

UNIVERSITY OF GLAMORGAN

Prifysgol Morgannwg

Examinations: MAIN SESSION 2006/2007		
Validated Module Code: SY3S02	Validated Module Title: Computer Networks	
Date	Time	Duration: 3 hours

Open/Closed Book	Closed	<u>And</u>	Rubric checked	yes
Duration checked	yes	<u>And</u>	Questions checked	yes
Attachments checked	yes	<u>And</u>	Amendments checked	yes

I confirm that the attached paper is accurate, complete and appropriate for use in the examination room, includes all necessary attachments relevant to the examination and that all attached papers and documents are of a quality ready for photocopying.

Module Leader:	Print Name: G Mulley [JGH]	Signature:
Admin Check:	Print Name:	Signature:
Contact Number:	x3622	

FOR ADMINISTRATIVE CHECK ONLY

UNIVERSITY OF GLAMORGAN
Prifysgol Morgannwg

Examinations: MAIN SESSION 2006/2007		
Validated Module Code: SY3S02	Validated Module Title: Computer Networks	
Date	Time	Duration: 3 hours

The following items are provided:

Examination book (inc 2 sheets graph paper)

Instructions to Candidates:

This examination paper is a closed book examination.

You should answer any 5 questions.

All questions carry equal marks.

This paper consists of a total of 8 examination questions.

Question 1

- (a) “Network protocols are intrinsically related to operating systems”. Critically appraise this statement in relation to the LTSP project.
(12 marks)
- (b) Comment on the suitability of LTSP in an office and University laboratory environment.
(8 marks)

Question 2

- (a) “A firewall is more than a port filter”, discuss and justify this statement. You should include a suitable network diagram which includes your firewall.
(12 marks)
- (b) What facilities does the `iptables` tool offer an administrator?
(8 marks)

Question 3

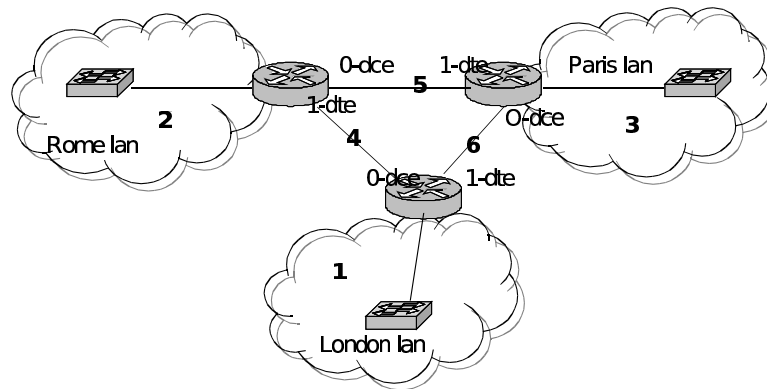
- “Tunneling IP over DNS will be one of the biggest security problems of the future”, discuss.
(20 marks)

Question 4

- (a) What rules, according to Tanenbaum, are key to achieving higher performance from the ISO OSI services of layers 2, 3 and 4?
(10 marks)
- (b) Critically appraise WEP as a secure protocol.
(10 marks)

Question 5

- (a) The intranet of 6 networks shown below need IP allocation by subnetting the single public class C network: 192.100.100.0



You are required to subnet this network such that networks 1,2 and 3 need to support 12 hosts, and that networks 4,5 and 6, need to support 2 hosts. In this part of the question all 6 networks should have the same subnetting structure.

Explain your rationale for your subnetting scheme chosen, and demonstrate your understanding by giving for 2 PCs in both the Paris and Rome networks:

- the ip number
- subnet mask
- broadcast address
- gateway address

(12 marks)

- (b) The subnetting in the first part of this question is inefficient in that networks such as 4,5 and 6, will normally only have 2 hosts. Show how variable length subnetting (VLSM) can eliminate this inefficiency.

(8 marks)

Question 6

- (a) What is a switch, and how does such a device work when only used for switching?
(4 marks)
- (b) What benefits can a network designer gain by using switches to segment a large network into an intranet of smaller networks?
(4 marks)
- (c) Show how VLANs can be implemented on a switch, this to include:
allocation of hosts to VLANs
connection of switches to routers
the need for a trunking protocol
(12 marks)

Question 7

- (a) Analyse the various switching options available on the wide area network, including for each option, technical characteristics such as its logic and bandwidth, and also the sort of application each option is used for.
(10 marks)
- (b) Performance criteria for a wide area link could include measures such as bandwidth, latency and jitter. Define each of these measures, and use a table to show applications that require weak, medium, and strong values for these measures.
(10 marks)

Question 8

Make notes and diagrams on layers 2,3 and 4 of the ISO OSI-7 layered protocols, this to include:

The functionality of these layers.

The protocol data unit (PDU) at each of these layers.

The encapsulation that occurs as data moves from higher layers to layer 4, then to layer 3 and then to layer 2.

(20 marks)
