Electronics and
Computer Science

UNIVERSITY OF
Southampton

COMP3220 Laboratory Notes

Lab 1: HTTP

This computer-based laboratory is designed to give you practical experience of constructing HTTP requests and interpreting HTTP responses. As part of this lab, you will investigate the verbs offered by HTTP, and the behaviour of key HTTP headers. This laboratory is not assessed.

Tools

In order to complete this laboratory, you will need to use the following tools. You should familiarise yourself with their man pages.

netcat

Netcat is a command line tool that enables the reading and writing of data using TCP. On uglogin, the netcat binary is /usr/bin/nc. Below is an example of an HTTP request being sent using netcat – note the carriage return on a line by itself that marks the end of the request.

```
$ nc www.ecs.soton.ac.uk 80
GET / HTTP/1.1
Host: www.ecs.soton.ac.uk
<return>
```

Note that some servers will close the connection if a well-formed request is not received within a very short period (en.wikipedia.org, for example). For these servers, you can send the request in one go (rather than a character at a time) as follows (the '?' is a shell prompt, and should not be typed):

```
$ nc www.ecs.soton.ac.uk 80 << EOF
? GET / HTTP/1.1
? Host: www.ecs.soton.ac.uk
?
? EOF
```

telnet

Telnet is a command line tool that can be used to read and write data via TCP and the telnet protocol. For some hosts (most notably www.debian.org), telnet should be used instead of nc. On uglogin, the telnet binary is /usr/bin/telnet

```
$ telnet www.ecs.soton.ac.uk 80
GET / HTTP/1.1
Host: www.ecs.soton.ac.uk
<return>
```

cURL

cURL is a command line tool that allows the transfer of data using various protocols (including HTTP). On uglogin, the cURL binary is /usr/bin/curl

The -v flag will display the whole request that was sent and the headers that were received. You should use this flag for the exercises below.

```
$ url -v http://en.wikipedia.org/
```

The -L flag will follow 3xx redirects:

```
$ curl -v -L http://en.wikipedia.org/
```

The -H flag allows the sending of arbitrary headers. In the example below, sending a User-Agent header claiming to be a mobile device triggers the sending of mobile-friendly sites for some websites – try it on the exercises below.

```
curl -v -H "User-Agent: Mozilla/5.0 (Linux; <Android Version> <Build Tag etc.>)
AppleWebKit/<WebKit Rev> (KHTML, like Gecko) Chrome/<Chrome Rev> Mobile Safari/<WebKit
Rev>" -L http://en.wikipedia.org/
```

Exercises

In the following exercises, you will be constructing HTTP requests by hand using netcat and telnet. For each exercise, you should make a note of the method and headers that you send, and the status code and headers that you receive.

We recommend that you attempt these exercises from uglogin.

1. Retrieve a representation of http://www.ecs.soton.ac.uk/
2. Retrieve a representation of http://en.wikipedia.org/
3. Retrieve a representation of http://www.debian.org/
4. Retrieve a representation of http://www.ecs.soton.ac.uk/frotz
5. Retrieve a representation of http://google.com/
6. Retrieve a representation of http://www.google.co.uk/
7. List the methods that are supported by http://www.google.co.uk/
8. Delete http://www.ecs.soton.ac.uk/
9. Create a new resource http://www.ecs.soton.ac.uk/frotz
10. Retrieve a representation of http://www.debian.org/ in British English
11. Retrieve a representation of http://www.debian.org/ in German
12. Retrieve a representation of https://www.google.com/teapot (you will need to use cURL -v for this)
13. Retrieve a representation of http://id.southampton.ac.uk/building/59
14. Retrieve a representation of http://data.southampton.ac.uk/building/59
15. Retrieve a representation of http://data.southampton.ac.uk/building/59 in application/rdf+xml format

References

Hypertext Transfer Protocol – HTTP/1.1 – Semantics and Content
http://tools.ietf.org/html/rfc7231