

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

Friday Decembet 5, 2008 (3:15 PM to 6:00 PM), 330 Science Building

Note:

1. Write your name and GT number on each page.
2. The test is **CLOSED BOOK** and **NOTES**.
3. Please provide the answers in the space provided. You can use scratch paper (provided by us) to figure things out (if needed) but you get credit **only** for what you put down in the space provided for each answer.
4. For conceptual questions, **concise bullets** (not wordy sentences) are preferred.
5. Where appropriate **use figures** to convey your points (a figure is worth a thousand words!)
6. **Illegible answers are wrong answers. WE MEAN IT!!**
7. Please look through the whole test before starting so that you can manage your time better.

Good luck!

Question number	Points earned	Running total
1 (Max: 1 pts)		
2 (Max: 12 pts)		
3 (Max: 8 pts)		
4 (Max: 8 pts)		
5 (Max: 16 pts)		
6 (Max: 12 pts)		
7 (Max: 10 pts)		
8 (Max: 8 pts)		
9 (Max: 5 pts)		
10 (Max: 10 pts)		
11 (Max: 10 pts)		
Total(Max: 100 pts)		

1. (1 min, 1 point)

Write the full name of your professor for this course in some language other than English.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

2. (15 min, 12 points) (Distributed Objects - Java, Spring Kernel)

Answer True/False and explain why that is the case (If you only say True or False you will not receive full credit.)

(a) Parameter passing for object invocation has the same semantics for local and remote objects in Java.

(b) Spring kernel requires all subsystems to be coded in the same programming language

(c) Client/server interaction in Spring is location transparent (i.e., the client and server do not know or care whether they are on the same or different nodes).

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

3. (10 min, 8 points) (Global Memory System)

Answer True/False and explain why that is the case (If you only say True or False you will not receive full credit.)

(a) The age information for the pages used by the virtual memory subsystem is readily available to the GMS.

(b) A node that is mostly inactive for a length of time becomes a remote memory server for the other nodes.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

4. (10 min, 8 points) (Distributed Shared Memory - TreadMarks)

Answer True/False and explain why that is the case (If you only say True or False you will not receive full credit.)

(a) Eager release consistency results in less latency for memory access compared to lazy release consistency.

(b) "False sharing" has no impact on memory access latency.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

5. (20 mins, 16 points) (xFS)

In a centralized file system, the server performs the functions of managing the data blocks, metadata for the files, server-side file cache, and consistency of datablocks of files cached by multiple clients. The following questions are with respect to how these functions are carried out in xFS.

Answer True/False and explain why that is the case (If you only say True or False you will not receive full credit.)

(a) Meta data for files are located in the same node as the data

(b) A file is contained entirely on a single disk in the entire system.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

(c) Small file write problem is solved in xFS.

(d) The in-memory cache for a file resides at the same node as the disk copy.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

6. (15 min, 12 points) (Rialto CPU)

Rialto scheduler provides two main mechanisms for guaranteeing CPU time for real-time jobs.

(a) **Reservation:** Give an example of an application scenario where this will be useful

(b) **Time constraint:** give an example of an application scenario where this will be useful

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

7. (10 min, 10 points) (Tiger)

With pictures show and explain the file layout for single bitrate files that ensures that failures of cubs can be tolerated without overloading the throughput capacity of each disk.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

8. (10 min, 8 points) (LRVM and Quicksilver)

Answer True/False and explain why that is the case (If you only say True or False you will not receive full credit.)

(a) LRVM is "lightweight" compared to Camelot.

(b) Quicksilver aborts a transaction immediately upon detecting failure.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

9. (10 min, 5 points) (Rio Vista)
(give your answers as bullet points)

(a) What are the sources of problems in computer systems that lead to failure as identified in this paper?

(b) How are these relaxed in Rio Vista?

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

10. (15 min, 10 points) (Coral)

If \mathbf{k} is the key and \mathbf{n} is the node id, a traditional DHT would try to store \mathbf{k} at a location \mathbf{n} , where \mathbf{n} is equal to \mathbf{k} .

(a) Explain why DSHT does not do that.

(b) Explain how the "put" algorithm of Coral works.

CS 6210 Fall 2008 Final

Name: _____ GT Number: _____

11. (10 min, 10 points) (Security issues)

Explain two attributes that are novel about the way security issues are addressed in the Andrew distributed file system (**give your answer as bullet points**).