

COMPUTER SCIENCE TRIPOS Part IB – 2013 – Paper 5

5 Computer Networking (AWM)

Here are four options for improving web page performance.

Option 1: HTTP Caching with a Forward Proxy

Option 2: CDN using DNS

Option 3: CDN using anycast

Option 4: CDN based on rewriting HTML URLs

You have been asked to help reduce the costs for networking in the University.

- (a) The University pays its service provider *networks'r'us*, based on the bandwidth it uses; bandwidth use is dominated by students downloading external web pages. Which, if any, of the above four options would reduce the bandwidth usage?

Explain your choice. [4 marks]

- (b) The delivery of online courses has become a tremendous success – but this has led to a significant increase in network costs for the University.

You must select one of the options above to minimize load on the servers. Compare the operation of each option and justify a selection that provides the finest granularity of control over load to the content-servers and a selection that will serve each customer from the closest CDN server. [12 marks]

- (c) You have looked up the IP address of your favourite search engine on the University network and noticed the answer is different from that given to your friend when he did the lookup in Newfoundland, Canada.

For each option above, indicate why it might, or might not, be used by your favourite search engine to improve web page performance. [4 marks]