

EE3009 Tutorial 3

(Protocol Layering, HTTP, TCP, UDP)

Review Questions

- What are the seven layers in the OSI model?
- What are the five layers in the Internet protocol model?

Problems

1. The French and Chinese prime ministers need to come to an agreement by telephone, but neither speaks the other's language. Further, neither has on hand a translator that can translate to the language of the other. However, both prime ministers have English translators on their staffs. Draw a diagram similar to a network protocol stack to depict the situation, and describe the interaction at each level.
2. Consider the following scenario: You click on a link in your web browser to obtain a web page. The web page associated with the link contains exactly one object. Suppose the IP address of the web server which stores the web page is known by your host. Let the RTT between the local host and the server containing the object be y msec., and the transmission delay of the object be t msec. How much time elapses from when the client clicks on the link until the client receives the object?
3. Use the RSA algorithm to encrypt the message m represented by the decimal number 32 with $p = 17$, $q = 5$, $e = 61$, and $d = 21$. Show your calculation of the ciphertext, c , and check your answer by decryption.

Computer Exercise (Marks will be given to this question)

4. In this exercise, you will use Packet Tracer to examine the packet exchange between a web client and a web server. Open the file "HTTP_TCP.pka", and follow the instructions.
 - a) Observe how a TCP connection is established. Why is it called "three-way handshake"?
 - b) The client sends an HTTP request to the server. What is the size (in bytes) of this request? (Ignore the TCP header.)
 - c) The server sends an HTTP response to the client. What is the size (in bytes) of this response? (Ignore the TCP header.)

Note: The answers to (b) and (c) can be found by observing the sequence numbers in some segments. **Briefly explain to your tutor how you obtain the answers to (b) and (c).**