Assignment One

Tools

Set: *22th of April 2014*
Due: *2nd of May 2014 @ 23:55 CEST*

Synopsis:
Experiment with networking tools and basic network topology

Introduction

This is the first of four assignments in the *Datanet* course. The assignments are pratical in nature, and will give you you a hands-on approach to some of the technology that we all use and depend on as a part of our daily life.

In this first assignment, you are not required to program anything, but you need to try out some real word tools. If you do not have a laptop where these can be installed, you may consider using an Amazon EC2 instance. Installing and understanding these tools is part of the assignment, even if it is not explicitly mentioned.

Some of the tools useds in this assignment can help you when you solve the next assignments, so I encourage you to read all four assignments before starting on this assignment.

The assignment may be solved in groups, and I encourage you to do so, but each student must hand in an individual report on Absalon.

Assignment

Latency and Bandwidth

In the Resources section below you will find URLs for the Debian mirror list from which you should select some geographically separate servers which you will test and report numbers on. You should select at least five different mirrors.

Using tools such as `ping`, `traceroute`, `wget` you must measure the topology, bandwidth and latency properties of the network between your host and the debian mirrors. If you have other tools that serve a similar purpose, feel free to use those instead.

After performing the experiments you must describe which hosts you would select for different load scenarios and why. You should also explain how the bandwidth and latency properties are connected, and how this relates to the routes in the network.

HTTP Protocol

Using a tool such as `Wireshark`, you must examine the data transmitted over a network connection. Close all open browser windows, then open `Wireshark` and start listening. Open the browser, clear the browser cache and visit the DIKU homepage, while capturing the traffic with `Wireshark`. Save this trace to a file, and then start a new trace, again visiting the DIKU homepage. Then save this trace and compare the two traces, and describe your findings. Some of the things you should notice is the number of requests, the HTTP headers and the order of requests.

Your Report

You are encouraged to work in informal groups for this assignment, for the purpose of discussing implementation details and limitations. We strongly encouraged you to come to the exercise classes, where we will use time to discuss the design, implementation etc. The implementation and report that you hand in must however be **your own individual work**.

Your report *MUST* be written in ACM format. An ACM template for LaTeXand Microsoft Word is available for download via Absalon.

Your reports should contain:

- no more than a one page discussion of your test setup and tools
- indication of your test host's location and the mirrors that you are testing
- measurements of bandwidth and latency between your host and your selected mirrors
- indication of the route to at least two of the mirrors and a discussion of the impact that the route might be having
- no more than a one page discussion on latency and bandwidth
- no more than one page describing the similarities and differences of the Wireshark traces

Resources

The DIKU homepage can be found at `http://www.diku.dk`.

The Debian mirror list is available at `http://www.debian.org/mirror/list` or as text file (which is probably easier to parse) at `http://anonscm.debian.org/viewvc/webwml/webwml/english/mirror/Mirrors.masterlist?view=co`.

Please be nice to the Debian mirrors and try not to download excessively large amounts of unnecessary things!

Handing In Your Assignment

You will be handing this assignment in using Absalon. Try not to hand in your files at the very last-minute, in case the rest of the Datanet students stage a DDoS attack on Absalon at the exact moment you are trying to submit. **Do not email us your assignments**.

General Notes

- Submit your documents as PDFs. No Word, OpenOffice, LaTeX, or PostScript files.
- You can submit your work either in Danish or in English. If you do submit your work in English you are likely to get any comments back in English as well.
- Absalon allows you to attach any number of files to your submission. Do not compress your PDF.

Assessment

The assignment will be scored on a scale of 0-10 points. There will be **no re-submission** for this assignment. In order to participate in the exam, you must obtain a total of 24 points over the four assignments.