



4th Work Sheet Internet Measurement SS 08

Question 1: Review A Measurement Study

Read and understand the measurement study at http://www/teaching/ss08/IM_lecture/study/study.pdf¹ and comment on it. Describe what you think about the study. Is their methodology described accurately? Are there weak points in the methodology? Do they describe the placement and selection of their measurement points? Does the selection of measurement points make sense? Is there enough information in the study to convince you? Is there anything that you would do in a different way? What? Why?

Question 2: An Active Measurement Experiment

Determine two IP addresses of www.google.com. You can use `nslookup` under Windows, or `dig` under Linux. Measure the roundtrip time² and the number of hops³ from one measurement point (e.g., your home DSL access or a university computer). Is there a significant difference in roundtrip time and number of hops to the different IPs. Describe and report on your results and also supply all the raw measurement data you acquired.

Question 3: Designing an Experiment

Your goal in this exercise is to elaborate on how to design an experiment for studying the performance of an IPTV system. Assume that you have a testlab in which you can configure a random topology with up to 100 IPTV clients. You can use one or more IPTV servers in your setup. Furthermore you can configure arbitrary delays and packet drops in the topology. You want to determine where in the network to place the IPTV servers and how many servers you need to provide sufficient service quality to the client.

You can assume the following:

- There are 100 TV channels, users tend to change between channels often (i.e., some users switch channels every couple of seconds).
- When a user watches a channel, the data stream for this channel is sent from the server to the user. If several users watch a channel, the server has to send a separate stream to each user (Note that a good IP Server would use a multicast approach, but for our example the above is fine).
- Users want good picture quality without missing frames.
- Users want a fast response, e.g., when switching a channel

You do not have to describe the setup in detail, your goal is simply to answer the following two questions: What are the factors that *could* influence service quality? How can you find out which factors are the important ones?

Submission Details:

Due Date: June 16th 2008, 10:00 c.t. (just before the lecture) Submission in paper form. I.e., write everything down and print it out.

¹Password protected. Password will be given during the lecture, only accessible from a computer at TU Berlin

²you can use `ping`

³use `tracert` under Linux, `tracert` under Windows