

ECE 465: Computer Network Protocols and Applications
Homework 4
Solution
Dr. Paris

Chapter 2 Review Questions

8. There are no good examples of an application that requires no data loss and timing. If you know of one, send an e-mail to the authors.

9. A protocol uses handshaking if the two communicating entities first exchange control packets before sending data to each other. SMTP uses handshaking at the application layer whereas HTTP does not.

Chapter 2 Problems

Problem 6.

The total amount of time to get the IP address is

$$RTT_1 + RTT_2 + \cdots + RTT_n.$$

Once the IP address is known, RTT_o elapses to set up the TCP connection and another RTT_o elapses to request and receive the small object. The total response time is

$$2RTT_o + RTT_1 + RTT_2 + \cdots + RTT_n$$

Problem 8.

HTTP/1.0: GET, POST, HEAD.

HTTP/1.1: GET, POST, HEAD, OPTIONS, PUT, DELETE, TRACE, CONNECT.

See RFCs for explanations.

Experiments

1. Post to a form:

a.) Establish telnet connection

```
$ telnet thalia.spec.gmu.edu 80
```

```
Trying 129.174.135.24...
```

```
Connected to thalia.spec.gmu.edu.
```

```
Escape character is '^['.
```

b) Issue HTTP/1.1 POST command. The Content-Length field indicates that a body is to follow:

```
POST /~pparis/test.cgi HTTP/1.1
Host: thalia.spec.gmu.edu
Content-Length: 9
```

name=Bobo

c) Response from server:

```
HTTP/1.1 200 OK
Date: Mon, 03 Mar 2003 20:41:45 GMT
Server: Apache/1.3.3 (Unix)
Transfer-Encoding: chunked
Content-Type: text/html
```

a4

```
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML//EN">
<HTML><HEAD><TITLE>ECE 465 Form Example</TITLE>
</HEAD><BODY><H1>ECE      465      Form      Example</H1>Hello
<EM>Bobo</EM>!<P><HR>
```

2. Password authentication:

a) telnet to server:

```
$ telnet thalia.spec.gmu.edu 80
Trying 129.174.135.24...
Connected to thalia.spec.gmu.edu.
Escape character is '^['.
```

b) send request to server. The Authorization header includes the base-64 encoded string "Aladdin:open sesame" (QWxhZGRpbjpvYVUyIHNlc2FtZQ==)

```
GET /~pparis/secret/secret.html HTTP/1.1
Host: thalia.spec.gmu.edu
Authorization: Basic QWxhZGRpbjpvYVUyIHNlc2FtZQ==
```

c) server response:

```
HTTP/1.1 200 OK
Date: Mon, 03 Mar 2003 20:50:30 GMT
Server: Apache/1.3.3 (Unix)
Last-Modified: Wed, 12 Feb 2003 15:27:57 GMT
ETag: "2848ac3-fd-3e4a67fd"
Accept-Ranges: bytes
Content-Length: 253
Content-Type: text/html
```

```
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML//EN">
<html> <head>
<title>TOP Secret</title>
</head>
```

```
<body>
<h1>TOP SECRET</h1>
```

<p>A very secret file.

<hr>

<!-- hhmts start -->

Last modified: Wed Feb 12 12:31:57 EST 2003

<!-- hhmts end -->

</body> </html>