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“DNS SEHAT” Implementation on Automatic Replicated Recursive Domain Name System on PT. X

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Abstract— Thanks to the existence of Search engines, all of informations and datas could be easily found in the internet, one of the search engine that users use the most is Google. Google still be the most popular search engine to provide any informations available on the internet. The search result that Google provide, doesn't always give the result we wanted. Google just displayed the results based on the keyword we type. So sometimes, they show us the negative contents on the internet, such as pornography, pornsites, and many more that seems to be related to the keyword, whether the title or the other that makes the result going that way. In this paper, we will implement the “DNS SEHAT” to pass along client's request queries so the Google search engine on the client's side will provide more relevant search results without any negative contents. **Keywords**—Search Engine, Google, DNS, Negative, Contents.

I. INTRODUCTION

Do you know Google still be the most popular search engine in the internet? Most of people in the world, use Google to search anything they want to know[1]. All of informations and datas in the internet could be easily found using Google. Although Google will provide any informations and datas available in the internet, the search results could be irrelevant to what we're going to search[2]. Google use the keyword that entered by users to begin their search query, so that Google give you the result based on what keyword you entered. Sometimes, the negative content will appear on the search results, this negative content could be pornography, pornsites, and many more that seems to related to the keyword user's entered. An analysis to The Implemented “DNS SEHAT” indicates that this “DNS SEHAT” will pass along client's request queries so the Google search engine on the client's side will provide more relevant search results without any negative contents.

II. BACKGROUND

Through work letter from the Ministry of Communication and Information of Indonesia Number 28/KEP/M/Kominfo/1/2009, the Ministry of Communication has announced officially INSAN (Internet Sehat dan Aman) program on February 23th 2009. This was an action to prevent any negative contents on the internet such as pornography, gambling site, fraud, and hoax sites. In realization, Indonesia Internet Service Provider Association (APJII) announce work order Number 780/APJII/KETUM/VII/2018 to convey the Indonesia's Internet Providers to activate Safe Search to their networks. Before that work orders announced, PT X has not taken any preventive action against negative contents on the Internet. So that, their clients easily exposed by the negative contents both directly or indirectly accessed[3]. Therefore, System

Administrator Division on PT. X trying to participate The activation of Google Safe Search on their networks to prevent their clients exposed to the negative contents by using Unbound on their Recursive DNS Servers.

A. Scope

This paper provides the implemented Recursive DNS Server to Relay client's DNS Request query and then filtering the google search's results by using google safe search features and passively maintain the configuration to replicated server.

B. Purpose

This paper provides the information about how to prevent negative contents on the internet by doing:

- Building Automatic Replicated Recursive DNS Server with *Unbound*.
- Installing and Configuring Automatic Replicated Recursive DNS Server with *Unbound*.
- Test the Automatic Replicated Recursive DNS Server.

C. Usability

The system that implemented on PT. X has usage to protect their clients by filtering the negative contents on Google search engine by activating Safe Search feature on the Google.

III. LITERATURE REVIEW

A. Domain Name System

DNS is the addressing system for internet and one of fundamental things on the internet service. Mostly, all of the internet connected device (such as Computers, Laptop, Mobile devices, ATM) rely on DNS service to exchange information[4]. Special servers are used for DNS to translate or decode name such as www.verisign.inc into numerical address that allow the data and information reach their destinations. All of internet application, such as websites, email, social networks, and online banking to Voice over IP, file sharing, and video on demand, rely on the accuracy and integrity of this translations[5].

Fig. 1. DNS Schema.

B. Recursive Domain Name System

Recursive DNS, as on its name, their function is to Repeat back to itself (Recursive). Recursive DNS will pass the client's request query to the Internet Service Provider's authoritative DNS, and then sending the DNS query to the name server that asks for the domain and repeat again until the last name server[6].

Fig. 2. Recursive DNS Schema.

C. Unbound

Unbound is a service to validate, recursive, and caching DNS Resolver[7]. Unbound was designed to be fast and combining modern features based on open standards. Unbound supports DNS-over-TLS that allows the client to encrypt their communications. In additional, unbound supports many modern standards that will limit their data exchange to the authoritative servers. This standards does not only enhance client's privacy, but also helps DNS to be stronger. What matters are minimalized query name, aggressive use of DNSSEC-Validated Cache and support for Authority Zones, that can create a copy from root name server. Unbound runs on FreeBSD, OpenBSD, NetBSD, MacOS, Linux and Microsoft Windows.

D. FreeBSD

FreeBSD is a multiplatform Operating System that focused to features, speed and stability. FreeBSD is the derivative version of BSD, UNIX version that developed in the University of California, Berkeley. FreeBSD also developed and treated by many communities around the world. FreeBSD offer networks advanced feature, high performance, security and compatibility that are not found on other Operating System[8].

IV. IMPLEMENTATION AND ANALYSIS

After the literatures are gathered, in this paper implement two servers for the system. One server used to create configuration files that transferred to the second master server. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper.

Fig. 3. Implemented Network Topology.

In this newly created, update and upgrade the FreeBSD to the latest repository. Log on to the Recursive DNS 1 and give the IP address 172.31.254.238.

A. Upgrade and Update OS

After logged on to the server, open terminal, then enter this command into the terminal:

```
#portsnap fetch update && upgrade -a
```

This update and upgrade process rely on internet connection, if the internet speed was fast, the process will run faster.

B. Install and Configure the Unbound

After updating, the Unbound directory can be found on:

```
#/usr/ports/dns/unbound
```

And then start the setup

```
#unbound-control-setup
```

To configure the unbound, first thing to do is to backup the original backup files, and then start configure the configuration files to match the expectation.

C. Activating Safe Search

Create new conf file, in this paper using forcegoogle.conf that contains all google address names and forward it to safe search's IP address.

D. Analysis

19 From 20 keywords given both implicit and explicit keywords successfully filtered and not displayed in the search results.

TABLE I. FILTERING SUCCESS TABLE

No.	Keyword	Filtered	Not Filtered
1	Asianporn	√	-
2	Porn	√	-
3	Sex	√	-
4	Xxx	√	-
5	Porno	√	-
6	Bokep	√	-
7	Adult video	√	-
8	Jav	-	√
9	Tits	√	-

10	Boobs	√	-
11	18+	√	-
12	18+ Video	√	-
13	Sekretaris Nakal	√	-
14	Desahan	-	√
15	Fake Taxi	√	-
16	Fake Agent	√	-
17	Petite Russian	√	-
18	Sikwap	√	-
19	Naughty America	√	-
20	Narutoxxx	√	-

Fig. 4. Filtering Success Table.

On the result, 19 out of 20 keywords have successfully filtered, so the search results doesn't show any negative contents. This happens because the Google safesearch sistematically filters the name of website based on the keyword, not the contents from the website.

V. SUMMARY

From the test result of the implemented system, there's some conclusions:

1. DNS server configuration using Unbound, can also supports the routing process through record that added on the configuration files.
2. When activate the Safe Search, could filter the negative contents 19 out of 20 tested keywords. From this paper, the safesearch success rate were 95%.

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