An Analysis Comparative of Response Time Squid Proxy on Windows Server and Linux Server

Sirait, Parulian

Nommensen HKBP University

1 September 2016

An ANALYSIS COMPARATIVE OF RESPONSE TIME SQUID PROXY ON WINDOWS SERVER AND LINUX SERVER

Parulian
(157038015)
S2 Studies Program, Information Technology, University of North Sumatra

Abstract

In the development of information technology, information is obtained quickly through technology computer network known as the Internet. The use bandwidth for Internet access can be maximized by using a proxy server. One of the proxy server is squid. The use squid as the proxy server need to consider the operating system on the server and have not known its best performance on any operating system yet. For that it is necessary to analyze the performance of squid proxy server on a different operating system, in this case for Linux and Windows. The study was conducted to compare the response time squid proxy server when compared to its use on Windows server and Linux server. To achieve the objectives of the study, conducted testing by implementing squid proxy server on Windows server and Linux server. Then, from the client computer is accessing the Internet from each server using a web browser such as Mozilla Firefox and Internet Explorer. For simplicity, this study uses a client with 10 times test site access from the server. The results of test performed, we concluded that the response time by using squid proxy server on a Linux server is better than using on the Windows server. This case evidenced from the results of experiment that showing the most changes in response time is from the Linux server.

Key word: **Proxy, Linux, Windows**

Formulation Problem

The issues that is necessary for the performance squid on server operating systems are different in this case the Linux operating system and Windows formulated as follows:
a. How to use Squid as a proxy server to increase the speed of Internet access?
b. The use Squid need to consider server operating system. On the operating system whether Squid provides the best performance?

Methodology

The methodology which used to complete this study as follows:
a.   Literature Study
     Collecting and studying the theory associated with the operating system Microsoft Windows Server 2008 and Fedora Core 16, and squid proxy server and proxy server implementation on Windows server and Linux server.
b.   Analysis and Design
     Doing response time analysis to be performed on the client computer is accessing the site from a server using Squid proxy server and design of client-server computer network used for testing.
c.   Installation and Configuration
     Doing the implementation and configuration of the server computer that meets the minimum specifications for the server operating system Microsoft Windows Server 2008

and Fedora Core 16. After implementation and configuration server, do the installation and configuration of the Squid proxy server. For Internet access use USB Modem, then the installation and configuration did on the server computer USB Modem

d.   Experiment and Analysis Its Result
      After installation and configuration server, do a number of attempts to access several sites on server using Linux and Windows operating systems, by using Mozilla Firefox and Internet Explorer version 8 of the client computer.

The experimental results of each server recorded in the form of access time to display the site is accessed. The processed results are summed the best used is better when using a proxy server squid.

Problem Analysis

The problem is how the performance of squid proxy server which used to increase the speed of Internet access on two servers with different operating systems. Response time squid proxy for displaying one page of the site will be considered and accounted in this case. Accessing site response time is the time of site access required in client web browser to display sites that are accessible from the server. Response time is recorded in the form of time until the completion of the sites accessed Web Browser displayed on the client.

Draft Testing

Network that used for testing is a network with a kind of client-server system, where there is one computer acting as a server and a computer connected to it as a client. For the network topology, this study uses the star topology where the server and client will be connected by a hub (media liaison), the different is this study uses only one client.

For the implementation of the study, required testing media. Media testing there are 2 types , that is using one server and using two servers. The design of the test media using a single server. The section on design is described as follows:

a.   Modem is a device used to communicate with the Internet network.
b.   Server is computer that serve every client request that is connected in a network.
c.   Switch is a link between the server computer to the client computer.
d.   Workstation (client computer) is the computer that requested the service to the server.
e.   Cable UTP (Unshielded Twisted Pair) straight that is used to connect the client computer and the server using the connection switch.
f.   Draft IP address for client computer and server created using the static IP address version 4. IP Address used is a class C which consists of 24 bits for the network ID and the remaining 8 bits are used for the host ID. Class C IP address is used for small size network. In the first 3 bits give the number 110 so that the initial bits of the IP ranging from (192-223).

Stages of Testing

Sites accessed is determined by observing sites frequently accessed by Internet users for example, social networking sites, education, and news. The sites will be accessed and recorded response time accessing it as follows:

a.   http://www.okezone.com/
b.   http://www.kaskus.co.id/

c. http://www.exploreyourbrain.com/
d. http://www.ganool.com/
e. http://www.bhinneka.com/

Before conducting the test, is necessary to determine the steps being taken systematically. On Windows and Linux servers is done the same stage. Steps being taken is shown in the following flow chart drawing.
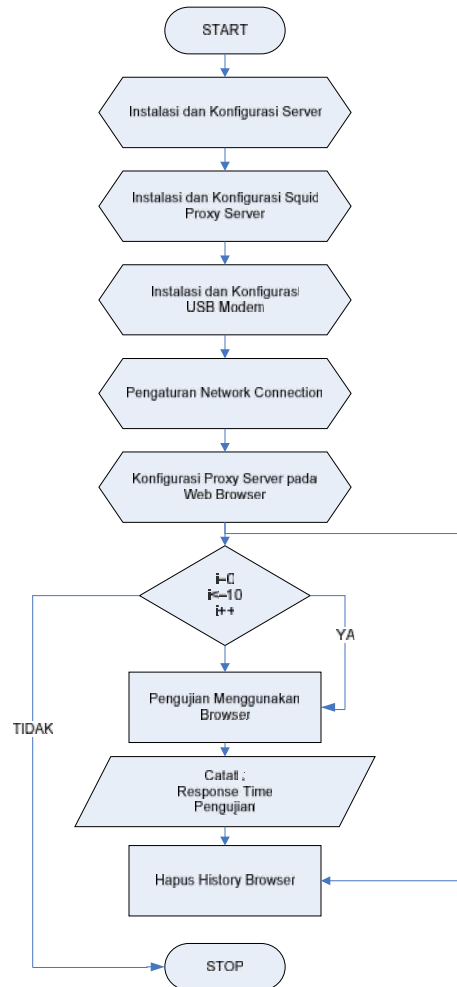

Figure 1.
Flow Chart Testing Stages

Before conducting the test, do the preparation on the server computer, as follow:
   a. Installation and Configuration Server includes setting the IP address server.
   b. Installation and configuration of the server proxy serversquid
   c. USB modem installation and configuration that will be used as an Internet connection on a computer server.

On the client computer testing is done using two web browser. Steps being taken on the client computer as follows.
   a. Server computer network connection settings

b. Configuring proxy server in the web browser will be used
c. Connect the server to the client computer as the picture Design Media Testing using switches.
d. Experiment accessing sites that have been determined.
e. Record the time required to display each of the sites accessed on the client computer. The time recorded is the time shown on the browser.
f. Clear history accessing the browser on the client computer.
g. Return to step d, e, and f. If you've done 10 times the test is finished for the fifth predetermined sites.

The output of response time on testing to be processed to obtain the conclusion of the study.

Implementation and Testing Recording Response Time In Mozilla Firefox Browser
To find out responsetime accessing site taken from the time shown on the browser Mozilla Firefox to complete displays all pages of the site, carried out in stages as follows:
a. Open the browser Mozilla Firefox
b. Access website to calculate the response time **https://tools.pingdom.com/**. Then select the stopwatch menu.
c. In the field enter the URL to be measured type the website that will count its response time.

Recording Response Time in Internet Explorer Browser
For the recording of response time in the browser Internet Explorer 8 performed similarly to the calculation of response time on Mozilla Firefox by accessing the website **https://tools.pingdom.com/**

Response Time Test Results
Tests performed on the client computer. Before conducting the test, is necessary to regulate IP Address Client computers. Its setup is done through the following steps:
a. Click the start button-Control Panel-Network Connections- Local Area Connection
b. On the General tab in the search dialog Internet Protocol (TCP / IP) and click the Properties button.
c. For setting the IP Address radio buttons dynamically, choose Obtain an IP address automatically and Obtain DNS server address automatically. For setting a static IP address Choose the radio buttons Use the following IP address and then fill in the IP Address section with the computer's address according to the application servers on the subnet mask of 255.255.255.0 and filled in at the Default Gateway fill in the IP Address of the computer acting as a server.
d. To end and save your changes, click the OK button and then click the Close button and if it pops up a confirmation for restrart computer then choose to restart the computer.

After setting the IP Address, then continued with the setting HTTP Proxy to IP addresses server to port 8080 on the client browser. For the Mozilla Firefox browser, follow these steps:
a. Open the Mozilla Firefox browser on the client computer. Select the tools menu and sub menu-Select advance-select network-Click the Settings button

b. Select Manual proxy configuration, in the HTTP Proxy, type server IP Address and server port 8080 and click OK to ended the proxy configuration in Mozilla Firefox.
c. For the browser Internet Explorer 8 follow the steps below:
1. In Internet Explorer go to Tools, Internet Options.
2. In the Internet Options window, select the Connection tab
3. Select LAN settings, check the Use a proxy server for your LAN and enter the IP Address and Port 192.168.80.1 Server 8080. Then click the OK button to complete the Proxy settings in Internet Explorer.

Tests performed 10 times with each browser on each server. The average response time is calculated by adding up the overall response time divided by the number of experiments conducted, formulated as follows:

> **average response time = (number of response time) / (number of trials)**

Percentage change in response time is calculated by subtracting the response time of the first test with response time testing the next smallest first divided by response time and multiplied by 100%, formulated as follows:

> **%perubahan =((response time ke1)-response time terkecil)/(response time ke1) X 100%**

Testing Results Using Windows Server Response Time
Results response time (in seconds) who performed site access from a client computer on a Windows server are described in the following table and testing with the smallest response time is marked in bold.

Table 1
Response Time accessing the site from a Windows Server using Mozilla Firefox

Situs	Percobaan Ke -										Rata-rata Response Time	% Perubahan Response Time
	1	2	3	4	5	6	7	8	9	10		
http://www.okezone.com	59	20	26	25	37	31	**17**	37	60	80	39.2	71.186
http://www.kaskus.co.id/	77	50	40	45	36	23	47	30	**15**	28	39.1	80.52
http://www.exploreyourbrain.com/	38	25	28	27	29	30	21	**13**	20	23	25.4	65.79
http://www.ganool.com/	120	71	50	140	58	54	**43**	102	90	95	82.3	64.17
http://www.bhinneka.com/	110	35	**13**	39	17	24	14	14	25	32	32.3	88.2

Table 2.
Response Time accessing the site from a Windows server using Internet Explorer 8

Situs	Percobaan Ke -										Rata-rata Response Time	% Perubahan Response Time
	1	2	3	4	5	6	7	8	9	10		
http://www.okezone.com	31	36	40	101	36	41	**15**	55	86	87	52.8	51.613
http://www.kaskus.co.id/	20	56	62	17	58	**12**	50	30	31	35	37.1	40
http://www.exploreyourbrain.com/	30	**12**	25	38	39	32	24	29	23	30	28.2	60
http://www.ganool.com/	57	26	52	32	87	**22**	28	25	24	26	37.9	75.44
http://www.bhinneka.com/	123	35	68	16	51	**14**	20	32	16	20	39.5	88.6

Testing Results Using Linux Server Response Time

Results response time (in seconds) access is performed on a Linux server using a web browser Mozilla Firefox is described in the following table testing with the smallest response time is marked in bold.

Table 3.
Response Time accessing the site on a Linux Server Using Mozilla Firefox

Situs	Percobaan Ke -										Rata-rata Response Time	% Perubahan Response Time
	1	2	3	4	5	6	7	8	9	10		
http://www.okezone.com	49	18	26	20	28	18	17	**12**	16	15	21.9	56.061
http://www.kaskus.com/	66	45	33	25	27	20	24	23	**15**	21	29.9	77.27
http://www.exploreyourbrain.com/	30	25	21	18	21	17	21	**13**	20	23	20.9	56.67
http://www.ganool.com/	85	65	40	50	35	**31**	40	45	55	36	48.2	63.53
http://www.bhinneka.com/	90	30	13	31	15	21	**12**	14	25	32	28.3	86.7

Table 4.
Response Time accessing the site on a Linux Server Using Internet Explorer 8

Situs	Percobaan Ke -										Rata-rata Response Time	% Perubahan Response Time
	1	2	3	4	5	6	7	8	9	10		
http://www.okezone.com	31	25	15	35	36	41	15	24	39	28	28.9	51.613
http://www.kaskus.com/	20	18	25	17	38	12	27	30	31	35	25.3	40
http://www.exploreyourbrain.com/	30	12	25	38	29	17	24	29	23	27	25.4	60
http://www.ganool.com/	57	26	45	32	40	22	28	25	24	30	32.9	75.44
http://www.bhinneka.com/	40	21	35	16	31	14	20	32	16	20	24.5	65

From the test data test data next visible change being faster than in the first test. It is a proof that the use squid as the proxy server can increase the speed in accessing the site. In this case the Squid caching proxy server that squid as to store objects that have been requested from the server on the Internet that can not subsequently access directly from the Internet but from the cache that have been previously stored in the server.
The average yield response time accessing sites that are performed on two different servers using two browsers.

Table 5.
The Average Response Time

Sites	The Average *Response Time*			
	Browser Mozilla Firefox		Browser Internet Explorer	
	Server Windows	Server Linux	Server Windows	Server Linux
http://www.okezone.com	39.2	21.9	52.8	28.9
http://www.kaskus.com/	39.1	29.9	37.1	25.3
http://www.exploreyourbrain.com/	25.4	20.9	28.2	25.4
http://www.ganool.com/	82.3	48.2	37.9	32.9
http://www.bhinneka.com/	32.3	28.3	39.5	24.5

In the table above shows that the average access smaller is to use a Linux server. For sites http://www.kaskus.co.id and http://www.bhinneka.com, the smallest response time using a web browser Internet Explorer version 8.
From the results of the test data, calculate the percentage change in the largest response time that happened in the 10 times of testing. Percentage change in response time to five different sites on the server using a web browser on the client are described in the following table.

Table 6.
Percentage Changes in Reponse Time

Sites	% Response Time Changes			
	Browser Mozilla Firefox		Browser Internet Explorer	
	Server Windows	Server Linux	Server Windows	Server Linux
http://www.okezone.com	71.186	56.061	51.613	51.613
http://www.kaskus.co.id/	80.52	77.27	40	40

http://www.exploreyourbrain.com/	65.79	56.67	60	60
http://www.ganool.com/	64.17	63.53	75.44	75.44
http://www.bhinneka.com/	88.2	86.7	88.6	65

From the data the percentage change response time, it can be seen that the change in response time from servers that have access to use squid as the proxy server is on a Linux server. From the data obtained through testing it can be concluded that the implementation of the squid as the proxy server will give their best performance on servers with Linux operating system in this case using Fedora Core 16.

Conclusion

From the analysis of the test results, it could be concluded as follows:

1. The use squid as a proxy server aims to increase the speed in accessing the site.
2. Average response time smallest site access is via a Linux server that is 21.9; 29.9; 20.9; 48.2; 28.3 seconds by using Mozilla Firefox and 28.9; 25.3; 25.4; 32.9; 24.5 seconds using Internet Explorer
3. Performance squid seen from changes in response time that most are using Linux as a server operating system.
4. Accessing the site is not always faster to use Mozilla Firefox, from 5 sites accessed, there are three sites had an average response time smallest compared using Internet Explorer 8.

Suggestion

After the assessment, some of the things suggested for further research are described as follows:

1. Response time of use squid proxy serverdicatat of the client computer only. For further research, it can be done by using more than one client to access the same site.
2. Performance use squid as a proxy server in this study only seen from changes in response time access, to further research can be conducted with respect to other aspects, such as server memory usage.

DAFTAR PUSTAKA

[1] Arna. 2007. Pengenalan Sistem Operasi.pdf. http://lecturer.eepisits.edu/~arna/Diktat_SO/1.Pengenalan%20Sistem%20Operasi.pdf.
[2] Budianto Aris. 2007. Instalasi Fedora Core.pdf. http://fkip.uns.ac.id/artikel/linux/Instalasi%20Fedora%20Core.pdf.
[3] Gabungan Kelompok Kerja 21–28 IKI-20230. 2003. SistemOperasi-1.3.pdf. ftp://komo.padinet.com/free/v06/Kuliah/SistemOperasi/BUKU/SistemOperasi-1.3.pdf, diakses 28 Desember 2011.
[4] Hasanudin Nandang. 2009. Instal Squid Di Windows.pdf. http://www.scribd.com/doc/26846936/Instal-Squid-Di-Windows, diakses 13 Januari 2012
[5] Ida Bagus Dony Prawita. 2010. Jenis-Jenis Sistem Operasi.doc. http://www.docstoc.com/docs/62675496/JENIS--JENIS-SISTEM-OPERASI, diakses 13 Januari 2012

[6] Imron A.Md. _____. 2_About Windows Server 2003.pdf. http://www.unsri.ac.id/upload/arsip/2_%20About%20Windows%20Server%202003.pdf.

[7] Kulbir Saini. 2011. *Squid Proxy Server 3.1 Beginner's Guide*. Birmingham: Packt Publishing Ltd. Majid Nur Kholis. _____. *Mini Book Jaringan Komputer Dan Aplikasinya.pdf*. http://www.scribd.com/doc/27672865/Mini-Book-Jaringan-Komputer-Dan-plikasinya.