

CPSC 441
COMPUTER COMMUNICATIONS
QUIZ

Department of Computer Science
University of Calgary
Professor: Carey Williamson

February 7, 2014

This is a CLOSED BOOK in-class quiz. Textbooks, notes, laptops, personal digital assistants, and cellular phones are NOT allowed. However, **calculators are permitted**.

It is a 20-minute quiz, with a total of 32 marks. There are 5 questions, and 5 pages (including this cover page). Please read each question carefully, and write your answers legibly in the space provided. Good luck!

Student Name: _____

Score: _____ / 32 = _____ %

----- Privacy Fold Here -----

Student ID: _____

Network Terminology

- 6 1. In our introductory material on networking terminology, we discussed a “component-based” view of the Internet. The three main components were **Hosts**, **Links**, and **Routers**. **Give a clear and concise description** of what each of these components are.

(a) (2 marks) Hosts:

(b) (2 marks) Links:

(c) (2 marks) Routers:

Networking Delays

- 8 2. There are four different types of “delay” that packets undergo when transiting the Internet. **List and describe** each of these delays, making sure to indicate where and how each type of delay occurs.

1. (2 marks)

2. (2 marks)

3. (2 marks)

4. (2 marks)

Application-Layer Protocols

- 6 3. Among the application-layer protocols that we studied, several can be used for the generic transfer of “files” in a client-server fashion. Three of these are FTP, SMTP, and HTTP. **Compare and contrast** these three protocols, based on their design characteristics, properties, assumptions, or implementation details. Point form is sufficient, but please make sure to state **at least 4 relevant points for each** of these 3 protocols.

FTP (File Transfer Protocol)	SMTP (Simple Mail Transfer Protocol)	HTTP (Hyper-Text Transfer Protocol)

Calculation

- 6 4. A friend of yours in rural Alberta would like to download a copy of *Lord of the Rings* from you in Calgary. Unfortunately, they only have a dialup modem with a capacity of 128 kbps. Recall that the file size is 430 MB, and your server link speed is 2.0 Mbps. Focusing on transmission time only, and assuming 100% utilization of their bottleneck link, **how long** would it take for your friend to download this movie? Would it be faster for you to drive there yourself (6 hours) with the DVD? If so, by how much? **Show your work.**

Domain Name System

- 6 5. The attached page shows the output of some `nslookup` and `dig` commands for some recent DNS queries. Use your knowledge of DNS to **answer the following questions**:
- (a) (1 mark) What is the **full domain name** of the computer on which the commands were typed and run?
 - (b) (1 mark) What is the name of the computer whose IP address was being queried?
 - (c) (1 mark) What is the IP address that was returned in response to this query?
 - (d) (1 mark) What is the IP address of the DNS server that answered the `nslookup` query?
 - (e) (1 mark) What is the IP address of the DNS server that answered the `dig` query?
 - (f) (1 mark) What is the IP address of the DNS server at UBC?

*** THE END ***

```
csg% date
Sat Feb  1 06:25:37 MST 2014
```

```
csg% hostname
csg
```

```
csg% nslookup
> cs.ubc.ca
Server:          136.159.5.75
Address:         136.159.5.75#53
```

```
Non-authoritative answer:
Name:   cs.ubc.ca
Address: 142.103.6.5
```

```
csg% dig @access.usask.ca cs.ubc.ca
```

```
; <<>> DiG 9.3.4-P1 <<>> @access.usask.ca cs.ubc.ca
; (1 server found)
;; global options: printcmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 1880
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 2, ADDITIONAL: 2

;; QUESTION SECTION:
;cs.ubc.ca.                IN      A

;; AUTHORITY SECTION:
ubc.ca.                    77550   IN      NS      dns3.ubc.ca.
ubc.ca.                    77550   IN      NS      hub.ubc.ca.

;; ADDITIONAL SECTION:
dns3.ubc.ca.              70534   IN      A       142.103.1.1
hub.ubc.ca.               31648   IN      A       137.82.1.1

;; Query time: 12 msec
;; SERVER: 128.233.3.1#53(128.233.3.1)
;; WHEN: Sat Feb  1 06:26:59 2014
;; MSG SIZE rcvd: 102
```

```
csg% date
Sat Feb  1 06:28:12 MST 2014
```