

ITONK - DNS Report

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Abstract

Contents

Chapter 1

Introduction

The introduction of the Internet heralded an entirely new way of communication between humans. At an extreme pace, we are moving towards a world where every human being has access to an internet connection, to a point where several humanitarians and philanthropists perceive internet access as a big part of the solution towards poverty and human rights abuses.

But what binds this enormous web of people together? How do we 'find' each other on the World Wide Web?

This report will give an in-depth description of the Domain Name System (DNS), the technology responsible for translating *names* to *addresses*, making it possible to type in a human-readable domain name into a browser and have it translated to the specific address of a web server, anywhere in the world.

DNS servers act as the way-signs of the internet, directing the end user to the address of a desired server/domain. Thus, the end user really only needs to know the address of a DNS server, that can point him further in the right direction.

The report will focus on the technology from the case of a kindergarten teacher, Uffe, in need of setting up better DNS forwarding.

This is relevant because it shows a real life application of setting up a local DNS server with the BIND software. The actual tangible results of caching and forwarding to the optimal DNS server are shown in the results section.

The report is structured thus

1. Description of DNS
2. The role of DNS in the real-life case
3. Prototyping with BIND
4. Perspective and conclusion

As to first give a description of the basic theory before diving into a real-life application. To get an idea of the role of DNS, a section describing the role of the technology in the scope of the case is included before diving into the nitty gritty details of setting up a DNS server.

Chapter 2

Domain Name System

2.1 Overview

2.2 IP Addressing

To understand DNS, you must understand IP addresses! [Altså Excercise 1!] Helt overordnet, hvad er det?

2.3 Name Resolution and forwarding

Hvad er formålet med name resolution? Hvad gør det? Hvad får vi ud af det?

2.3.1 Iterative

2.3.2 Recursive

2.3.3 Caching

2.3.4 Security

2.4 BIND

2.4.1 Downloading

2.4.2 Configuration

2.4.3 Basic Use

Chapter 3

[Case Name]

3.1 Description

This is a brief description of the case, chosen to illustrate the possibilities and challenges of setting up your own DNS server.

The case is a kindergarten in Hellerup, Denmark has chosen to buy every third child an iPad Air 128 GB Wifi model. The rest of the kids get an Android Nexus 10, 32 GB Wifi model. Everything is going great until Christian, a 3 year old, gets fed up with absurdly long loading times. Christian checks out Google namebench and notices that all his DNS lookups take more than 100 ms!

Christian takes Uffe, the kindergarten teacher, by the hand and informs him of the problem. Uffe quickly realises, that the DNS lookup times could benefit from going to a more appropriate DNS server. To solve this problem for ALL the children, Uffe must find an appropriate DNS server, configure a local DNS server to forward to this server and configure the local DNS server for optimal caching.

3.2 DNS in [Case]

3.3 Requirements

Chapter 4

Prototyping in [Case]

4.1 System description

UML Diagrams etc.

4.2 BIND DNS server

4.3 Setup of BIND server

4.3.1 Choose DNS server to forward to

Using namebench etc.

4.4 Tests

RTT before and after/with without caching.

4.5 Results

Chapter 5

Conclusion

Approximately 1-2 pages covering conclusion, discussion, and perspectives.

5.1 Conclusion

Conclude on your investigations.

5.2 Discussion

Discuss your project work.

5.3 Perspectives

What are the perspectives on the technology and your prototype?

Bibliography

- [1] R.L. Graham, D.E. Knuth, and O. Patashnik, *Concrete mathematics*, Addison-Wesley, Reading, MA, 1989.
- [2] H. Simpson, *Proof of the Riemann Hypothesis*, preprint (2003), available at <http://www.math.drofnats.edu/riemann.ps>.