## CMSC 417 Computer Networks

Fall 2003

## Final Exam

Closed book and notes; In class

Thursday, December 18th

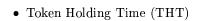
- $\oplus$  Do not forget to write your name on the first page. Initial each subsequent page.
- $\oplus$  Be neat and precise. I will not grade answers I cannot read.
- $\oplus$  You should draw simple figures if you think it will make your answers clearer.
- $\oplus$  Good luck and remember, brevity is the soul of wit
- All problems are mandatory
- I cannot stress this point enough: **Be precise**. If you have written something incorrect along with the correct answer, you should **not** expect to get all the points. I will grade based upon what you **wrote**, not what you **meant**.
- Maximum possible points: 60.

Name:		
name:		

Problem	Points
1	
2	
3	
4	
5	
6	
Total	

## 1. General

` '	Please give a precise would help (2 points	for the	following terms.	Give an	example	as well	if you	think it
	• p-persistence							



• CRC (cyclic redundancy check)

• Hidden node problem

• Exposed node problem

2.	IP a	ddressing and routing
	(a)	Does BGP have to be aware of CIDR address blocks? Why or why not? (3 points)
	(b)	State one advantage and one disadvantage of distance vector routing (over link state routing). (2 points)
	(c)	How does PIM-SM solve the problems of DVMRP? (5 points)

3.	Transport, MAC
	(a) Can a reliable transport protocol be built using only $NAKs$ ? Explain (2 points)
	(b) Can a TCP still send data after one-side has sent a FIN? (3 points)

•	Mor	re MAC, and app	olication-layer p	rotocols				
	(a)	What are data path? (3 points		rmally mana	ged by FTP?	What about if	there is a NAT	on the
	(1.)	<i></i>	<b>60</b>	d Ed			1	,
	(b)	Token rings are	e more efficient	than Etherne	et under high	loads. Why or w	hy not? (3 point	ss)
	(c)	Does a HTTP points)	proxy have to	know if persi	stent connect	ions are in use?	Why or why n	ot? (4

5.	Adv	anced topics: P2P and traceback
	(a)	What is the expected number of hops before it is known that an item is $not$ in a Pastry network? Please provide a simple explanation for your answer. (2 points)
	(b)	Why can't an attacker $fake$ information when the $edge\text{-}marking$ algorithm is used for IP traceback? (3 points)
	(c)	The edge marking algorithm paper eventually uses the IP identification field for carrying edge information. What are the potential problems with such an approach. Hint: consider what happens if the marking happens before (and after) the fragmentation. (5 points)

## 6. Design

(a) The "Slashdot Effect" is a colloquial term which describes overload on servers that host popular pages (e.g. pages that have recently been referenced on www.slashdot.org). The slashdot effect is also apparant for popular large files, e.g. a new version of a browser, a new security patch, or a new version of an OS. Devise a protocol for handling such short busty load spikes for large files. If your solution works, then the expected download time for popular files will not increase appreciably even if the number of users downloading these files increase by several orders of magnitude.

Clearly, I don't expect you to come up with a complete protocol spec.; instead, you should try to explore a single idea that might work. You must be precise about your assumptions and describe the shortcomings (if any) of your solution. (10 points)