

Students to Discuss Solution: Web Caching (Week 2)

Consider the figure below for which there is an institutional network connected to the Internet. Suppose that the average object size is 900,000 bits and that the average request rate from the institution's browsers to the origin server is 1.5 requests per second. Suppose that the amount of time it takes from when the router on the Internet side of the access link forwards an HTTP request until it receives the response in two seconds on average. Model the total average response time as the sum of the average access delay and the average Internet delay. For the average access delay, use $A/(1-AB)$ where A is the average time required to send an object over the access link and B is the arrival rate of objects to the access link. You can assume that the HTTP request messages are negligibly small and thus create no traffic on the network or the access link.

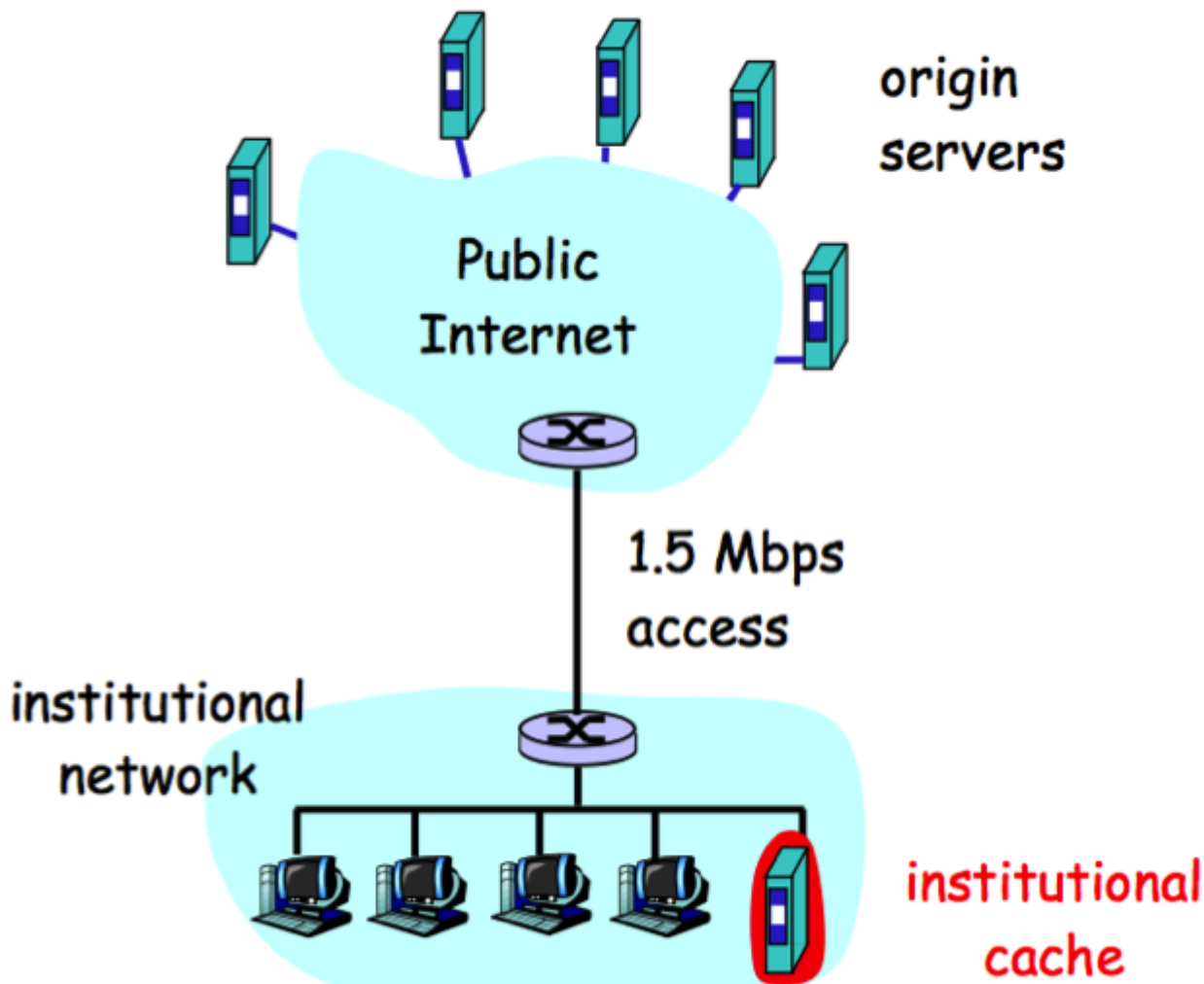


Figure 1: Figure for web cache problem

Question 1. Find the total average response time?

Question 2. Now suppose a cache is installed in the institutional LAN. Suppose the cache hit rate is 0.4. Find the total response time.