be run on a variety of web servers such as IIS (Internet Information Server), PWS (Personal Web Server), Apache, Xitami. PHP is also capable of running on multiple operating systems currently in circulation, including: operating system Microsoft Windows (all versions), Linux, Mac Os, Solaris. PHP can be built as a module of Apache web server and as a binary which can be run as a CGI (Common Gateway Interface). PHP can send HTTP headers, can set cookies, set authentication and redirect users.

One of the hallmarks belonging to PHP is its ability to connect to a wide variety of software database management system or Database Management System (DBMS), so as to create a dynamic web page. PHP has a good connection with some DBMS such as Oracle, Sybase, mSQL, MySQL, Microsoft SQL Server, PostgreSQL, Adabas, Solid, Velocis, FilePro, dBase, Unix dbm, and no exception all air-interface ODBC database.

Almost all web-based applications can be created with PHP. But the major powers is database connectivity with the web. With this capability we will have a system database that can be accessed.

2. RESEARCH CONTENT

2.1. Analisis API Mikrotik

API (Application Programming Interface) is a service that lets users create custom software or applications that communicate with Mikrotik Router, for example, to retrieve the information in the Mikrotik Router Mikrotik Router, manage, or even perform configuration of Mikrotik Router OSTM against. Application programming Interface is implemented by applications, libraries, and operating systems to determine the calling konverensi and is used to access the service.

Application programming Interface include specifications for routines, data structures, object classes, and protocols used to communicate with. An API is an abstraction that describes an interface for interacting with the mekumpulan function that is used by the components of the system software.

Application programming Interface to communicate with Mikrotik Router using fire sentences consisting of FIRE command (command) and attributes-attributes. FIRE sentence sent using a very specific shape that is made up of a few lines or words, when sent to the routers of each word must have a prefix, and the last word in the sentence should FIRE diterminasi with 0 (must contain the bytes are arranged everything with 0).

1.2 Analysis Of Data Bandwidth

The network is the data analysis phase was conducted to analyze the data in Miss through the network. Network data in the form of traffic bandwidth usage and the use of existing user in network SMA Negeri 4 Bandung. Use of internet traffic in SMA Negeri 4 Bandung for a day has weathered 10.2 Mb/s for downloads and 3.3 Mb/s for Upload can be seen in Figure 2.1:

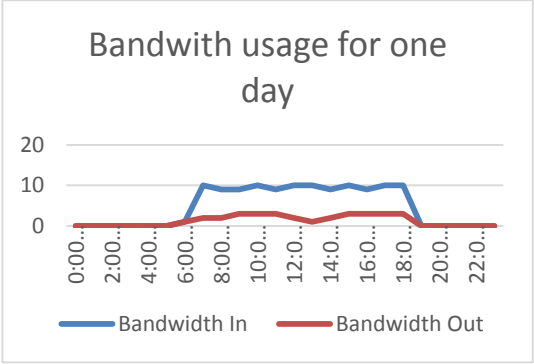


Figure 2.1: Bandwidth Usage For One Day

In addition to the use of Bandwidth for one day, the use of Bandwidth for a month in SMA Negeri 4 Bandung reached 9.3 Mb/s for Referrals and 1.3 Mb/s can be seen in Figure 2.2:

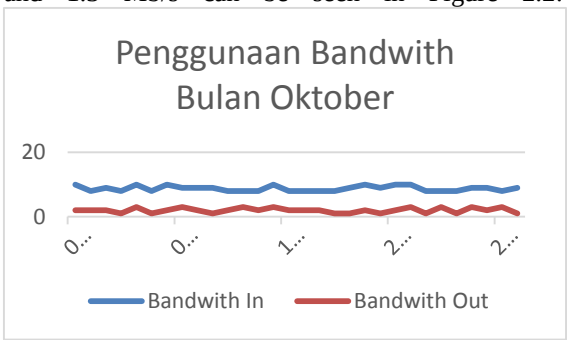


Figure 2.2: Bandwidth Usage during the month of October

Based on the data network in SMA Negeri 4 Bandung can conclude that the use of extremely high traffic each day because the available bandwidth is 10 MB/s

1.2 analysis of the Proxy Server

Design of proxy server for caching a user function to improve network performance by storing the results of the request object data such as HTTP, HTTPS, etc. Note that the capacity of the hard disk of the server domain as that is 500 GB and the average size of the

cache that is 13 KB. Proxy Server will be built using harddisk 500 GB capacity. The magnitude of the cache that will be used is 80% of the capacity of a hard disk that has a capacity of 500 GB to a proxy server. Then the results are obtained, namely 400 GB. Before the configuration against the user, do the calculation for mengentukan disk cache in squid to cache to save the assignment. The following is the formula for menhitung disk cache squid :

z = (((x / y) / 256) /256) * 2

Description:

z = number of directory which will be created in the directory/cache

x = magnitude of disk cache to be used (in units of Kb)

y = average number of object (13 Kb)

Then the results of the calculation of the magnitude of the disk cache to be used isas follows.

Z = (((16.000.000/13)/256)/256) * 2

Z = 38

With the results of 38 and the capacity of the hard drive to cache 16 GB then the script at squidnya that is as follows:

cache_dir ufs/cache 16000 38 256

From the results of the script is to be used, the directory size is 16000 in 16 Megabytes is the sub directories and 256 is a sub directory level II.

In the design of proxy creation will be done designing a workflow system that is the first time you run a user request from a browser either word search, as well as website addresses/URLs by default routed through port 80 or 443. Here is a picture which is a Groove 3.31 request/demand before the application proxy to a web/URL

.

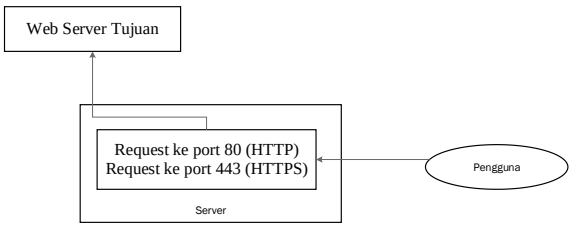


Figure 1.3 Demand Flow Without proxy

Based on Figure 3.31, note that by default when users access a webseite will connect through port 80 or 443. Iptables firewall will change or redirect requests that come to port 80 to port 3128 and port 443 to port 3129. Application of Squid akam filter every resource request/request can be forwarded toward the destination website address or not, in case of rejection will be forwarded/redirect on the page denial of access that is fixed on a Portal site addresses SMA Negeri 4 Bandung. The first filter is done based on the destination address of the site, whether the site contains elements that may not be accessible or not, if not then it will be forwarded to the Portal SMA Negeri 4 Bandung, i.e. 192.168.2.200. The second filter will be done based on the word, is a word searched for contain a word that should not be traced or not, if not then it will be forwarded to the page 192.168.2.200..

1.3 Installation Squid

Remote server using SSH putty which has been connected to the server HIGH SCHOOL N 4 Bandung, and then enter your username and password root server HIGH SCHOOL N 4. If true then it will go to the terminal server. Like below:



Picture of a 1.4 Terminal Server HIGH SCHOOL N 4 Bandung

After that input the command Sudo apt-get install webmin, then press the ENTER key, and then the server will start installing webmin on server.

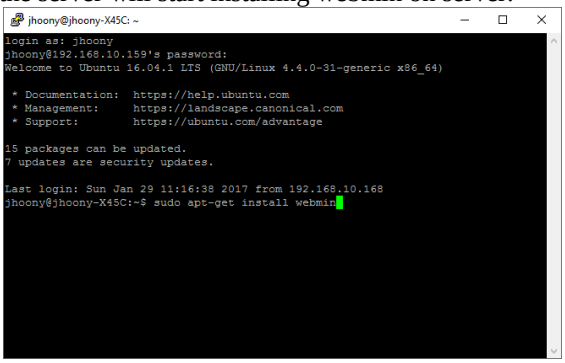


Figure 1.5 Printah Install Webmin

After you have finished installing webmin via a terminal. Now login to webmin for checking whether or not already installed, for mengakases and 192.168.10.159 server address using port 10000.

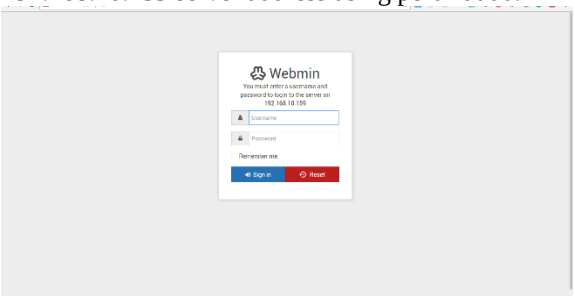


Figure 1.6 Installation Test

Enter your username and password, then click the Sign in button

1.4 Configuration proxy

The next configuration settings changes i.e default squid. Log in by entering your username and

password: root and password in accordance with user root server. Then click the Sign in button.

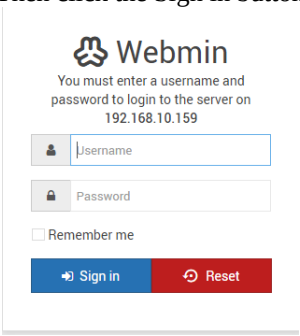


Figure 1.1 Webmin Login

The following image is of the main menu in the GUI display with webmin on web Browser

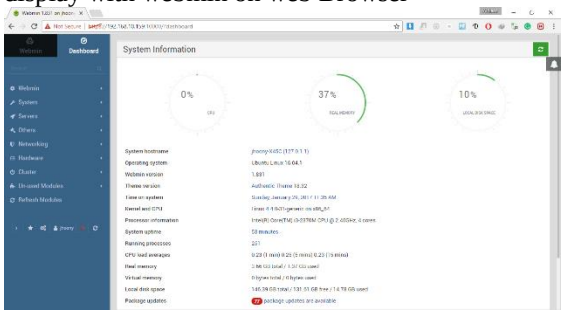


Figure 1.1 webmin main Menu

After successful entry to the main menu select menu squid proxy server on the left as shown in the following figure 4.6:

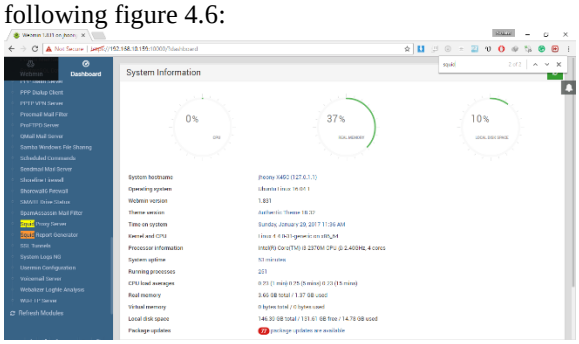


Figure 1.2 Menu of squid

After that, the display will appear from the configuration page in squid, squid configuration page that should be in this configuration is as follows.

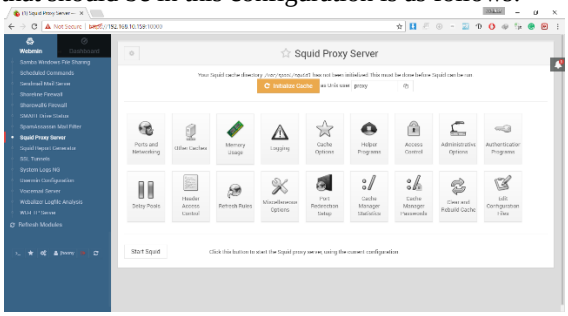


Figure 1.10 Configuration Squid

Conclusion

After doing the analysis, design, and testing. Then the conclusion can be obtained as follows:

1. the information system in the wake of bandwidth an help HIGH SCHOOL N 4 Bandung to monitor Bandwidth Usage in realtime.
2. the information system in the wake of already HIGH SCHOOL N 4 can help Bandung to see and report on the use of Bandwidth.
3. the proxy System in the wake of the internet network can optimize already in high school N 4.
4. The information system in the wake of already-based GUI

Suggestions

In order for the system to be built can work even better, should be done the addition of few things as follows:

DAFTAR PUSTAKA

[1] *"International Organization for Standardization," 2009. [Online]. Available:h*ttp://www.iso.org/iso/home/store/catalogue_tc/catalogue_detai l.htm?csnumber=39833. *[Accessed 28 September 2016]*.

[2] "*ISO 9001:2008 Quality management systems*," *[Online]. Available*: http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnu mber=39833. [*Accessed* 28 September 2016].

[3] M. syafii, *Konfigurasi Server Linux dengan Webmin*, yogyakarta: penerbit Andi, 2004.

[4] Debian, "*Debian*," Debian, september 2016. [Online]. Available: https://www.debian.org/intro/about. [Accessed 30 September 2016].

[5] Wikipedia "Wikipedia", September 2016 [Oline]. Available: https://id.wikipedia.org/wiki/Organisasi . [Accessed 30 September 2016].

[6] Wahana Komputer, *Konsep Jaringan Komputer dan Pengembangannya*. Penerbit Salemba Infotek, Jakarta 2003.

[7] Jasakom, *Mikrotik Kungfu*, Towijojo Rendra Jakarta 2016