

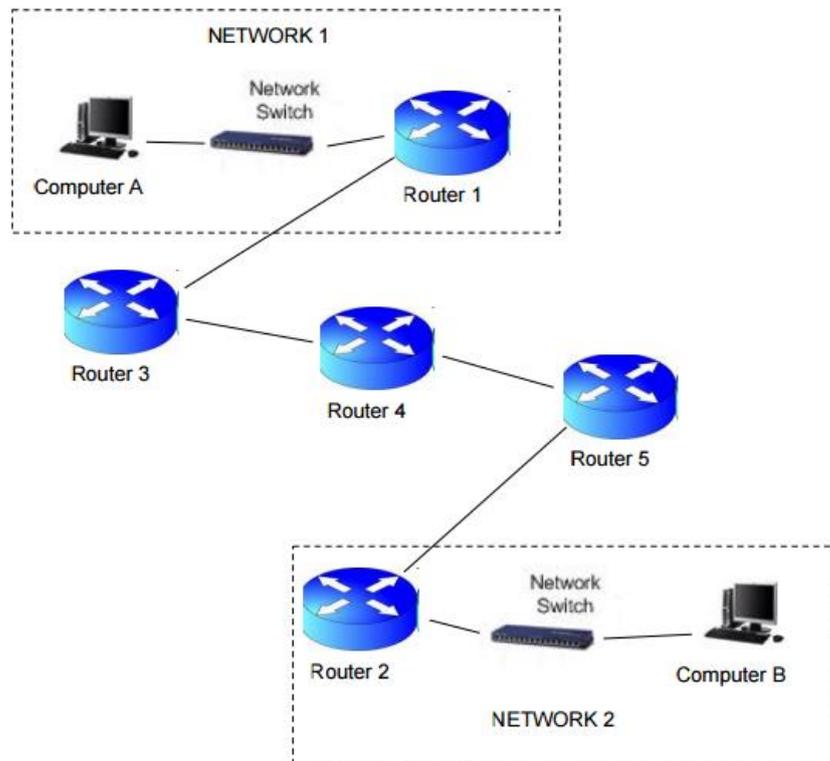
Question 1 – Network Stack

The essential qualities of any system are correctness, reliability, robustness and security, compatibility and scalability, ease of use, and efficiency.

Consider for each of these how the physical, data-link, and Internet layers contribute to these qualities and how the higher layers add these qualities to the lower layers.

Question 2 – A Day in the Life

You are an Internet messenger (a somewhat fictional entity, but it will make for an interesting story) who carries messages around the network. In the network below, a user turns on Computer A, starts a web browser, enters a URL to his favourite web site <http://www.widgetsrus.com>. The web browser asks you, the messenger, to carry a request to the web server and then carry a response back to the user. Your journey will take you into the caverns of the Internet as shown in the diagram below carrying the user's request. The server – at Computer B – warmly receives you and formulates a reply to the request which you transport back to the user at Computer A.



You should consider what happens at Computer A in the web browser, what happens to the message down through the stack layers, what happens to the message as it is sent across a wired Ethernet link. What does the switch do and which network layers are involved. What

do the routers do and which layers are involved at the routers. How do the switches and routers process (manipulate) the packets? What fields do they look at, and which fields are changed? You only need to report in detail your experience at router 1 and router 2 – it will be much the same for routers 3, 4, and 5

What happens to the message you are carrying at the web server on Computer B? How is the reply constructed and do you return it to the user in the reverse process. Where information is the same as in the outward journey, you need not repeat it.