ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

**Distributed
Computing**

FS 2016   Prof. R. Wattenhofer

Computer Engineering II
Exercise Sheet 3

We categorize questions into four different categories:

Quiz Short questions which we will solve rather interactively at the start of the exercise sessions.

Basic Improve the basic understanding of the lecture material.

Advanced Test your ability to work with the lecture content. This is the typical style of questions which appear in the exam.

Mastery Beyond the essentials, more interesting, but also more challenging. These questions are **optional**, and we do not expect you to solve such exercises during the exam.

Quiz ──

1 Quiz Questions

a) How are users authenticated in modern websites?

b) Why are two separate ports used for encrypted and unencrypted versions of a protocol?

c) Does the sender of a mail always contact the destination mailserver directly?

d) Does using an ISP provided DNS server reduce resolution time?

e) When opening `http://google.ch` in a modern browser, multiple connections to host 195.176.255.251 will be opened. Why?

Basic ──

2 Send me a comment

We have created a website on which users can leave comments on the lecture. It is currently hosted on the server `pc-10367.ethz.ch` and can be accessed using HTTP on the default port.

In this exercise we will make extensive use of the telnet client. The telnet protocol was a simple protocol that allowed the remote access to a Unix terminal with minimal overhead. While the telnet protocol is no longer in use, being unencrypted and insecure, it remains a popular tool to experiment with human readable protocols since it simply opens a TCP connection and accepts input which is then transferred over the raw TCP connection and also accepts incoming data and prints it on screen. We suggest to either use the `telnet` command or the `netcat` client on Linux, or PuTTY on windows. Due to a difference in what constitutes a newline in various

operating systems, please make sure that the client is configured to send both a carriage return (CR) and a line feed (LF). This should already be the case with `telnet`, `netcat` might require the `-C` option, and PuTTY requires the options *Implicit CR in every LF* and *Implicit LF in every CR* to be enabled. Also make sure to use the `Raw` connection type in PuTTY.

a) Visit the website with your browser and try to explain what is happening in the background in order to display the page. Most modern browsers have developer tools to inspect the currently loaded page and trace the HTTP requests that the browser issued. In Firefox and Google Chrome the developer tools can be opened pressing `Ctrl+Shift+I`. Make sure to have the developer tools open while loading the page, otherwise the request trace may be incomplete.

b) Now retrieve the HTML page with telnet, by connecting to port 80 on the server and issuing an HTTP request manually.

c) The website is not yet fully functional, e.g., it does not have a form to enter new comments, however the server already accepts new comments if they are sent to the `/` path using the `PUT` method. Use telnet to add a new comment to the page.

3   Send me a mail

A website may have many interfaces and interact with any number of services. To give our users more flexibility we also accept mail messages. The mail server is using SMTP on port 25 on the same server as the website.

a) Using a mail client to send mails to `somebody@pc-10367.ethz.ch` will not work, can you guess why?

b) Use telnet and connect to the SMTP port to send us a comment.